

Weiss Ratings Crypto Timing Model: Phase 2 & Phase 3

Phase 2 Overview:

The second phase of cycles' model will provide cycle summary sheet, identify indicators and position/trend of the market.

Milestones Achieved:

- Weiss Ratings Crypto Timing Model Phase 1 model development completed
- The new versions to improve the model and logic and maintenance is on progress

Project Goals:

- The project is divided into three parts namely indicators (2.1), cycle summary sheet (2.2) and position of the market (2.3)

2.1 Indicators:

There are two types of indicators, Future Lines of Demarcation (FLDs), and Valid Trend Lines (VTLs). These are:

2.1.1. Future Lines of Demarcation:

- Simple moving average with period equal to Cycle/2 displaced forward by Cycle/4 (FLD) (i.e. for 80-day cycle moving average of 40 days displaced forward by 20 days will be calculated)
- All lows and then highs will be calculated using logic of phase-1 – No Backfilling or Duration fixed or syncing with price action
- These highs and lows are marked as “cycle FLD high” or “cycle FLD low” (i.e.: in an 80-day cycle it is “80-day FLD high” or “80-day FLD low”).
- All instances of prices crossing the FLD must be identified. When prices go below an FLD, it is identified as a “cycle FLD DOWNCROSS”, when prices go above the FLD, it's identified as a “cycle FLD UPCROSS”.

2.1.2. Valid Trend Lines:

- VTLs are trendlines that connect two consecutive cycle highs (a “high VTL”) or two consecutive cycle lows (“low VTL”) of the same cycle.
- A VTL is only “active” until a new VTL can be drawn. For example, when drawing high VTLs, the minute a new high is confirmed, a new VTL can be drawn, and the previous one becomes “invalid”.
- VTL's may only connect NATURAL cycle turns. No backfilled highs or lows are allowed in the drawing of these.
- A HIGH VTL is only important when prices cross **above it** for the first time. When prices move above a HIGH VTL for the first time, this is labelled as a “cycle VTL UPCROSS” (i.e.: 80-day VTL UPCROSS).
- A LOW VTL is only important when prices cross **below it** for the first time. When prices move below a LOW VTL for the first time, this is labelled as a “cycle VTL DOWNCROSS” (i.e.: 80-day VTL DOWNCROSS).
- VTLs become invalid once they are crossed for the first time. In other words, each individual high or low VTL can only be crossed once, after which it becomes obsolete.

- A special algorithm is required to draw VTLs since they may only “touch” the price action in two points.
- (The concept of tangent was discussed, the logic will be improved and finalised in future discussions)

2.2 Cycle Summary Sheet:

- This is a summary of each cycle of each duration. This list will include:
 - Start of cycle. Date of first low in Cycle
 - Starting price. Price corresponding to first low.
 - High of cycle. Date of cycle High.
 - High Price. Price corresponding to high.
 - End of Cycle. Date of second low in cycle.
 - End price. Price of second low.
 - Rally duration. Time from first low to high.
 - Decline duration. Time from high to second low.
 - Rally amount. Percentage up moves in cycle.
 - Decline amount. Percentage down moves in cycle.
 - Cycle Nature. Backfilled or Natural Cycle?
 - Cycle Trend. If second low > first low => Cycle is bullish. When second low < first low => bearish cycle. If second low is “close” to first low => neutral cycle.
- (Neutral Cycle: If the up move from the first low to high and the down move from high to second low is within some defined range, i.e. suppose the up move from first low is x, so if the down move is in the range of 90% of x to 110% of x. The range will be defined later in call and will be kept flexible)

2.3 Position of the market:

The purpose of this phase is to identify the position of the market.

This position consists of a series of algorithms:

- **The standard position is Bullish.** The first step is to label each day as “BULLISH”. (This is called “BullPosition” on Weiss version of the model. Modules => PositionCrypto)
- **Neutral Position Finder.** The next step is to look for “Neutral Shifts” AKA days when the Position goes from Bullish, to Neutral.
 - First it is to be identified when the market goes INTO Neutral. For this, we need a Cycle Frequency, and a VTL Frequency. These are not necessarily the same.
 - Once defined, the market goes into NEUTRAL when prices cross the last Cycle Frequency Low, or the currently active Frequency LOW VTL.
 - The same logic applies for exiting neutral, but in reverse. **When the market is NEUTRAL**, crossing the last Cycle Frequency HIGH or Frequency HIGH VTL returns the market to a Bullish position.
- **Bear Position Finder.** Once Bull and Neutral zones are found, the next step is to look for Bear Shift zones. These are times when the market shifts to a Bearish position.
 - We also need to define a VTL Frequency and a Cycle Frequency. These are not necessarily the same as #2, and they do not have to be equal.
 - A bear shift is declared when the last Cycle Frequency LOW is crossed.

- (Optional) A bear shift is also declared when the market is NEUTRAL and the Frequency LOW VTL is crossed. This does not apply to crypto markets and therefore can be switched on or off.
- **Bear Position EXIT Finder.** Once Bear Shifts are defined, we need to define when the Bear Shift ends.
 - The same Cycle Frequency and VTL Frequency as #3 are used.
 - The key here is that after a Bear period ends, the market may go back to Neutral, or back to Bullish. If it goes back to Neutral, it may then revert to Bearish.
 - Three points need to be found. A. The next Frequency HIGH VTL crossover. B. The next Frequency Cycle High crossover. C. The next Frequency Cycle LOW crossover.
 - If B comes before A: Market goes straight from Bearish to Bullish on the day of the Frequency High Crossover. All days between the Bear Shift and this Frequency High (see #4.3, point B) crossover are marked as "Bearish".
 - If A comes before B: The market goes to Neutral. All days between the Bear Shift and the VTL crossover (see #4.3-point A) are marked as "Bearish". In this case, we also need to find whether the Frequency Cycle Low defined on #4.3-point C takes place with the Market in NEUTRAL. If so, this point C is labelled a Bearish Shift as well.
 - This algorithm needs to be run as many times as needed until no changes are made to the position of the market. Explainer: Note that in #4.5 we may end up with subsequent Bear Shifts that are unfilled. Running the algorithm until no changes are made fixes this.
- **Parabolic Trend Finder.** Parabolic Trends are defined as periods when the market accelerates to the upside. These are always followed by a crash.
 - There are two types of Parabolic Trend. Fast and Normal. For this, we define a Cycle Frequency and a VTL Frequency. These do not have to match.
 - Fast Parabolic Trend is when prices exceed the range between the last Cycle Frequency High and the Cycle Frequency Low that followed it times a modifier. The modifier can be customized but a default value needs to be set. 3.5 is typically used.
 - Normal Parabolic Trend is when prices exceed the Frequency HIGH VTL during a BULLISH position. When this happens, the range between this crossover and the last Cycle Frequency Low is taken. When prices exceed this range times a modifier, a parabolic trend is declared. The value can be customized but the default value is 2.67.
 - Both Parabolic Trends end when the smallest cycle FLD is crossed to the downside. The difference is when a Fast-Parabolic Trend ends, the market shifts Neutral. When a Normal Parabolic Trend ends, the market goes Bearish.
 - The logic for ending Neutral and Bearish phases needs to be run after finding all parabolic trends.

Phase 3 Overview:

This third and final section of the model deals with trading signals and strategies.

Project Goals:

- Strategies can be divided into two parts.
 - Entry signals
 - Exit signals.
- In addition, the track record needs to be computed whenever a strategy is run. These are three phases of this section as well.

3.1. Entry Signals: T

- There are three trading strategies that need to be coded: 20-day Cycle Breakouts, 80-day Cycle Breakouts and Trend Trading.
 - 20-day Cycle Breakouts:** These are buy or sell signals that take place when prices cross the last 20-day cycle high (Buy signal) or the last 20-day cycle low (Sell signal).
 - 80-day Cycle Breakouts:** Idem above except with 80-day cycle instead of 20.
 - Trend Trading:** Trend trading is a strategy that buys the market when the trend SHIFTS BULLISH (Coded in Phase 2.3), exits the market when the trend SHIFTS NEUTRAL, and goes short the market when the trend SHIFTS BEARISH.
 - Strategies 20-day Cycle Breakouts and 80-day Cycle Breakouts follow the same logic:** They can be coded together with cycle duration as a variable input.
 - Conditional Entry:** In addition, strategies 20-day Cycle Breakouts and 80-day Cycle Breakouts have entries that depend on the trend of the market (Coded in Phase 2.3). This means the analyst will select whether the strategy will execute long and short entries, and what market trends are allowed for each. As an example, the strategy on 1.2 could be run only for going long, and only on markets that are either Neutral or Bullish at the time of entry, excluding Buy Signals on Bearish markets.

3.2. Exit Signals:

- There are 4 kinds of exit signals. These trigger for every entry that found on above. The exit signals are: Profit, Swing, Turn, and Trend.
 - Profit Exit:** This exit signal triggers when prices have moved a certain percentage (+25% by default) from the entry point given above AND prices cross the smallest Cycle FLD in the opposite direction of the trade (Downcross for longs, Upcross for shorts).
 - Swing Exit:** This exit signal triggers when prices break the last medium-term cycle (80-day for crypto) high or low depending on the trade's direction (Last high for shorts, last low for longs).
 - Turn exit:** Same as above but using the smallest cycle (20-day in case of crypto).
 - Trend exit:** This exit signal triggers when the trend shifts in the direction opposite of the original signal. For longs, Trend exits are when the market SHIFTS NEUTRAL or SHIFTS BEARISH. For shorts, Trend exits are when the market SHIFTS NEUTRAL or SHIFTS BULLISH.
 - These exit signals are all run for each entry signal coded above:** Whichever happens first is the one that is selected as the exit for each individual entry.

3.3. Track Record. Whenever a strategy is run, we will have several entry signals with their corresponding exits. These will give a track record. The track record needs to return the overall profitability of the strategy in percentage terms, as well as the number of long and short trades, the percentage of longs that are profitable, the percentage of shorts that are profitable, as well as a breakdown of success chance per trend (percentage of winning trades entered in each of the 3 possible trends). Finally, the track record needs to be compared with the Buy-And-Hold alternative, which assumes a person buys on the first trading day on record and sells on the last day on record.

Optimization. The code needs to optimize the conditional entries on 5th point of Entry Signal above to select the best combination of buy/sell signals along with their corresponding exits on different market trends. In other words, the algorithm starts by allowing only Buy Signals on Bull markets, calculating a track record, it then moves on to Buy Signals on Bull and Neutral markets and so on until the best performing strategy is found. This process is done for both 1st and 2nd point of Entry Signal to have the best combination of entry signals for each.

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