

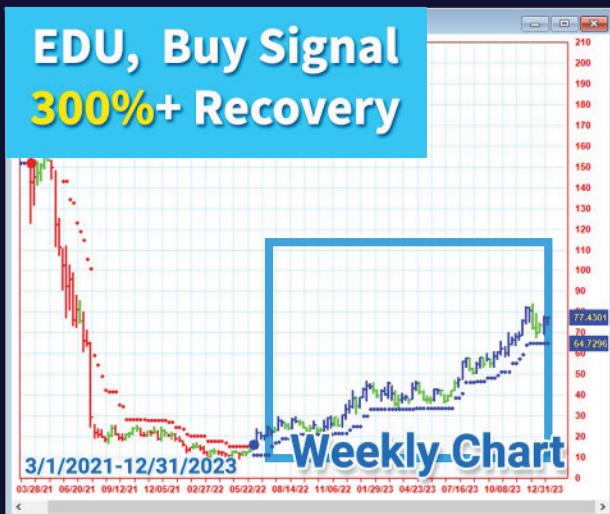
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### *Fixed Vs. Variable*

# Fixed Stop-Loss And Percentage Stop-Loss In Comparison

*Don't underestimate the importance of using stops in your trading. But which is better to use—a fixed or variable stop-loss? Here's a test to suggest which may work best.*

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*by Andrea Unger*

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**O**ne of the most important parameters of an automatic trading system, if not the most important, is undoubtedly the stop-loss. This is because it allows us to limit the maximum loss of a trade to a given value.

This value can be expressed in two different ways: as a fixed amount (for example, by setting it at \$1,000) or as a variable amount (for example, by expressing it as a percentage of recent prices on the market).

Here, I will show how to apply both types and compare them using a real trading strategy to thoroughly analyze the difference in results.

### **FIXED VS. VARIABLE STOP-LOSSES**

As an example, let's take the emini S&P 500 futures and look at the values from 2008 to today. It is apparent that the value of a contract has changed drastically over time. In the past, a contract was worth less than 1,000 points, and today it has exceeded 4,000 points.

So a futures move of 2% that occurred today is at least four times the monetary value of the same move that occurred 15 years ago. If we assume that a single point of the futures under consideration is worth \$50, we obtain the following:

- In 2023, 2% (about 80 points) would be worth \$4,000
- In 2008, the same 2% move (about 20 points) would have been worth \$1,000

It seems logical, therefore, to believe that a percentage stop-loss would be the best choice. Indeed, it would adjust better to the economic changes in the instrument

**TRADING TECHNIQUES**

over the years and respond immediately to impulsive market movements.

Problem solved? As always, when answering questions, we test different scenarios to compare them.

### TESTING FIXED VS. VARIABLE STOP-LOSSES ON A TRADING STRATEGY

For testing, let's take a strategy that we have used live for some time and that was developed for the futures in question with a 5-minute timeframe and using data from 2008 to the present.

It is a multiday strategy initially developed with a fixed monetary stop-loss of \$1,100, but we want to set a percentage stop-loss to see if the system would benefit.

In EasyLanguage, a fixed stop-loss is expressed by this condition:

```
setstoploss(1100);
```

Meanwhile, a variable (percentage-based) stop-loss could be expressed in EasyLanguage by the following condition:

```
input: myStopPerc(0);
var: StopPerc(0);
StopPerc = (closeS(1)*myStopPerc/100)*bigpointvalue;
setstoploss(StopPerc)
```

We have created the variable `StopPerc`, which will be assigned the monetary value of the stop-loss according to the formula shown above. This value is calculated as a percentage (`myStopPerc/100`) of the closing price of the last session (`closeS(1)`) multiplied by the one-point value of the instrument (`bigpointvalue`, which we know is equal to \$50 on the emini S&P 500).

The `myStopPerc` input helps to optimize the stop-loss value, as we will see in a moment. First, however, we should ask ourselves in what range this optimization is worthwhile.

With `myStopPerc` = 1.5 and considering a futures price of 3,000 points, thus referring to more recent times, we would obtain a stop-loss value of \$2,250 (given

**One of the most important parameters of an automatic trading system, if not the most important, is undoubtedly the stop-loss.**



by  $3,000 * 1.5\% * \$50$ ). We then decide to run `myStopPerc` input optimization in the range of 0.5 to 2.5 at step 0.25, and get the results shown in Figure 1.

Highlighted in blue, we find the best compromise to maintain the system's high net profit and average trade while keeping the max drawdown not too high.

This solution is made possible by the value `myStopPerc` = 2.0, whose closest values (1.75 and 2.25) still give good results, giving stability to this choice.

Now let's look at the results of the original strategy with a fixed stop-loss of \$1,100 (see Figure 2).

### ANALYSIS OF THE RESULTS

Before we compare the results numerically, we should consider some crucial aspects.

MultiCharts64 - Optimization Report - @ES - 5 Minute - TradeStation					
	Net Profit	Avg Trade	Total Trades	Max Intraday Drawdown	MyStopperc (SL percentuale)
1	182.175,00	431,69	422	-30.075,00	2,50
2	171.175,00	396,24	432	-24.887,50	2,00
3	169.387,50	396,69	427	-26.750,00	2,25
4	167.650,00	379,30	442	-28.850,00	1,75
5	152.975,00	337,69	453	-35.662,50	1,50
6	150.850,00	326,52	462	-35.737,50	1,25
7	149.737,50	287,40	521	-20.712,50	0,75
8	142.787,50	250,07	571	-15.200,00	0,50
9	131.237,50	266,74	492	-32.812,50	1,00

**FIGURE 1: OPTIMIZATION REPORT, PERCENTAGE-BASED STOP-LOSS.** An optimization is run to test a range of values for a percentage-based stop-loss. Here, a range of 0.5 to 2.5 is tested in steps of 0.25. The stop-loss value highlighted in blue—a 2% stop-loss—gave the best compromise between profit and maximum drawdown.

MultiCharts64 - Optimization Report - @ES - 5 Minute - TradeStation				
	Net Profit	Avg Trade	Total Trades	Max Intraday Drawdown
1	187.087,50	384,16	487	-18.375,00

**FIGURE 2: FIXED-SIZE STOP-LOSS.** Next, the same strategy is backtested using a fixed stop-loss amount of \$1,100 instead of using a percentage-based stop-loss. How do they compare? You can compare this result to the percentage-based stop-loss results in Figure 1.

**We parameterized the percentage stop-loss, optimized its value, and then selected the best result.**

Crucial aspects that should be considered are as follows:

1. We have intentionally used an instrument that has changed dramatically over time and whose equivalent value has quadrupled.
2. We parameterized the percentage stop-loss, optimized its value, and then selected the best result.
3. The data in the previous section was calculated over the entire historical range from 2008 to the present. However, the original strategy was developed more than four years ago, so we could not use the data from the latter period to optimize the monetary value of the stop-loss.
4. Only in the last four years, the instrument has grown significantly.

Without the need to run any tests, all these elements would have convinced anyone to vote for the percentage stop-loss. However, a comparison of results, which is shown in Figure 3, seems to tell us just the opposite. Using a fixed stop-loss resulted in a 9% increase in net profit and a 26% reduction in max drawdown.

In Figure 4, you can see the equity curves from the two

tests side by side. On the left (Figure 4a) is the system with the fixed stop-loss applied, and on the right (Figure 4b) is the same system with the percentage stop-loss applied. We can see that the strategy with the fixed stop-loss has grown much more evenly in the last period, and this is really peculiar because we are comparing results of a live strategy from 2019 with those of a newly optimized strategy.

From my viewpoint, in all of the automated trading tests I have done, I have consistently seen better results using *fixed* stop-losses.

I have always wondered why this is. I think it's because traders, especially institutional traders, reason more readily in absolute values than in percentages, and their habit of reasoning in this way is thus mirrored by the market.

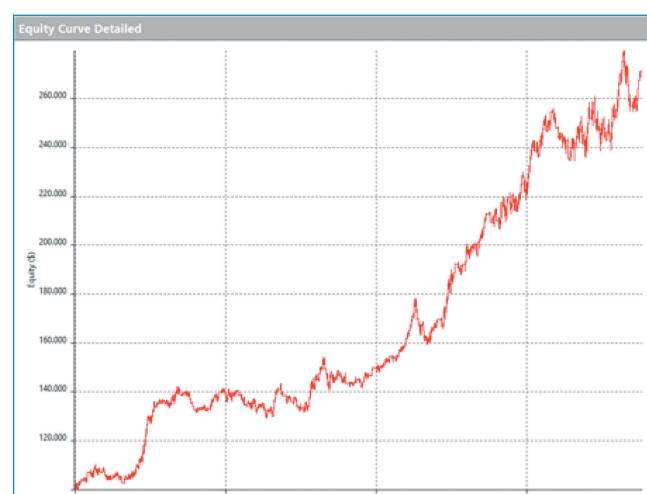
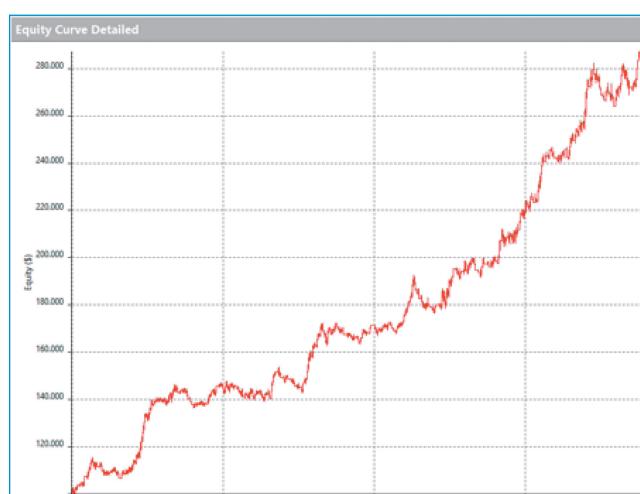
## CONCLUSIONS

In conclusion, based on the results obtained in tests done on thousands of strategies and instruments belonging to various asset classes, I believe it is better to use fixed stop-losses rather than percentage stop-losses.

Of course, this is not a rule written in stone, and much

	NetProfit	Average trade	Num trade	Max DD
Stoploss 1.1 K\$	\$ 187.088	\$ 384	487	-\$18.375
Stoploss 2 %	\$ 171.175	\$ 396	432	-\$24.888
Delta	9%	-3%		-26%

**FIGURE 3: METRICS, FIXED VS. VARIABLE STOP-LOSS.** When a fixed stop-loss amount versus the optimized percentage-based stop-loss amount from Figure 1 is tested on the same trading strategy, the fixed stop-loss gave better results. The fixed stop-loss resulted in a 9% increase in net profit and a 26% reduction in maximum drawdown.



**FIGURE 4: EQUITY CURVES, FIXED VS. VARIABLE STOP-LOSS.** Here you see equity curves from both backtests. On the left is the strategy using the fixed stop-loss and on the right is the same strategy using the percentage stop-loss. The strategy with the fixed stop-loss grew more evenly than the strategy with the variable stop-loss.

depends on the type of strategy. There may indeed be some exceptional cases where a percentage stop-loss provides better results, but the fixed stop-loss generally seems to work best.

We leave it up to the reader to test both versions so that they can see which is best for their own systems.

*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 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/tascII>).*

**In all of the automated trading tests I have done, I have consistently seen better results using fixed stop-losses.**



#### 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.

‡TradeStation, ‡MultiCharts

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