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Many people talk about investor sentiment but what are they really talking about? What exactly is investor sentiment? We know what investors are and we know what the definition of sentiment but what exactly is investor sentiment? Ask 10 different investors and you are likely to get 7 different answers. They will all seem similar but each will have a slightly different spin.

For the purposes of our theories we define investor sentiment as a snapshot of investor's feelings about future prospects of an investment(s). A high or bullish degree of investor sentiment implies that investors are optimistic about future potential for an investment. Conversely low or bearish view implies that investors are not optimistic about the future potential of an investment

Why is sentiment so important? We believe that the answer is simple. As investors the success or failure of our investment decisions today is determined by other investor's actions in the future. The extent to which investors share our outlook or views, with respect to a given security, is the primary determinant of well our investment will perform. Although we like to think that our intelligence and brilliance helps us find those perfect investments the reality is that we need other investors to come to the same conclusions after we do in order for our investment to work out. In other words no matter how brilliant the investment idea if other investors do share the same view, the likelihood of that investment acting the way we want it to is low. The Brinson Beebower theorem, that states 90% of investment return is attributable to asset class selection, merely says the same thing. Being in equities during a broad market decline (a period of negative sentiment where most investors are sellers) will lead to most individual investments declining.

### Sentiment Components – The Game of Poker

The concept of investor sentiment is one which many investors buy into but the question is how do we measure it? How do we attach value to the feelings of fear or greed that ultimately are the driving forces behind investor sentiment. We believe that in order to do this we must understand how behavior works. Since the two primary emotions that guide human behavior are greed and fear we need to understand how these emotions apply to investors.

Let's take as an example a game of poker. Each player is dealt a hand and a series of bets begins to take place. Each player has the option of; folding their hand, matching the current bet or calling and increasing the bet. The extent to which each player believes he can win with the hand that he has will be the primary determinant of how they behave. The more optimistic a player is that he will win, the longer he will continue to bet and more importantly the higher he will bet.

Along with considering their own hand most players will also watch the activities of the other players. If they see behavior from other players that appears to indicate that the other players may have a good hand then they also consider the risk of going further and losing. Add this to the upside potential and we have the two primary components that make up the poker player's decision. If the betting is small they may continue but if the betting increases in size then they may opt to fold and not risk any further monies. Ultimately the decision will be based on the combination of future potential and risk. The same relationship applies to investing. The more upside potential relative to a potential level of risk in a particular security the greater the desire of investors to make the investment

This explains the first part of our sentiment modeling. The greater the perceived level of success relative to the perceived risk the greater the level of sentiment.

Investor Sentiment ( $IV_i$ ) = {perceived level of success of the investment/ versus the risk ( $RR_i$ )}

$$IS_i = f\{RR_i\}$$

We believe that sentiment is not purely made up of a risk reward process of future returns. We also believe that other factors are at work when trying to determine investor sentiment.

Before we go further we need to explore in more detail the relationship between greed and fear and their relevance, in particular, to investment market behavior. Human beings have two basic, primal instincts, greed and fear. Scientifically it has been determined that fear tends to dominate greed and later we will discuss how this affects security price movement but when dealing with non significant money we believe that there is a paradigm shift in the basic theory. The key here is non significant money. We define non significant money not as an amount but rather as a condition. Money is considered to be Non significant money if that money that does not significantly affect one's personal life. Since most people invest or gamble with funds they can lose we deem that most funds in investments are non significant. It is also the money that money managers manage. Although some money managers manage billions of dollars, the money is usually other people's and although poor performance will have an impact on them to a certain degree, losing money is not a significant event as we define it.

**Paradigm Shift - Greed dominates fear when non significant money is at stake.  
Investment monies are non significant monies**

We believe that when dealing non significant money that human behavior tends to be more influenced by the upside potential rather than the down side risk. Only when the personal significance of money increases, that the fear of loss tends to catch up and then dominate.

Let us look at another example, casinos. Note: Although our examples of human behavior tend to revolve around gambling we assure you that any link to investing is purely intentional. Why are casinos so profitable? The answer lies in exactly what we have been saying. Casinos depend on the fact that gamblers will let greed dominate their behavior. It is not that individually, gamblers do not make money during short stints at their chosen game, in fact many do, but when it comes to down to walking away ahead most gamblers fail to do so. The reason for is that the gamblers see the potential of more upside as a stronger force than the risk of losing their money.

This still does not answer the question however, why human behavior over weights greed versus fear when it comes to non significant money? We believe that an example of this can also found at the casino. Gamblers tend to lose money in games of chance because the perceived level of unknown or randomness allows them to think that they have a chance. Most people who go gambling know that the “house” usually wins yet they gamble anyway because there is always a chance that they will win. If we apply the same logic to investor sentiment we see a similarity. Most investors do not make investments thinking that they are going to lose yet in many cases investors still make the same mistakes that they have lost with in the past. The reasoning is that “this time is different” always has some impact on the decision process and that is because in equity markets, volatility equates to randomness, especially in the short term.

Investor Sentiment =  $f\{\text{perceived level of success of the investment/ versus the risk , Randomness}\}$

$$IS_i = f\{RR, RAN\}$$

The degree to which individual investors believe in the future potential of their investment the higher their individual or unique sentiment. The degree to which all investors in aggregate believe in the future potential of their investment is investor sentiment. Since we generally transact though relatively efficient market creating mechanisms

$$IS_A = \sum IS_i$$

### Sentiment Measurement

Having an understanding of what sentiment is one thing but to put it into more practical use we need to be able to quantify it. We believe that how price movement occurs is just as important as how much price moves. The reasoning takes us back to our sentiment equations and the idea of randomness. As a result our measurement process involves looking not only at how much prices move but the how they move, in particular within the frame work of relative behavior

To try and get a value for basic emotions we first need to break down investing behavior into its basic components. Since by definition all markets are a function of supply and demand, we need to break down markets into their base components of supply and demand. In a dynamic environment like equity markets, unlimitless stimuli are constantly influencing investment decisions. The result is to have constantly shifting supply and demand curves. This constant shifting results is cyclic behavior of prices. Since every cycle is made up of both an upward and downward phase, understanding how each phase or wave relates to the previous will provide the starting point for calculating supply and demand. Below we have illustrated how price behavior is broken down and the different components of behavior measured.

### Note on Relative behavior

Understanding behavior in relative terms is very critical. Since supply and demand are inseparable any analysis that does not consider the behavior of one relative to the other fails to fully gauge the effects of the full cycle. In much the same way that the poker player considers the potential of his hand to win versus the amount he has to risk in order to realize that potential, investment market behavior must measure the two forces as well

The process we use is three fold.

### Medium Term Wave Ratio

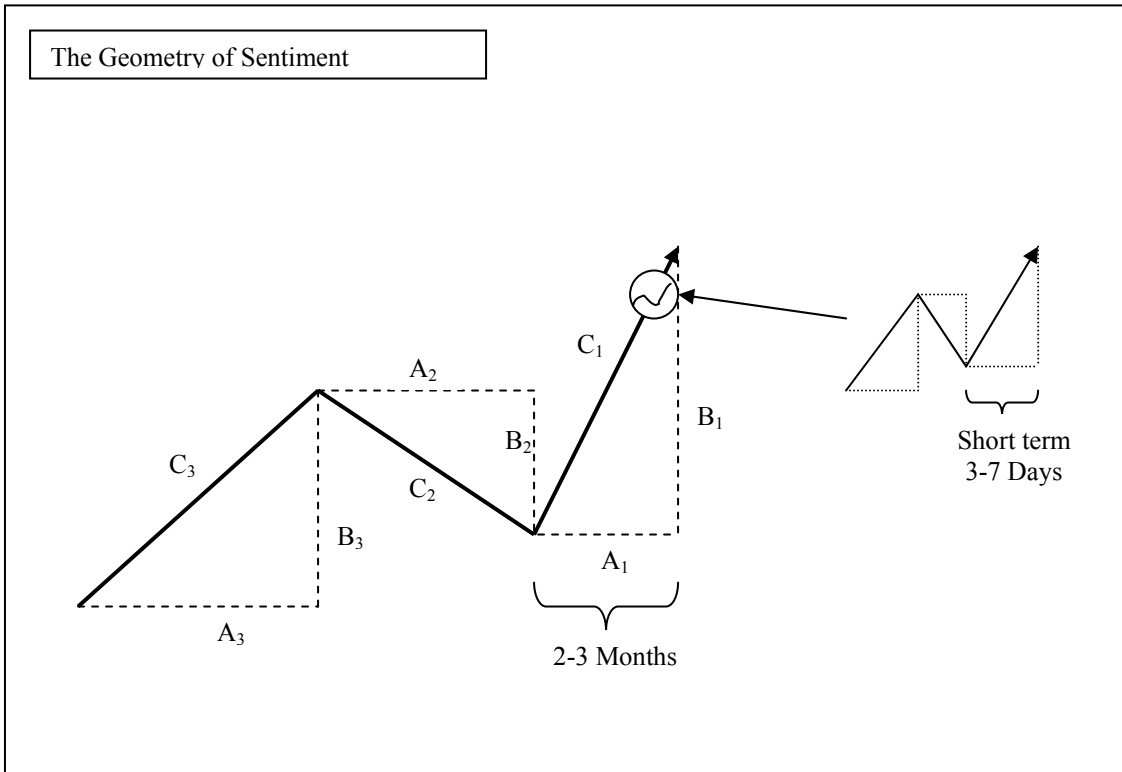
The first and most important step is breaking down price behavior into the two basic components of supply and demand measuring the relative movements of each. The rationale here is simple; the extent that investors are willing to a buy a security (demand) relative to the extent that other investors are willing to sell a security (supply) indicates a strong overall level of sentiment inherent within a security.

### Quantechnic Relative Strength

The next step is to measure movement relative to recent history using a proprietary RS tool. This process calculates the average of the past 7 cycles including standard deviations and based on that data applies a simple mathematical formula that has a very unique benefit. As the duration of a cycle phase or wave nears the historical average, the natural tendency will be to inflect unless there has been a significant shift in price. The different points of inflection then become very good boundaries for future measurement.

### Short term Wave Ratio

The final piece of the puzzle is looking at the short term sentiment data. Often as a cycle nears a turning point the underlying or “shorter term” sentiment data is already turning. By employing a measurement similar to that used to calculate the “larger” supply/ demand readings we can also do the same with a smaller internal cycle. The only difference is in the weighting



Our Sentiment measurement process involves some aspects of self modification of the variables the general process is described below

$$\text{Sentiment} = \text{WR}_1 * \text{WR}_C + \text{QRS} + \text{WR}_{\text{ST}}$$

Where ;

**WR<sub>1</sub> - Medium term Wave Ratio -**

$$\text{WR}_1 = (C_1 / C_2) * 4 + (B_1 / B_2) * 2 + (A_1 / A_2)$$

$$\text{WR}_2 = (C_3 / C_2) * 4 + (B_3 / B_2) * 2 + (A_3 / A_2)$$

$$\text{WR}_C = (\text{WR}_1 - \text{WR}_2) / \text{WR}_2$$

**QRS - Quantechnic Relative Strength**

CA = 1/2 Cycle average

$$\text{QRS} = \text{Weighted Average}((P - P_{\text{Can}}) / P_{\text{CA}}, \text{CA})$$

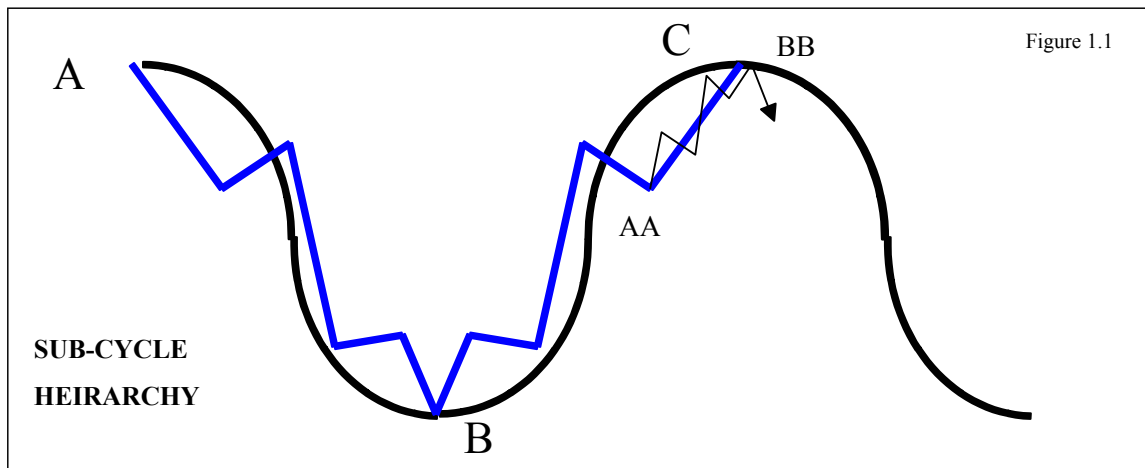
**WR<sub>ST</sub> - Short Term Wave Ratio -**

Formula the same as Medium term WR but using smaller cycle

Appendix A:

**Cycle Hierarchy**

Securities price are constantly in a state of disequilibrium. The forces of supply and demand are continually pushing and pulling with one side more dominant than the other and vice versa. The result of this constant struggle is the creation of a cycle. With a cycle there are two distinct phases, an up phase and a down phase. Each phase is made up of a series of smaller cycles. Depending upon the time frame we are considering the phase or wave is the aggregate of the smaller cycles. Therefore the upward half of a cycle or the up wave is the aggregate demand and the downward half of a cycle or down wave is the aggregate supply.



**Overview**

Sentiment Cycle theory was created from the concept that the sentiment inherent in any given security can be deduced from its price action. The theory was developed with just two outcome restrictions. The first, that the theory be applicable across all time horizons and all securities. The second was that it would be predictive vs. the traditional technical approach of conformational (after the turn has occurred).

All security price's cycle. The cycle consists of two waves, an up and a down. It is the dynamic interaction of these waves that the sentiment cycle theory focuses on. The basic force of supply and demand is what drives security prices but what drives supply and demand? Market participants are what drive supply and demand and understanding how aggregate thought process are meshed together and the inherent psychology that is relayed about these thought process's, is the key to understanding where a securities price is headed in the future

It is not the purpose of this page to restate the entire theory but rather to provide an overview of some of the key concepts that we use. To begin to expose readers of our research to some of the terminology that we use and what that terminology implies about a securities price action currently and looking forward.

**Understanding The Supply-Demand Relationship**

All securities are subject to the most basic of economic forces – supply and demand. Put another way supply = sell pressure and demand = buy pressure. Understanding how these forces are at work on a given security is the outcome of the Sentiment Cycle Theory. Our Sentiment Cycle Theory suggests that these forces are never static and that they are always changing and working against each other. From intra-day tick patterns to monthly patterns the buy/sell force is always existent and constantly changing.

The buy/sell force may be negative in certain time horizons and positive in others. The Sentiment Cycle Theory attempts to tie together the buy/sell forces that exist from different time or “strength” horizons. It is this dynamic interaction within a securities wave structure that provides the output we seek – the quantified level of investor sentiment in a security.

We measure the interaction between waves by measuring their level of directional pressure. We do that a number of ways

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**Wave Ratio Structure – WRS**

It is not enough to understand how strong a security is on the buy side. Buying is only one force and sell side activity must also be factored into the equation. We use 3 ratios to help us determine the overall wave ratio structure. Each ratio is always stated in terms of the up wave to the down wave.

**PX Ratio**

the Ratio the measures the ALR R value of the up wave relative to the down wave period when the value is greater than one the ratio is bullish and when the value is less than 1 the ratio is bearish. In the example below the up wave measured 32 degrees and the down wave measured 22.6 degrees so the ratio if the up to down was 32:22.5 or 1.35:1

**%RT Ratio / Logarithmically Adjusted %RT Ratio**

this ratio measures the level of retracement in each wave relative to its previous or counter wave. The more of a wave that a counter wave retraces the more bearish the number. In the example below the down wave retraced 53% of the up wave so the ratio of the up wave to down wave = 1/.53:1 or 1.88:1

**Cycle Balance Ratio**

This measures the number of days in an up wave versus the number of days in a down wave. The number of days in the up wave was 49 and the number in the down wave was 42, or a 1.16:1

**Composite / Comp Ratio**

This ratio puts together the three ratios above in a weighted formula to get the overall wave ratio.

