BRIEF OVERVIEW OF THE ALGORITHM

Two books in Spanish, explain in detail the algorithm.

In this section, I will try a simple explanation of the Alondra Union algorithm, referring to commodity price forecasts.

I have published in this regard, two very enjoyable books on Amazon, in Spanish.

One deals with the static numerical series, of each of the species, whose hedging data, both futures and options on futures, is published weekly by the United States Futures and Trading Commission (CFTC), which includes some 265 species in total.

It covers the sections of Agriculture, Energy, Metals, Currencies, and Bonds and Stock Market Indices. That is, there are 265 static series, one for each species.

In the second book, I explain how a second dynamic numerical series is created for each species, which is based on the first static series, where an attempt is made to expose a possible price trend for each of the species. Let us begin. In general terms, and in my personal opinion, there is a basic problem in the analysis of the evolution of commodity prices.

They are analyzed as if they were stocks, with moving averages or oscillators, for example. However, commodities are like icebergs. The important part is "invisible", and at great depth. These are hedges of futures and options on futures.

Both impact the spot price of each species, sooner or later. When I started this study, we had entered the strict quarantine stage in Argentina. It was March 2020. Since we were all isolated, I wanted to dedicate that special time to studying the problem of forecasting commodity prices.

After several computer simulations, I released a first prototype in September 2020, with the static series, and a second prototype, in January 2021, which included the first static series, with a dynamic series attached.

The static numerical series collects information on hedges, both in futures and options, published by the CFTC, and assigns an average weight to the three market players, which are Commercial, Non-Commercial and Non-Reportable.

The first, the "**Commercials**", refers to the actors who own and work with physical merchandise. They are the producers, collectors, food or energy factories, importers, exporters, mines and central banks.

The second are the "**Non Commercials**", which are the intermediaries, such as brokerage houses, investment banks and large financial investors. They are called “smart money”.

The third, the “**Non Reportables**”, are the retail investors who invest in hedges. I attributed a specific weight to each one, within the general average of the positions, both buyers and sellers.

From there comes a *SINGLE static series*, for each of the species. In the analyzes of the COT (Commitment of Traders) there is a biased analysis, for each one of the actors, which, in my opinion, adds confusion in the analysis, since the market is always one, regardless of the actors in play.

This static numerical series, already in itself, provides very valuable information on the evolution of the net coverage of each species.

If it is negative, it means that there are more selling hedges than buying hedges, and this usually predicts a drop in prices, or at least a stabilization of prices. If there is net buying coverage, we can infer that prices will rise, since there is a tendency to scarcity of it.

In the analysis of the static numerical series, I was able to verify that it is much easier to predict the evolution of the price of any species, when there is abundance, that is, when the static series of the species under study constantly presents a net selling coverage.

I labeled these species as type **“N” (negative)**. They are corn, wheat, soybean oil, for example. In general, the accuracy of the forecast ranges between 87% and 92%, with respect to the evolution of the price of the continuous future.

On the other hand, when the static series presents positive net buying coverage for at least 12 weeks in a row, there is difficulty in predicting the price trend. They are called **“P” (positive)**. This is the case of soybeans and dairy products, to name just a few examples. In general, the accuracy of the forecast ranges between 72% and 78%, with respect to the evolution of the price of the continuous future.

The other very important point that arises, analyzing the trend of the static numerical series of each species, with the evolution of the prices of continuous futures, is the notion of the so-called “latency time”. This means, for example, that a hedge buying peak takes a while to materialize in prices. In some cases, up to six and twelve months, depending on the species.

However. I realized that further analysis is needed to refine the algorithm. That is where *the dynamic numerical series* is born, the one that actually predicts the price, based on the first numerical static series.

The basic idea is to analyze the maximum values of buying hedges, and the maximum values of selling hedges of each species, in the static series, to understand how far a net hedge can rise or fall, whether buying or selling. The analysis period covers from the year 2015.

That is, I built each static series, with the data from that year, and from there I built each dynamic series, of each species, from the end of January 2021. I used the simple harmonic oscillator mathematical model, which takes into account the fastest movements, when the net coverage is in the middle, of the highest bid and highest selling values. Here an improved latency time arises, compared to that obtained with the static series.

The latency times arising from the dynamic series range from one week to a maximum of six weeks, which speeds up the rotation of the invested capital. This is in short, what is expressed in the algorithm. It is simple to understand. But it aspires no more than to give an impartial opinion, in mathematical language, of the price trends of each of the species.