The RINA protocol

A quantum leap in the evaluation of trading systems and traders

If we follow the premise that a trader is essentially a risk manager, then we must not only measure and evaluate him on the basis of his results, but must also review and evaluate the course of the results he has achieved. It is therefore not just a question of the possible profit achieved from his trading activities, but also of how: how did the trader achieve his trading results? What risks did he take or sit out? A trader is not defined solely by his trading success, but rather by his handling of trading risks.

Questions about the development of trading results were already being asked in the 1970s and 1980s, when the first computers became interesting for the stock market. They were initially used to analyze price movements, which led to the development of market technology - the development and use of technical indicators. Computers made it possible to subject indicators to statistical analysis on a scale that had never before been possible with pen and paper. The possibilities now available gave rise to a large number of indicators and the first traders and analysts began to write the first simple evaluation programs to test the usability of these market techniques in trading. What was missing, however, were standardized evaluation parameters that could make the results of the evaluations comparable. This lack of clarity increased when evaluation programs were further developed into simple trading rules. The challenge here was to make different trading rule systems assessable and comparable side by side. What risks were involved in running trend-following trading systems? Were their risks somehow measurable and comparable with trading systems whose rules were based on price pattern recognition, for example?

The breakthrough in this problem was achieved by the US company RINA Systems, which defined a protocol with various measurement parameters and which initially established itself in the development and use of trading systems and defined benchmarks. This RINA standard became established at the end of the 1980s and made it possible to bring trading systems with different orientations and methodologies to a uniform evaluation standard. The protocol key figures also made it possible for the first time to analyze the respective trading rules and regulations in terms of their implementation components and to identify the respective individual risks.

Trading systems reached their peak of attention in trading in the early . The RINA protocol also developed in this context and increasingly became an integral part of various charting tools, which also had integrated system programming functionalities. One of the first tools for the masses was the then legendary Trade Station, whose programming of trading rules was based on the Easy Language.

With the introduction and development of electronic trading, links were created between the original analysis software and the stock exchange. This means that the programmed trading systems not only generated trading signals, but also transmitted them directly to brokers or clearers for execution. This brought the

RINA protocol was increasingly becoming the focus of the active trading side. This is because further potential applications for these protocols have now opened up:

While a distinction was still made between a trader and a trading system until the 2000s, with the latter having reached a high degree of evaluation with the help of RINA ratios, a rethink finally took place. It must be taken into account here that the trader, as an institutionalized "nostro trader", only took up his own permanent position within the rapidly developing investment banking industry from the mid-1990s onwards. While the absolute focus in direct trading in the decades before was almost without exception an order-executing service and analysis + generation of a trading decision on the one hand and order execution on the other hand were still separate (whereby proprietary trading was more of a dragged along corrective), in the 1990s institutionally organized trading groups suddenly established themselves in the trading rooms, which made trading decisions independently and also implemented them independently. As a result, scalping and phase trading were no longer just "on the fringes", but both orientations became fixed income components within a broader trading structure of banks, investment houses, hedge funds etc..

With the development of targeted proprietary trading, its importance increased not only in terms of revenue generation, but a completely different risk structure developed, which the respective trading departments had to deal with. This was because they now had to deal not only with valuation risks (the focus of risk in areas in which the service aspect was in the foreground - as in commission trading - or which were based on mathematical valuations - as in arbitrage or options trading). Now risks were taken at the trader's own discretion. The statement "To sell a bank, a board of directors needs two signatures, a trader does it alone" suddenly took on a whole new relevance. Some of the traders used now had to develop from an executive body into a risk-bearing player and reliable options were needed to be able to evaluate and assess them at every stage of their activities.

This meant that proprietary traders were regarded as independent trading systems that open, manage and close trading positions on the basis of their own decision-making. And with the increasing importance of this form of revenue generation, a whole new field of application opened up for the RINA protocol.

Trading interfaces were expanded to include RINA functionality (although today hardly anyone remembers the origin of the protocols in use). Now traders could be analyzed in the same way that originally programmed trading systems were put through their paces. Now you could suddenly put together trading teams that met the criteria of trading system portfolios. Since trading is not teamwork, there was no need to take personal sensitivities into account when putting together groups of traders; instead, they were assigned exclusively in terms of risk and return structure according to the RINA scale. The aim of every system developer to generate the smoothest possible yield curves with a significantly reduced drawdown could now also be achieved in trading groups.

Let's take a look at the structure and informative value of a RINA protocol. First of all, we can state that a comprehensive trading profile of a corresponding trading session can be created using the typical protocol indicators. "RINA says

more about a retailer than 1,000 words" was a typical saying in the compliance sector.

Structure

If you want to name it correctly, the term "RINA protocol" is now just a nostalgic name. The company has no patent rights to the arrangement of the measured parameters, nor are today's protocols identical to the first evaluation protocol introduced by RINA Systems. However, both the layout and the message of the protocol today are unchanged from its first predecessor and the term
"RINA Protocol" is still a fixture today and this protocol is a milestone in the history of stock exchange trading.

The interpretation of the parameters of a RINA protocol is subject to the same framework conditions as all statistical evaluations. The more data and the longer the data series, the more meaningful the result.

As this protocol was developed to analyze firmly defined trading rules, the existence of trading rules is of course an indispensable prerequisite. Consequently, the use of this analysis protocol only makes sense for traders who follow a clear and repeatable structure in their trading approach and implement it in a disciplined and consistent manner. On the other hand, when evaluating longer time series with the help of the protocol, it would be possible to filter out traders who trade sporadically, erratically and without structure.

The RINA protocol is divided into three sections, which are labeled I., II. and III. in the following figure.

In addition, the protocol is divided into four columns. Column 1. describes the respective statistical parameter that is recorded by the protocol. Column 2. shows the total statistical value, which is the sum of columns 3.

(exclusive consideration of long trades) and 4. (exclusive consideration of short trades).

We divide sections I., II. and III. into one "results field" (section I.) and two "results fields" (section III.).
"Statistics fields" (sections II. and III.). The "Results field" shows the final results achieved in the evaluated time period - once as overall results (column 1.), then the pure long results (column 2.) and the pure short results (column 3.).

The result field

Let's take a look at the following chart, which illustrates section I. In the **Closed P/L** row, the net total return achieved for the evaluated time unit is shown in column 2 ("Total"). This amount is made up of the net long return achieved (column 3.) and the net short return achieved (column 4.).

A total of 4,362.50 euros was achieved. This is calculated from a return of EUR 1,000 on the long side and EUR 3,362.50 on the short side.

The second line shows the result of any **open** items. If no items are open at the time of evaluation, this line shows a zero amount.

In relation to line 1, the term "net income" was used, which needs to be explained in more detail here. "Net" usually stands for an amount that is freely available after deduction of all standard deductions. In our specific example, neither taxes (e.g. withholding tax) nor fees or other charges are taken into account. There are versions of the protocol that also include these parameters, but this is not the case in our specific example.

Here we use the term "net" to refer to the amount that remains after deducting trading losses. Let's get specific:

Statistic	Total	Long	Short
Closed P/L	4362.50	1000.00	3362.50
Open Position	0	0	0
Total Winning Trade	4687.50	1262.50	3425.00
Total Losing Trade	-325.00	-262.50	-62.50

Line 3. shows all gross profits: once in total and then broken down again into long and short:

Total Winning Trade: 4,687.50= 1,262.50+ 3,425.00

Line 4. records the gross losses in total and broken down into long and short:

Total Losing Trade: -325.00= -262.50 (+) -62.50

If we now add rows 3 and 4 from column 2, we get the "net income" in row 1.

Total: *4,362.50= 4,687.50 (+) -325.00*
Long: *1,000.00= 1,262.50 (+) -262.50*
Short: *3,362.50= 3,425.00 (+) -62.50*

The statistics field 1

The first statistical field records and enables the evaluation of the "how". How was the profit achieved? What risks did the trader in order to achieve his profit?

I personally consider statistics field 1 to be the most important source of information about a retailer.

In row 1 we find the list of the average profit of all winning trades - again divided into total in column 2, long in column 3 and short in column 4.

In column 2. under **Avg Win**, the overall average of 49.34 points is shown in our example. This value is calculated from the amount of **total winning trades** (4,667.50) in column 2, divided by the number of **winning trades** in column 2 (95).

Avg Win: *49.34= 4,667.50 / 95 (column 2. Total)*

The values for column 3 and column 4 are also calculated in this way.

The average of loss trades (**avg loss**) is shown in line 2 of statistics field 1. The calculation is based on the formula *Total Losing Trades / Losing Trades*.

We will evaluate the results afterwards.

Avg Win	49.34	39.45	54.37
Avg Loss	-65.00	-262.50	-15.63
Total Trades	107	36	71
Profit Index	0.59	0.12	2.69
Total Traded Lots	214	107	107
Winning Trades	95	32	63
Losing Trades	5	1	4
Scratch Trades	7	3	4
Max Consecutive Wins	28	3	13
Max Consecutive Losses	3	1	2
Largest Gain	150.00	100.00	150.00
Largest Loss	-262.50	-262.50	-25.00

Line 3 (**Total Trades**) records all traded contracts, again broken down into total, long side and short side.

Line 4 calculates the **profit index**.

Line 5 of statistics field 1 counts the so-called **round turns**. This means that all position openings and position closings are summarized. If the positions are completely closed in the measured/evaluated time unit, the amount of **total traded lots** is exactly double the number of traded contracts from line 3.

Lines 6, 7 and 8 show the **winning trades**, the **losing trades** and the neutral trades (**scratch trades**), again broken down into total, long and short.

Lines 9, 10, 11 and 12 provide a high level of information about the stability of the trading approach/trader.

Max Consecutive Wins provide information about the winning transactions in a row (line 9), **Max Consecutive Losses** show the highest sequence of losing trades in a row (line 10). Line 11 lists the largest consecutive gain (**Largest Gain**) in relation to a contract, while **Largest Loss** (line 12) shows the largest single loss per individual contract.

The statistics field 2

The statistics field 2 classifies the trading transactions carried out in the time frame. If you are in a position, you are at risk. This analysis/evaluation block can therefore be used to record the time-related risk component with which the trader has achieved his result.

Avg Total Hold Time	00:03:19	00:00:47	00:04:35
Avg Hold Time Winners	00:03:06	00:00:45	00:04:18
Avg Hold Time Losers	00:04:51	00:00:29	00:05:57
Avg Hold Time Scratch	00:05:04	00:01:22	00:07:50
Avg Time Between	00:04:09	00:03:57	00:04:15
Longest Time Between	02:59:59	00:38:04	02:59:59
Shortest Time Between	00:04:44	00:04:44	00:05:30
Avg Time After Losing	00:02:31	00:12:31	00:00:00
Avg Time After Winning	00:04:15	00:03:40	00:04:32

The second statistics block here comprises nine lines.

Avg Total Hold Time (row 1) shows the average time window in which a position is held in the market. Here, too, we subdivide into the above-mentioned columns Total (column 2), Long (column 3) and Short (column 4).

Avg Hold Time Winners (line 2) measures the average holding period of winning trades, **Avg Hold Time Losers** (line 3) measures the average holding period of losing trades. Line 4 of the second statistics field (**Avg Hold Time Scratch**) measures the average holding period of a neutral position brought to an end.

Just as the time is measured when the trader is active, the time between trades is also of interest. Line 5 (**Avg Time Between**) contains information on the duration of the trader's inactivity.

Lines 6 and 7 measure the two extremes of the time windows between trades: **Longest Time Between** (line 6) stands for the longest inactive trading time, while **Shortest Time Between** (line 7) stands for the shortest inactive trading time in the defined time window.

Line 8 (**Avg Time After Losing**) shows the average inactivity after a losing trade, line 9 (**Avg Time After Winning**) shows the average inactivity of the trader after a winning trade.

Evaluation / statement of the RINA protocol

The statement in the results field is self-explanatory, as it shows whether the retailer is profitable or not.

Statistics field 1

In statistics field 1, you first look at the risk of the trading system/trader. The **Largest Loss** values are initially meaningful here - this shows whether the defined maximum stop price level was adhered to. In the current example, it is 10 FDAX points, which corresponds to EUR 250 per contract. Since EUR 262.50 is recorded as the largest single loss, the execution of the position management corresponds to 10.5 points, which can be explained by slippage and is therefore within the permissible range. If the loss were significantly higher than EUR 250, this would be an indication that the trader did not adhere to the stop price, which would be a clear violation of the risk rules.

The next look is at the ratio of average gains to average losses (**Avg Win** and **Avg Loss**). So far, I have only seen in trading systems that are based on trend-following trading approaches in the market that the average gains are higher than the average losses. This means that smaller average gains than average losses are not uncommon.

We find a confirming statement when we compare the **Largest Gain** and **Largest Loss** figures. If these confirm the ratio already shown under **Avg Win** and **Avg Loss**, then it is not an outlier in this ratio, but is typical for this trader / for this trading system.

In order to still be able to make money on balance with such a ratio, two basic principles are required: (a) the trading approach of the system/trader must have a high hit rate and / or (b) the trader must be able to quickly assess whether the position has a high chance of making a profit at the time the position is opened

(which allows him to increase it quickly), or whether the risk of failure increases. The latter must either lead to a rapid position closure, but usually such a position is sat out (in the expectation that it may still turn a profit), but not risked much, as there is no position expansion. RINA protocols with such a ratio and a high profit yield are typical of successful phase trading.

The ratio of **winning trades** to **losing trades** shows whether the trading system/trader achieves a high or low hit rate. The higher the number of successfully completed trades compared to losing trades, the higher the hit rate and the higher the number of **Max Consecutive Wins** compared to **Max Consecutive Losses**, the more stable the trading approach evaluated.

The key figures **Total Trades** and **Total Traded Lots** show whether the measurement series contains sufficient data so that we can assume a statistically relevant statement of the protocol and they show whether all positions are closed (and not an open position was overlooked), or how many contracts are intentionally open overnight (which must not occur in phase trading).

Further relationships between the key figures in statistical field 1 can be determined, from which statements can be made about the trading behavior of the trading system or the trader, but these are not relevant at this point. The basic principle of this protocol approach should have become clear.

Statistics field 2

Statistical field 2 says a lot about the trader's approach. Although it was originally developed for the evaluation of classic trading systems, I think it only really developed its informative value when it was used for the evaluation of human traders.

"These are the time clocks of traders" is what used to be said about the time parameters, because you can see at the first attempt how active the trader is in principle. But it also says a lot about their psyche and their trading approach. I would like to give two examples: Let's look at the following points on the chart:

The table shows that the highest return was generated with short trades in the measured time unit. 63 winning trades are offset by 4 losing trades (the relevant key figures are circled in red). In addition, there were two losing trades in a row.

It is interesting to note that the **Avg Time After Losing** indicator shows 00:00:00 for the short side. This leads to the conclusion that the losing trades did not occur in completed individual trades, but were partial losses within a larger position. These are therefore phase trades.

The topic of trader psychology is illustrated, for example, by the penultimate indicator in statistical field 2: the **Avg Time After Losing** indicator. The shorter the average time, the more likely it can be assumed that the trader comes under psychological pressure in the event of losses and may try to make up for the loss incurred.

<u>Final review</u>

Of course, a RINA protocol is also just a statistical measuring instrument, with all its strengths and weaknesses. Consequently, this protocol can only be one evaluation tool among other assessment criteria. However, one undeniable strength of the protocol is that it highlights and quickly identifies glaring anomalies in trading performance. RINA protocols thus help to separate the wheat from the chaff at a very early stage.

I wish you a relaxing weekend! Uwe Wagner