

## FUSION – BACKTESTING RESULTS & PSYCHOLOGY

There are few numbers in any backtesting which make a trader confident whether she will be able to run that system throughout its life. The beginning is always rosy when the analysis begins – its only when one dissects the results in detail that the loopholes begin to emerge & then the trader completely leaves the system never to ever look at it again. We will take an example of a very basic system just to illustrate & how we need to fine tune it to make it workable.

We start with very simple premise (for illustrative purpose only) on daily long only –

Buy = Close above 20 DAY HIGH ( $C > \text{Ref}(\text{HHV}(H, 20), -1)$ )

Sell = Close below 20 DAY LOW ( $C < \text{Ref}(\text{LLV}(L, 20), -1)$ ).

That's it. (brokerage/ slippages included – missed by many). Time frame is 1-1-2011 to 11-03-2022 & Universe is liquid Indian Stocks. Maximum 5 stock positions. Let's see results.



### STATISTICS

	All trades
Initial capital	1000000.00
Ending capital	5659639.63
Net Profit	4659639.63
Net Profit %	465.96%
Exposure %	95.01%
Net Risk Adjusted Return %	490.42%
Annual Return %	16.76%
Risk Adjusted Return %	17.64%
Transaction costs	452069.29
<b>All trades</b>	<b>254</b>
Avg. Profit/Loss	18345.04
Avg. Profit/Loss %	5.49%
Avg. Bars Held	54.06
<b>Winners</b>	<b>105 (41.34 %)</b>
Total Profit	10994053.04
Avg. Profit	104705.27
Avg. Profit %	30.27%
Avg. Bars Held	84.60
Max. Consecutive	8
Largest win	1568995.02
# bars in largest win	44
<b>Losers</b>	<b>149 (58.66 %)</b>
Total Loss	-6334413.42
Avg. Loss	-42512.84

## STATISTICS

Avg. Loss %	-11.97%
Avg. Bars Held	32.54
Max. Consecutive	12
Largest loss	-446515.00
# bars in largest loss	58
<b>Max. trade drawdown</b>	<b>-859806.71</b>
Max. trade % drawdown	-79.63
Max. system drawdown	-1599883.17
Max. system % drawdown	-52.45%
<b>Recovery Factor</b>	<b>2.91</b>
CAR/MaxDD	0.32
RAR/MaxDD	0.34
Profit Factor	1.74
Payoff Ratio	2.46
Standard Error	588112.72
Risk-Reward Ratio	0.49
Ulcer Index	22.42
Ulcer Performance Index	0.51
Sharpe Ratio of trades	0.25
K-Ratio	0.03

We can discuss many metrics but for this system to work

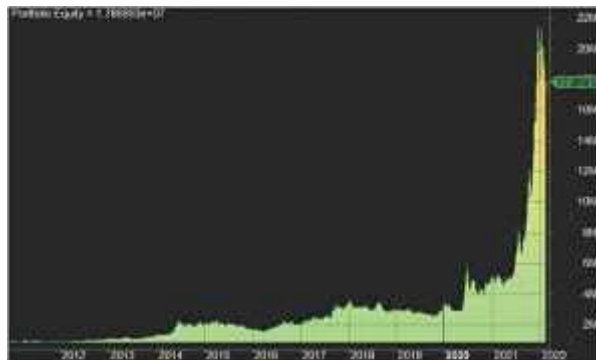
Maximum consecutive losers of 12 is high (though we may face psychological issue with this also) but might be tolerated but

Max trade drawdown% of 80%&

Max system % drawdown of 53% are **not tolerable**.

We will be applying few basic filters & see whether we can improve results.

1. Max loss -10%
2. Stock Close above 250 MA
3. Index Close above 50 MA



All trades	
Initial capital	1000000.00
Ending capital	17869027.43
Net Profit	16869027.43
Net Profit %	1686.90%
Exposure %	80.49%
Net Risk Adjusted Return %	2095.75%
Annual Return %	29.39%
Risk Adjusted Return %	36.51%
Transaction costs	659440.87
<b>All trades</b>	<b>248</b>
Avg. Profit/Loss	68020.27
Avg. Profit/Loss %	9.03%
Avg. Bars Held	46.15
<b>Winners</b>	<b>108 (43.55 %)</b>
Total Profit	22705508.48
Avg. Profit	210236.19
Avg. Profit %	31.24%
Avg. Bars Held	77.97
Max. Consecutive	6
Largest win	12625069.36
# bars in largest win	162
<b>Losers</b>	<b>140 (56.45 %)</b>
Total Loss	-5836481.05
Avg. Loss	-41689.15
Avg. Loss %	-8.11%
Avg. Bars Held	21.60
Max. Consecutive	7
Largest loss	-382046.51
# bars in largest loss	3
<b>Max. trade drawdown</b>	<b>-3587303.39</b>
Max. trade % drawdown	-39.91
Max. system drawdown	-4326851.08
Max. system % drawdown	-34.65%
Recovery Factor	3.90
CAR/MaxDD	0.85
RAR/MaxDD	1.05
Profit Factor	3.89
Payoff Ratio	5.04
Standard Error	2392359.33
Risk-Reward Ratio	0.27

Ulcer Index	13.71
Ulcer Performance Index	1.75
Sharpe Ratio of trades	0.24
K-Ratio	0.02

Now, maximum consecutive losers is 7 – **decrease of 40%**

Max trade drawdown% is 40% - **decrease of 50% &**

Max system % drawdown is 35% - **decrease of 33%.**

These results are much better – may work for some traders but they are still non workable for me.

Another point is **I test all long systems in bear/ bad market periods** – 2000-2002, 2008, 2011, 2015, 2018-2020 to check whether there was any semblance of uniformity & sanity to returns. In this case -2011, 2015, 2018-2020 was tested. This system improved with Portfolio Equity Curve filter of Close above 10MA of Equity Curve.

Can they be improved further – yes. In essence, the following points may help in creating decent trading results.

1. Stock momentum filter
2. Index filter

3. Volatility factor filter – VIX, ATR etc (VIX doesn't work in most cases)
4. One or two indicators to check overbought/ oversold situation. Surprisingly, trend following systems may actually want the indicator to be overbought to improve results.
5. Multiple entries & exits in same system.
6. Equity curve filter – works only in few conditions.
7. Combination of systems. (Trend+mean reversion + multiple time frame + any other).

I am summarizing as to what I look for in a system in general – CAR/MaxDD, % time in markets, losing streak, Max trading loss/system drawdown to match my psychology.

I would like to keep Max trading loss to less than 10% & System Drawdown to less than 15%. Also, any trader who is trading 100% of time may actually have too much costs to work around with.

Another small secret is – the most important trade is the trade you are in currently.

**Dissect trading results, match with psychology – enjoy the magic.**

**Dr. Rajeev Shukla**

## About the Author

Dr. Rajeev Shukla is a part system & part discretionary trader. His journey of trading started 16 years back & through his learning over time he developed his own systems as well as discretionary techniques to trade. He trades Equity mainly with a dash of Currency trades recently. He's a Founder-Member of Advanced InvesTrade Forum. He loves to read & is also a practicing Orthopaedic Surgeon.

