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Financial cycles and their relevance in predicting economic activity

Abstract

Cycles play an important role in influencing natural, social and economic events. This paper is concerned with the degree to which underlying cycles in financial markets are capable of predicting major turning points in an economy. The Dow Jones Industrial Average and Standard & Poor's 500 indices are used and analyzed to study cyclical fluctuations in the United States economy. This is done through a series of tests, the first of which focuses on the precision to which turning points predicted by cycle analysis mirror actual market turning points. The second part of this research evaluates the profitability of an investment strategy based on cycle analysis against the returns generated by two control strategies, a random and risk-free strategy. Finally, we looked at the phenomenon of interference as a mechanism to extend the accuracy of cycle analysis in anticipating important market movements in economic activity. The findings of this paper demonstrate to what extent cycle analysis can effectively predict pivot points across indices and the American economy and thus the relevance of cycles in further understanding economic activity.

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I. Introduction

"The longer you can look back, the farther you can look forward" Winston Churchill

A standard dictionary definition of a cycle describes it as an interval of time during which a sequence of a recurring phenomenon is completed (Merriam-Webster, 2018). Thus, a cycle is formed of an intricate set of events that follow a defined order and repeat in a predictable manner over time. Many such cycles surround us and subliminally influence the rhythm of our lives.

From those cycles that ensure the survival of living organisms such as the cardiac or carbon cycle, to those planetary and astrological cycles that constitute the essence of time itself, the phenomenon of cyclical activity dictates many dimensions pertaining to the natural course of life on earth. Whilst cycles are most commonly associated with the fields of physics and mathematics, cycle analysis has been studied across a wide spectrum of disciplines including agriculture, politics and even fashion.

This paper will be concerned with the study of cycles in economic activity. Cycle analysis in economics is a relatively new topic of study which gained notable academic interest following the findings of Kondratieff with his long wave theory of cycles in production and relative prices (1922).

As the literature surrounding cyclical fluctuations in the economy and social development grew, government officials resorted to cycle analysts to gain insight into the sources of crises. Such was the role of Edward R. Dewey who was employed as Chief Economic Analyst of the Department of Commerce in 1930 following the Great Depression. Dewey devoted his life to the study of cycles and carried out extensive studies of cyclicity in economic, geological, biological, sociological and physical sciences in addition to other disciplines. As a result of his research, Dewey found that seemingly unrelated time series were often characterized by cycles of similar length in cyclical synchrony. Hence cycle analysis has found a widespread application in economics today from Kuznet's theory of cycles arising from infrastructure and investment (1930) to Schumpeter's theory of cycles in technological innovation (1961). All these cycles are important as they influence the performance of financial markets. Given the fundamental concept of cycles as being a repetition of processes over specific time

periods, cycle analysis has also been used to develop financial tools for improving investment forecasts.

Empirical studies of cycle analysis employed certain techniques judged outdated by modern statisticians and hence this paper finds scientific relevance in the use of statistical methods to analyze time series data deemed appropriate in modern economic literature and applying them to financial indices and economic activity covering an extensive period of time under which we are better able to observe cyclical patterns.

The social relevance of this paper relates to the more comprehensive study of fluctuations in economic activity it provides which can contribute to better manage recurring sources of instability, take preventative actions and inspire sustainable monetary policies. At an individual level, understanding the cyclicity of economic activity can provide important information about patterns in our behavior. Dent & Pancholi (2017) argue a principal cause for the periodicity of wars stems from a repetition across generations of similar mistakes. As such, acknowledging the presence of cycles in our behavior could pave the path for a brighter future. This is not the ambition of this paper, yet I believe that an evaluation of cycles in current economic paradigms can further extend the relevance of cycle analysis in economic literature.

Therefore, this research will be concerned with answering the following question:
To what extent can cycle analysis be used to predict major turning points in economic activity?

To answer this question we will analyze the two largest indices in the economy of the United States (the Dow Jones Industrial Average and Standard & Poor's 500) and test the accuracy to which turning points predicted by prominent cycles match actual turning points in the indices. Given this, we will seek to determine the profitability of a strategy based solely on cycle analysis against different investment scenarios and compare their respective returns. Finally, the theory of interference will be evaluated in economic cycles and used to establish to what extent the major turning points predicted by cycle analysis, determined as the frequency of convergent cycles in a given time interval, match major price movements in the stock market and in changes in the GDP of the United States economy.

In this paper, we find that cycle analysis can be an accurate tool for predicting the actual major and minor turning points in the Dow Jones Industrial Average and Standard & Poor's 500 indices. In addition, an investment strategy based on cycle analysis outperforms the case in which an investor has no strategy at all and, also, can generate a higher return than the risk-free market rate of return when used in conjunction with technical analysis and a sufficient trading allowance of the cash balance. Finally, we show that interference of cycles within and across both indices can be used to predict the timing of important market movements in the broader economy.

Thus in the first part, we will study the phenomena of cycles to predict major turning points in financial markets. Subsequently in a second part, we will demonstrate the validity of the identified cycles through the study of cycle analysis as an investment strategy. Finally, in the third part of this research, we will test the theory of interference as a tool for predicting economic cycles and stock market movements by demonstrating how these major turning points relate to economic events.

II. Empirical Framework

Cycle analysis has been applied to a wide spectrum of domains of which the three most prominent are economics, finance and geo-politics.

Clement Juglar was amongst the first economists to study the phenomenon of cyclical fluctuations in economies. Juglar studied the rise and fall in interest rates and prices in the 1860's and identified a medium-term economic cycle of approximately 10 years which each followed four phases: prosperity, crisis, liquidation and recession (Juglar, 1862). The economic explanation for the Juglar cycle resulted from oscillations of investments into fixed capital and has been verified by several other academics such as Korotayev et al. (2010). These cycles have since been extended into mathematical models and applied to present global markets (Grinin, 2010). Juglar cycles are more commonly referred to today as "*business cycles*".

Later, in the 1920s, Nikolai Kondratieff similarly observed that the historical record of certain economic indicators appeared to indicate a cyclic regularity of phases of a longer period, 48-60 years (Kondratieff, 1922). These long wave cycles are known as Kondratieff

cycles. The underlying forces behind these waves relate to inequity, advances in technology and inflation shocks caused by major wars which disrupt economic growth and lead to recessions (Kondratieff, 1935). Many social scientists consider Kondratieff waves as a very important component of the modern world-system dynamics (Thompson, 1990) and their presence in price dynamics has found wide empirical support (see Gordon 1978; Van Ewijk 1981). Marchetti (1986) found evidence of Kondratieff cycles using physical indicators such as energy consumption and transportation systems dynamics. Furthermore, Korotayev et al. (2010) employed spectral analysis on the world GDP and found the presence of Kondratieff waves in the world GDP dynamics. In addition, he discovered that the observable economic deterioration in the world economy matched the calculations of the Fifth Long Wave of the Kondratieff cycle.

Both the Kondratieff long waves and medium-term Juglar cycles are associated with the same fundamental change, the transition to a new pattern of development of production based not only on the utilization of new resources, but also on economic growth through investment and innovation (Grinin, 2016).

A shorter economic cycle was introduced by Joseph Kitchin. The Kitchin cycle was characterized by a period between 3 and 5 years and is caused by fluctuations of enterprises' inventories. The mechanism behind these cycles was described by time lags in information movements affecting the decision making of commercial firms (Kitchin, 1923). The cycle originates from an increase in enterprises' output as a response to the improvement in economic conditions. Optimism causes enterprises to oversupply the market with commodities that leads output to accumulate in inventories and the necessity for enterprises to decrease output. However, this process takes time due to lags in the transmission of information about oversupply and for enterprises to react on this information (Rumyantseva, 2003).

In 1930, Simon Kuznet discovered another economic cycle of 15-25 years. Kuznet swings were associated with demographic cycles notably in flows of immigration and the changes in construction intensity resulting from these population flows (Kuznet, 1930). Academics have since developed further models of Kuznet swings such as Forrester who established a strong relationship between Kuznet cycles and cycles with expenditures in fixed capital or

infrastructure investments hence their alternative title of infrastructural investment cycles (Forrester, 1977).

The role of innovation implied in the previous work of Juglar and Kondratieff, was revived by Schumpeter in his famous theory of cycles founded on the concept of 'creative destruction'. Schumpeter stipulated that excluding any innovations and innovative activities leads to a stationary state corresponding to the Walrasian equilibrium. The entrepreneur disturbs this equilibrium and is the prime cause of economic development that proceeds in a cyclical manner. Schumpeter suggested a model in which the four main cycles (Kondratieff, Kuznets, Juglar and Kitchin cycles) could be added together to form a composite waveform according to which, a Kondratieff wave would consist of three lower degree Kuznets waves. In turn, each Kuznet wave would contain up of two Juglar waves. Similarly, two Kitchin waves would form a higher degree Juglar wave. He further argued that when each of these cycles was in phase, they could explain major economic recessions (Schumpeter, 1939).

Given that stock markets tend to mirror the momentum of an economy, cycle analysis has also been applied to predict movements in financial markets.

Indeed, amongst the most recognized names in finance is that of William Delbert Gann, a highly successful trader of commodities who developed a series of rules for forecasting stock prices and several technical analysis tools based on his knowledge of cycles. W.D. Gann (1942) advocated that time is the most important factor in determining market movements and that appropriately understanding the past activity of any commodity or stock is the key to predicting its future trading pattern. Gann studied the history of many commodities and discovered geometrical patterns in market movements that occurred periodically and determined that cycles predict either a turning point or acceleration of price action. The principles developed by Gann remain widely used amongst financial analysts today and have inspired new financial models such as the Multifractal Model of Asset returns (Mandelbrot, 1997) and the Log-Periodic Power laws (Sornette, 1996). Gann's alternative perception of analyzing financial markets led others to test and publish their own findings on seasonal price fluctuations in the stock market such as Williams and Noseworthy (1977) who found that predictable prices in futures markets based on cycle analysis occurred more than 80 percent of the time over a 16-year period or more.

More recently, the phenomenon of cycles has been used by international institutions as they seek to better understand market mechanisms and policies to reduce the threats posed by financial crises. Claessens et al. (2011) published a paper for the International Monetary Fund analyzing cycles in credit, house prices, and equity prices. The results show that financial cycles tend to be long and severe, highly synchronized within countries and accentuate each other, especially during coincident downturns in credit and housing markets.

Moreover, cycle analysis has been applied to the study of geo-political dynamics.

Indeed, the history of mankind has been punctuated by cyclical fluctuations between periods of rest and instability. One theory to explain this phenomenon is the Hegemonic Stability theory. A hegemony refers to a single nation's ability to dominate the rules and arrangements of international political and economic relations (Goldstein, 1988). According to this theory, world politics are more likely to remain stable with the presence of a hegemon and that the rise and fall of this hegemon follows a cyclical pattern which, generally, correspond to the periodicity of wars and peace over time. The Long Cycle Theory of Modelski and the World System Theory proposed by Wallerstein have emerged as the two dominant approaches to the Hegemonic Stability theory (Boswell & Sweat, 1991).

Modelski describes wars as "systemic decisions that punctuate the movement of the system at regular intervals" (1987). As such, Long Cycle theory establishes a connection between war cycles, economic supremacy, and the political aspects of world leadership. The theory presumes that the long cycle, in which great powers rise and fall, results in a progressive evolution of world politics that emerges from the functional needs of the system (Modelski, 1987). Furthermore, Modelski and Thompson (1996) illustrate the correlation between hegemonic cycles and Kondratieff waves. These hegemonic cycles offer an interesting perspective on the core geopolitical structure by explaining the processes by which nations achieve world dominance and are succeeded by another nation in a timely manner (Flint, 2016).

Whereas, the focus of the Long Cycle theory is about the dominant powers in the interstate system, referred to as the core by world-system scholars, the World-System Theory expands to the whole system through the interactions between the core, the semi-periphery and the periphery. This core/periphery hierarchy is the fundamental theoretical construct of the

World-System theory (Boswell & Chase-Dunn, 2000). Terence Hopkins and Immanuel Wallerstein described the cyclical rhythms in the stability of the world economy based on a hegemons ability to sustain a comparative advantage in profitable types of production and maintain order in the core/periphery hierarchy (Wallerstein, 1987).

In the long run of sociocultural evolution, both the long cycle approach and the world-systems perspective see the rise and fall of powerful nations as an important dynamic. The long cycle model depicts a process of co-evolution of economic and political power sequences while the world-system approach examines the hegemonic sequence (Wallerstein, 2003).

Ever since, scholars have been interested in the cyclical patterns of political and social phenomena such as the structural-demographic theory of state collapse (Goldstone, 1991). According to this theory, demographic growth causes population pressure on resources and this results in fiscal problems for the state, which leads to increasingly violent competition among elites and popular rebellion (Turchin, 2016). Goldstone's original model and its subsequent extensions (see, Turchin and Nefadov 2009; Korotayev et al., 2010) show that the internal dynamics of state breakdown and regime change involve revolutions, civil wars and political instability caused by within-polity population growth.

Therefore, the study of cycles appears in a wide range of fields across academia from understanding patterns in the economy, developing tools to analyze financial markets or explaining the evolution of society. Theses notions and techniques developed in previous research will be used to guide our own analysis of cycles.

III. Data & Methodology

A) Data

In order to study the phenomena of cycles, we will use the United States (U.S.) as the country to base our research. This is done for two main reasons. Firstly, the U.S. is the largest economy and, also, boasts the largest stock exchange in the world, the New York Stock Exchange (NYSE). Secondly, the activity of a stock market exerts and reflects major influences on the economic performance of a country and given the importance of the NYSE on a global scale and its ability to affect international markets, it is most relevant to study the U.S.

To appropriately study cycles, we require a stock index that reflects the general performance of the country and spans back far enough in order to ensure the largest number of observations for our research. The Dow Jones Industrial Average (DJIA) is the second oldest U.S. market index after the Dow Jones Transportation Index but, unlike the latter, is not specific to a single sector rather it is composed of the financial performance of the 30 largest cross-industry firms in the U.S. economy. The size of these companies implies that they are important leaders within and hence major indicators of the broader economic health of the U.S. as reflected in their price action. The DJIA was first calculated in May 1896 based on the 12 largest American companies at the time, and will be used as the starting date of our analysis. In 1929 it was extended to 30 companies for which market prices remain indexed through to today providing a large amount of data on various time-spans for which we will exclusively study weekly, monthly and quarterly data in this paper.

Data on the DJIA is retrieved from Bloomberg L.P., a source used by most financial institutions and private investors to acquire reliable information on financial markets.

Hence our study of the ability of cycles to predict major turning points in an economy will use time series data on the weekly, monthly and quarterly performance in the DJIA covering 1745, and 560 and 474 observations respectively.

With regards to the second part of this research paper on the use of cycles derived from the time series data in an investment strategy, we focus our study on the Standard & Poor's 500 index (S&P 500).

Whilst the timeframe of the DJIA is optimal to study the presence of cycles, it presents certain drawbacks due to the manner in which it is price-weighted and calculated. Indeed, unlike the actual economic performance which is characterized by volatility over time, the DJIA follows an exponential growth pattern throughout the time-series linked to the rebalancing of its portfolio of companies that is strongly biased towards market performance. The Standard & Poor's 500 Index provides a broader spectrum of the performance of the U.S. economy given that it includes significantly more companies and eliminates the drawbacks of the DJIA. The S&P 500 is also retrieved from Bloomberg L.P., for which the first data point calculated was in January 1950 after which daily, weekly, monthly, and quarterly data are available. This amounts to 17231, 3573, 822 and 274 observation respectively.

Data on the U.S. Treasury Bill's rates was retrieved from the work of Robert J. Shiller (2016) which covers those rates since 1871. Finally, historical data on the gross domestic product of the U.S. was retrieved from the World Bank database.

The statistical analysis of this data was performed using SPSS and Excel. SPSS is used for the various tests conducted throughout this study including the tests for stationarity, the spectral analyses and the tests for normal distribution. Excel provides more agility in terms of manipulating the data and hence was used for determining and estimating turning points using sophisticated formulas in addition to studying cycle analysis as an investment strategy. We supplemented our review with XLStat, an add-on to Excel, that allowed us to extend the range of statistical analysis tools used in this paper.

B) Methodology

For the purpose of clarity, this section will be divided into the three individual parts of this research.

a) The ability of cycles to predict major turning points

To study the DJIA and S&P 500, we require that our data be stationary. Therefore we will transform our data using the standard techniques of first differencing and taking the logarithmic value of that data. Stationarity will subsequently be tested using the autocorrelation and partial autocorrelation functions in addition to a Dickey-Fuller test.

Having established the stationarity of our time series, we will then proceed to a spectral analysis of our data to determine the most appropriate cycles to study in the different time periods of the DJIA and S&P 500.

Any time series can be expressed as a combination of waves of differing periods and amplitudes. A spectral analysis exploits this fact to identify the underlying cyclical behavior of a time series. In order to do so, a spectral analysis simulates a series of waves with differing periods and tests the strength of the relationship between each individual wave and the time series. Those waves that best fit the oscillation in the time series data are those corresponding to the largest peaks in the spectral analysis.

Taking the principle cycles in our stationary data, we will proceed to study the probability that major turning points derived from our data coincide with those predicted by these selected cycles.

To begin, we determine the actual major turning points in the DJIA and S&P 500 which we will define as those significant pivot points that represent the highest or lowest prices on a rolling eight-period basis.

Thereafter, we will identify the date of predicted turning points by adding the cycle lengths to the dates of actual highs and lows previously identified commencing with the first historical turning point from our data set as our base date. We will adjust the cycle length, determined

in the spectral analysis, for the time-period considered whether daily, weekly, monthly or quarterly. Moreover, we will determine the exact date of the next expected turning point following a previous pivot point by converting weekly, monthly or quarterly cycles into the number of days to be added to the historical turning point.

Subsequently, we will use a formula to find the closest match between the estimated turning points and the actual turning points in the relevant time-period of the DJIA and S&P 500 and we will calculate the exact difference in days between the turning points projected by our cycles and the dates at which the closest turning points actually occurred. The difference in days will be converted to the relevant time-period to show daily, weekly, monthly and quarterly match of cycles.

To test the accuracy of our predictions made based on cycle analysis, we first look at the mean, standard deviation and kurtosis tests of the observed differences and evaluate whether they follow a normal distribution by conducting a Kolmogorov-Smirnov test (K-S test). The K-S test is a goodness of fit test which is used to decide whether a sample comes from a population with a specific distribution. In our case, the null hypothesis of this test is that the sample follows a normal distribution.

Having established the statistical accuracy of cycles to predict major historic pivot points in the DJIA and S&P 500, we proceed to the second part of this research:

b) The application of cycle analysis as an investment strategy

If the ability of cycles to predict major turning points has statistical significance, it should be possible to use those cycles in an investment strategy to generate a profit. We note that the aim of this part is not to outperform the market, as that is not mathematically feasible with exponential price action, but to illustrate that cycle analysis provides reliable and accurate information about market movement and hence can complement an investor's trading strategy. In order to test the profitability of using cycles as the basis of an investment strategy, we will use three independent applications.

The first application involves a simple strategy using the predicted turning points of a predetermined cycle to reevaluate our position in the DJIA.

The reevaluation of our position in the DJIA is based on the analysis of the trend in the years leading up to our predicted turning point. If we observe an upward trend, this will signal that we should have a long position and if there is a downward trend, this will indicate that we should have a short position. We consider an initial investment of $10,000 in June 1896 at the price of $36.15 and begin by calculating the equivalent number of units we possess at the start of our strategy. At the end of each cycle period, we take the initial number of units and multiply it by the price at the end of the cycle to determine the proceeds from trade during that cycle period. This process is carried out over all periods until the final period for which we deduct the initial investment amount of $10,000 from the cumulative proceeds from trade to establish the profitability of this strategy.

The second and third application involves comparing the returns of a strategy based on cycle analysis with those generated by random and risk-free strategies.

For the cycle analysis strategy, we determine trading dates according to actual and predicted turning points based on cycles. We choose the focal cycles based on the spectral analysis of the daily S&P 500 according to their mean difference and standard deviation from the actual data to maximize the accuracy of our analysis. Furthermore, we consider the output of the test for kurtosis in order to pick those cycles with the lowest number of outliers. The first step involves finding the actual major turning points that are determined based on whether they are the highest or lowest point in an eight-period interval. Subsequently, for each pivot point we use a predetermined cycle length to determine the closing date of our position and calculate the proceeds and profits from our strategy as before. In this manner, we will test three different investment strategies.

The first cycle analysis strategy allows the investor to take both long and short market positions. For this strategy, we assume that a historical pivot point represents a definitive change in market direction. If a point is determined as being a major high, then the strategy is to take a short position at that date and, conversely, if it is considered the lowest point, we take a long position. The second application involves a strategy in which we only take on long positions for which each turning point coincides with a buy signal on the basis that troughs signal an upward trend and peaks are consolidations that will later result in market accelerations. For the first two strategies, we restrict the trading allowance to a third of the outstanding cash balance on the trade date, having added back the proceeds from previous

completed trades. Indeed, given risk aversion, investors shield themselves from potential losses by only investing a fraction of their cash balance and 33% was found to be the average fraction for most investors (Kennon, 2018).

In the third alternative strategy, we take long positions at every major turning point and invest 75% of our cash balance. Even with such a higher trading capital, this investment strategy permits drawdowns and trading losses without leading to complete capital depletion. This strategy aims to maximize the potential returns that could be obtained using a long only strategy and is hence called the maximizer strategy.

For all three strategies, we consider an initial investment of $10,000 and we will not account for transaction costs or market slippage. The level of cash utilization and the individual strategy determines the number of S&P 500 units bought or sold by a simple formula looking at the nature of the pivot point, the amount of available cash on that date and the published close price of the index on that date. The closing date for the trade is the date corresponding to the sum of the pivot point date plus the cycle length or, if the market is closed on that day, then the next day the market is opened. On the close date, the original units bought or sold are sold or bought respectively at the close price for that day. The difference between the prices at open and close dates are compared to provide the trade profit or loss. This profit or loss is added or subtracted from the dollar amount of the opened trade to give the proceeds resulting from the close of the position on the settlement date. We add back the proceeds to the cash balance on the next market day following the close date. Thus, the subsequent trade amounts reflect the settled balances of previous trades.

As some trades, due to cycle lengths relative to pivot point dates, will not have been closed at the date of this paper, these are valued at close prices at the end of our trading period. In order to determine the net profit of the investment strategy, we subtract the original capital deposit of $10,000.

This process will be carried out for the seven most prominent cycles in the S&P 500 and we summarize the results.

In a first approach, we compare the results of our cycle analysis strategy with those of a random strategy.

A random strategy is representative of a situation in which an investor does not have a strategy and can be used as a benchmark to establish whether using cycle analysis, as an investment strategy, is more profitable than no strategy at all. For this application, we will also use the daily S&P 500 data starting from 3rd January 1950 until 25th June 2018.

The random strategy is based on dates that were randomly selected over the focal period and reordered chronologically. Similarly to above, we perform this strategy in three different manners using the same initial deposit of $10,000 and cash utilization criteria to be able to make consistent comparisons with the cycle analysis strategy.

The first random strategy approach involves a strategy in which the investor can take both long and short positions. The long and short approach involves generating randomly allocated chronological trading dates. As random number generation could mean that an initial or early trade is very close to the end date such that further trades cannot occur, we have taken the difference in days between our start and end date (25,010 days) and divided it by 80 to give a 312 day increment that approximates the number of trading days in a year. Therefore, the first trade date is the S&P 500 starting date (1/3/1950) plus a random number between 1 and 312 and the second date is determined as a random number, within the increment, added to the first trade date. Against each date, we randomly allocated a number between 1 and 8. For any date associated with a number strictly below 5, the investor takes a long position and for any date associated with a number greater or equal to 5, the investor takes a short position. These random trade dates are matched with the actual stock price nearest to that date, allowing for random selections landing on weekends or public holidays when the market is closed. For each randomly selected date on which we open either a long or short position, we generate another random date corresponding to the closing date for each position. The formula takes a random number between the open date plus 1 and the increment to covert to the close date. At the closing of each trade, the profits or losses are calculated based on the price movement during the trade period for the number of units, taking into account whether the position was long or short in the market. The profits or losses are added or subtracted to the initial trade amount to give the proceeds from that position. The proceeds are added to the cash balance on the next market day following the close date and subsequently used as the basis to invest in the following random trade. Profits are then determined as the difference between the cash balance after the closing of our last outstanding position and the initial

$10,000 balance. We repeat this random process fifteen times and compute a summary table of the results.

The second random strategy approach involves the possibility of only buying for the investor, the long only strategy. Here, each randomly selected date corresponds to a long signal for the investor that is closed on a randomly selected date and recorded in the same manner as the previous approach. The final random strategy replicates the maximizer strategy by the restriction of trades to long positions only for which 75% of the cash balance is utilized for each trade. The methodology remains the same as the above long only strategy.

Finally, the third application involves a comparison of the return from risk-free money against the returns of strategies based on cycle analysis.

The strategy in which a risk-averse investor places all his money into treasury bills to earn a risk-free return is representative of a situation in which an investor avoids risk entirely and is used as a benchmark to establish whether our strategies of investing in a volatile stock market based on cycle analysis is better than the safe option of returns from Treasury Bills. Our study of risk-free return will be based on ten-year treasury bills. We assume the investor can reinvest all his proceeds in a treasury bill, without transaction costs, for the following year to generate a compounded result and the value of the treasury bills remain at par throughout the focal period. In order to achieve a reliable comparison with the cycle analysis strategies, our investment in the risk-free return will start in 1950 with $10,000. With regards to the cycle analysis comparison, we will compare the risk-free results to the three different strategies used in our previous analysis. Namely, a long and short strategy, a long only strategy and a maximizer strategy.

c) Interference and economic cycles

The phenomenon of interference refers to the superposition of multiple waves to form a resultant wave of greater, lower, or equal amplitude. Interference generally occurs when waves are correlated or coherent with one another either because they originate from the same source or as they operate at similar frequencies. When in phase, waves create constructive interference which results in a wave of greater amplitude. When out of phase, waves create destructive interference and generate a wave of lower amplitude. We aim to

show that by adding the occurrences of cycles in the DJIA and S&P 500, there is a definitive correspondence of high frequency cycle dates with both stock market price moves and economic cycles. Thus, the evidence of high frequency cycle dates could be useful to predict economic events of boom and bust in the U.S. economy.

To study the concept of interference using our economic cycles in the DJIA and S&P 500, we will determine the number of cycle occurrences measured from the actual pivot points that we derived in the previous sections. To do so, we will consider those cycles for which the standard deviation and mean difference between predicted and actual turning points is closest to zero in addition to those cycles with the smallest number of outliers as determined by the test for kurtosis. For the DJIA, we will consider monthly, quarterly and weekly cycles. The S&P 500 will consider the occurrences derived from all time frames including daily.

In this part we aim to determine whether those major pivot points in cycles that have successfully matched turning points in the past can also be used as the starting point to estimate future market action as characterized by a change in the direction or an acceleration of the stock market prices.

To eliminate the noise caused by those minor cycles that fall in most 6 monthly-bin distributions and the surge in cycles observed in the later periods of our time-frame, we will consider the number of counts compared to a moving average of frequencies. This moving average is based on the frequency in the three six-monthly periods before and one after the current period. Noise is considered as those cycle counts for which the frequency is below the moving average and that are subsequently removed from our analysis. This allows us to extract the most significant frequencies of cycle counts to match the major turning points and market accelerations.

To reflect that certain cycles outperform others with regards to the considered statistical indicators, we will weight the frequency counts of each cycle relative to the following function:

$$W = (100-(Mean^2 + Sqrt(Abs(St\ Dev)) + Kurtosis))/100$$

Furthermore, we apply another weight to account for the fact that the significance of longer cycles (quarterly, monthly & weekly) tends to be undermined given the prevalence of shorter daily cycles. To correct for this, we apply the following formula:

$$W^* = W \times Y/X$$

Y: Number of Day Highs & Lows (HLs) for the S&P 500; Number of Week HLs for the DJIA
X: Number Quarter HLs; Number of Month HLs; Number Week HLs

Having weighted each cycle appropriately, we will proceed to predict the future turning points based on the convergence of the three most statistically relevant cycles in the DJIA and S&P 500 for each of the daily, weekly, monthly and quarterly data as appropriate. For each historical pivot point from our dataset of major highs and lows, we will regenerate predicted turning points by adding the cycle lengths to that pivot point. This is repeated with the new turning point until the computed date is greater than 06/30/2019. Hence every turning point will serve as a source for the prediction of new turning points under the implicit assumption that cycles do not decay or lose their amplitude over time.

To compute the cycle frequency table for the entire period of study, we will establish the number of turning points predicted to occur in bin distributions of six-month intervals as arrays, commencing in 6/30/1950 until 6/30/2018. A six-month bin is selected as it provides a sufficient timeframe in which to observe the interference of cycles given that we consider long quarterly cycles in our analysis and, in addition, to providing flexibility with regards to the standard deviations in our cycles. We will chart the consolidated significant frequencies for each time-period.

In order to demonstrate the interference of cycles relating to different time periods, in the case of the S&P 500, we will add the daily cycle frequencies to those of the weekly, monthly and quarterly data to generate one chart showing the most significant cycle counts. Again, noise and minor cycle counts will be eliminated using the methodology above based on moving averages. The frequency of cycle counts will be measured against a logarithmic value of the S&P 500 to retain the importance of highs and lows in the earlier periods of our timeframe. We will establish the degree of accuracy that the cycle counts match the S&P 500 market price action to determine their overall validity. A high correlation between the two would indicate that the phenomenon of interference is prevalent in cycle analysis within the S&P 500.

We will repeat the exercise for the DJIA by adding the weekly, monthly and quarterly cycle frequencies and comparing those results to the DJIA in a similar fashion as performed with the S&P 500. A high correlation between the two would indicate that the phenomenon of interference is prevalent in cycle analysis within the DJIA. As daily data in the DJIA is insufficient for longer-term cycle analysis, we use weekly data as our reference for the relative weighting of quarterly and monthly cycles.

Next, we will combine the cycles of the DJIA and S&P 500 to analyze the effect of interference of a combination of cycles across markets and time periods. As in previous stages, we will use a 4-period moving average to further refine our cycles. Additionally, we will balance the cycle counts between the two data sets as the DJIA provided significantly more counts than the S&P 500. This is explained by the longer data set of the DJIA with 50 more years of data. To achieve this, we will eliminate derived counts of 2.5 and below for the S&P 500 and 5.5 and below for the DJIA.

As a final exercise, we will combine the S&P 500 and DJIA cycles to determine whether the interference of these cycles derived from both time-series correspond to major peaks and troughs in the quarterly changes in GDP of the U.S. economy. A high correlation between our cycle analysis output and GDP would indicate that the phenomenon of interference is prevalent in cycle analysis and would be suggest its application in future research. We will also include a study of the inter-correlation of the S&P 500 and DJIA and quarterly changes in GDP rates. In order to make such comparisons, we will calculate the quarterly changes in the S&P 500 and DJIA which will subsequently be normalized by the following factor:

$$N = \text{Max(S\&P 500 quarterly change)} / \text{Max(GDP quarterly change)}$$

Furthermore, in calculating the combined data sets, we will make two further reductions on the number of cycle counts selected: the first will be by comparing the summation of the time period frequency counts to a moving average, in the same manner as performed previously; and the second will be through the selection of a minimum count of cycles in a 6-month period for each data set for that period to be accredited as a valid cycle, which will also balance the relative importance of the DJIA with the S&P 500.

IV. Results

a) The ability of cycles to predict major turning points

Figure 1 presents the price level for the DJIA from October 1896 until June 2018. This time series is characterized by an obvious positive trend and hence must be adjusted to correct for non-stationary. We observe that both the mean and variance of this series vary over time which more specifically indicates that the time series has a stochastic trend. This can be corrected for in a first stage by taking the first difference of the series.

Having taken the first difference of the series, we managed to obtain a constant mean but the variance remains an increasing function of time. Indeed, the variation from the mean is significantly lower in the earlier period of the time series than for the more recent price levels. In order to achieve variance stationarity, we will use the first difference of the logarithm of the DJIA.

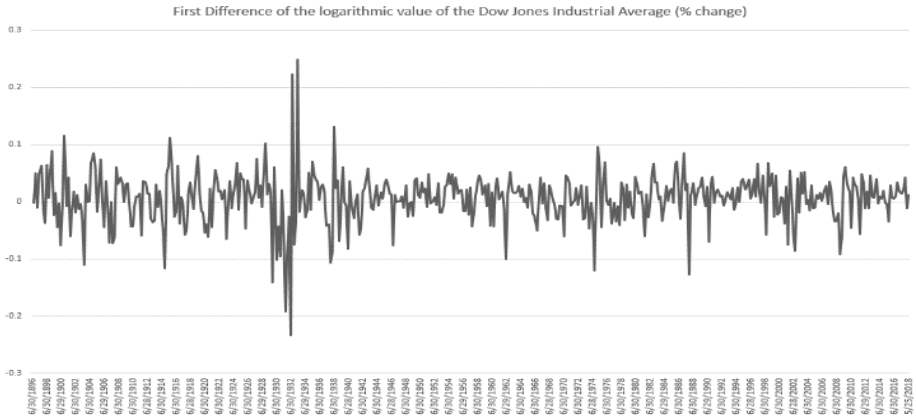

Figure 2: First Difference of the logarithmic value of the Dow Jones Industrial Average (%)

The series that we observe in Figure 2 now appears to meet the two conditions for stationary. Firstly, the series fluctuates around a constant mean over time. Secondly, the variance is approximately uniformly distributed. However, before we make any inferences about the stationarity of our time series, we will plot the autocorrelation function (ACF) and partial autocorrelation function of the first difference of the logarithmic value of the Dow Jones Industrial Average (1logDJIA) using SPSS.

In Figures 3 and 4, we discern that the respective functions both converge to zero geometrically which signals that the series is stationary (Enders, 1995). This is further supported by the output of the Dickey-Fuller test shown in Table 1. This test indicates a p-value inferior to the 5% significance level meaning that we reject the null hypothesis that the series has a unit root. Therefore, our DJIA series is stationary.

We conduct a similar analysis with the S&P 500 as we begin by transforming the data by taking the first difference of the logarithmic value of the S&P 500 and testing the stationarity of our time series. From the output of the Dickey-Fuller test presented in Table 2 we find a p-value inferior to the 5% significance level meaning we reject the null hypothesis that the series has a unit root and, therefore, conclude that our S&P 500 series is stationary. From the daily S&P 500 data, we extract the weekly, monthly and quarterly data further used in our analysis. Thus, all time series are considered stationary.

Having established that our time series are stationary, we can begin to analyse the data. We first proceed to a spectral analysis of the different time-series used for both the DJIA and S&P 500 in order to determine the most appropriate cycles to study for each time series.

Table 3 exhibits the different cycles present within the DJIA for the quarterly, monthly and weekly time-series. From the output of Figure 5, the three principal peaks for quarterly time series correspond to frequency levels (F) of 0.0033919, 0.008933 and 0.0224229. Given that the number of periods (T) equates to: T=1/F, we can establish that those cycles that best fit the oscillation in the quarterly DJIA correspond to 295, 112 and 41 quarters. Furthermore, from the output of the monthly DJIA spectral analysis in Figure 6, we find that the major peaks correspond to 463, 177 and 127 months. Finally, for the weekly DJIA, the best fitting cycles relate to 348, 131 and 109 weeks.

Table 3: Principal results of spectral analyses for different time periods – DJIA

		QUARTERLY							
Spectral Analysis	(F)	0.003391909	0.00893368	0.01242295	0.02145399	0.0244354	0.03264543	0.04906551	0.06343307	0.07287461
Equivalent in quarters	(T)	294.8	111.9	80.5	46.6	40.9	30.6	20.4	15.8	13.7
Equivalent in years		73.7	28.0	20.1	11.7	10.2	7.7	5.1	3.9	3.4
		MONTHLY								
Spectral Analysis	(F)	0.002160403	0.00564967	0.00790743	0.00954944	0.01201245	0.01611746	0.02494325	0.02966402	0.04156858
Equivalent in months	(T)	462.9	177.0	126.5	104.7	83.2	62.0	40.1	33.7	24.1
Equivalent in years		38.6	14.8	10.5	8.7	6.9	5.2	3.3	2.8	2.0
		WEEKLY								
Spectral Analysis	(F)	0.00287026	0.0057473	0.0076269	0.00918485	0.01549931	0.02640613			
Equivalent in weeks	(T)	348.4	174.0	131.1	108.9	64.5	37.9			
Equivalent in years		6.7	3.3	2.5	2.1	1.2	0.7			

Similarly, we perform a series of spectral analyses on the quarterly, monthly, weekly and daily S&P 500 time-series. (Figure 8-11) We observe for the daily S&P 500 that the underlying cycles correspond to periods of 862, 632, 510, 376 and 278 days. For the weekly S&P 500, we find that the major peaks correspond to cycles of 386, 215, 176, 102 weeks. Furthermore, the spectral analysis of the monthly S&P 500 indicates the presence of 85, 53, 43, 24, 5 and 4 month cycles whilst for the quarterly S&P 500, the underlying cycles are 125, 29, 27, 16 and 14 quarters.

Table 4: Principal results of spectral analyses for different time periods – S&P 500

		QUARTERLY					
Spectral Analysis	(F)	0.0080264	0.0374149	0.0632765	0.071897	0.071897	0.0345
Equivalent in quarte	(T)	124.6	26.7	15.8	13.9	13.9	29.0
Equivalent in years		31.1	6.7	4.0	3.5	3.5	7.2
		MONTHLY					
Spectral Analysis	(F)	0.0118283	0.0190121	0.0231171	0.0415897	0.1862915	0.2376043
Equivalent in month	(T)	84.5	52.6	43.3	24.0	5.4	4.2
Equivalent in years		7.0	4.4	3.6	2.0	0.4	0.4
		WEEKLY					
Spectral Analysis	(F)	0.002592	0.0056707	0.0097758	0.004644		
Equivalent in weeks	(T)	385.8	176.3	102.3	215.3		
Equivalent in years		7.4	3.4	2.0	4.1		
		DAILY					
Spectral Analysis	(F)	0.0011602	0.0015815	0.0019607	0.0026585	0.0031922	0.0036027
Equivalent in weeks	(T)	861.9	632.3	510.0	376.1	313.3	277.6
Equivalent in years		16.6	12.2	9.8	7.2	6.0	5.3

We notice that several of the underlying cycles found in the DJIA and S&P 500 align with the findings of previous research on cyclical patterns in financial markets including cycles that affirm Juglar's 10-year cycle, Kitchin's 3-5 year cycle, Kuznets' 15-25 year cycle and, particularly, their respective harmonics.

Having established the underlying cycles in our stationary datasets, we will now proceed to study the probability that these cycles intersect with major turning points in our data and determine the most statistically significant cycles for each time-series in the DJIA and S&P 500.

We will define a major turning point as the highest high or lowest low of the last 4 periods and following 4 periods. Applying this condition for all time-series of the DJIA and S&P 500, we obtain the list of pivot point dates shown in Tables 5-27.

Next, we shall use the relevant cycle lengths found previously in the spectral analyses to estimate the exact day of the following major turning points in our data using the first pivot point in each time-series as the base date. Therefore, for each pivot point we add the relevant cycle length in days to calculate the exact predicted next turning point. We repeat this for each cycle and for each time-period. This will give a list of dates for each time-series of the DJIA and S&P 500 for which we would expect to find a turning point at the end of the first iteration of a cycle ceteris paribus.

Subsequently, we find the closest match between the estimated turning points and the actual pivot points in the DJIA and S&P 500. To do this, we apply a formula to determine the closest match to a pivot point date in our index for that time series by selecting the pivot point that has the lowest absolute difference in the number of days from the expected turning point. Hence, Tables 5-27 show the actual turning point that is closest to the corresponding data point estimated by our cycles. We then proceed to calculate the difference between the turning points projected by our cycles and the dates at which the closest turning points actually occurred. We notice both positive and negative differences indicating that our formula is selecting the closest match before or after the expected turning point.

The differences between datasets form the basis of our statistical analysis to test the robustness of the different cycles of the time periods in both the DJIA and the S&P 500.

To begin, we look at the mean of the observed differences and notice for both the DJIA and S&P 500 that they approximate zero for all considered cycles (Tables 28-29). This indicates that on average the actual pivot points in the DJIA and S&P 500 have occurred on the dates predicted by our different cycles. When studying the standard deviation of mean differences,

they tend to be relatively high which is reflective of a dearth of pivot points across certain periods of time in exponentially increasing markets. Indeed, upon analyzing the list of actual pivot points in the DJIA and S&P 500, we find that, for example, from 1990-2000 there are only three detected pivot points in our data. Such instances may be explained by converging cycles to lead to an acceleration of price action, which will not show up as turning points. Relative to the sample size of our different time-series, the respective kurtosis figures are generally low, indicating a small numbers of outliers.

Table 28: Descriptive Statistics of the observed difference between actual and predicted turning points in the DJIA

	QUARTERLY								
Quarterly Cycle	294.8	111.9	80.5	46.6	40.9	30.6			
Mean	0.3263	-0.4681	0.2886	-0.2094	-0.9443	0.0294			
Standard Deviation	2.8450	3.9296	3.3265	4.0205	3.8757	3.6104			
Kurtosis	9.9	5.3	6.7	2.8	4.7	3.2			
	MONTHLY								
Monthly Cycle	462.9	177.0	126.5	104.7	83.2	62.0	40.1	33.7	24.1
Mean	0.6573	0.0583	-0.1808	-0.1156	0.4585	0.1587	-0.4872	-0.2155	0.2820
Standard Deviation	4.1421	4.6411	4.3434	4.4655	5.2035	4.7003	5.0455	4.3364	5.1113
Kurtosis	3.5	1.8	2.4	2.5	1.6	1.6	1.9	1.8	1.5
	WEEKLY								
Weekly Cycle	348.4	174.0	131.1	108.9	64.5	37.9			
Mean	-0.1000	-0.4489	-0.0891	-0.1901	0.3987	-0.3085			
Standard Deviation	3.5167	3.4293	3.7631	3.4999	3.7799	3.6359			
Kurtosis	3.2	3.6	3.0	2.2	2.5	2.2			

Table 29: Descriptive Statistics of the observed difference between actual and predicted turning points in the S&P 500

	QUARTERLY					
Quarterly Cycle	124.6	26.7	15.8	13.9	13.9	29.0
Mean	1.4647	1.1187	0.3113	-0.7166	-0.7166	0.0526
Standard Deviation	5.1067	3.4948	4.3541	4.5396	4.5396	3.3726
Kurtosis	2.0	1.3	2.3	3.0	3.0	0.3
	MONTHLY					
Monthly Cycle	84.5	52.6	43.3	24.0	5.4	4.2
Mean	0.0355	0.0178	0.5767	0.4973	-1.3656	-1.3964
Standard Deviation	4.6248	4.2539	5.1226	5.2333	3.2748	2.7206
Kurtosis	1.5	3.0	3.5	2.5	-1.1	-1.3
	WEEKLY					
Weekly Cycle	385.8	176.3	102.3	215.3		
Mean	0.7597	1.9745	-0.8867	-0.3136		
Standard Deviation	18.3437	21.3516	19.4169	22.1399		
Kurtosis	2.9	2.7	3.2	2.5		
	DAILY					
Daily Cycle	861.9	632.3	510.0	376.1	313.3	277.6
Mean	-3.6612	0.9560	-9.7644	1.7872	-3.0012	-5.7066
Standard Deviation (T)	93.313	91.259	85.245	84.155	88.146	86.527
Kurtosis	1.6	2.3	1.0	2.9	1.3	0.8

When comparing the results of the DJIA to the S&P 500, we find that the quarterly and weekly results of the DJIA are consistently better than the S&P 500 in terms of the means

and standard deviation being minimized. However, the equivalent kurtosis figures suggest that the DJIA quarterly and weekly data sets have larger number or outliers, perhaps reflecting the greater exponential increase of the DJIA to that of the S&P 500 due to the rebalancing of the former.

Moreover, by plotting the distribution of the observed differences, we observe that they approach a normal distribution (Figures 12-57). To test the hypothesis that these samples do follow a normal distribution, we conduct a Kolmogorov-Smirnov test (K-S test). Table 30 shows the results of this test for the DJIA and we see that the null hypothesis cannot be rejected for the quarterly and weekly distributions but is rejected for the 85, 53 and 24 month cycles. However, when we remove the 10 largest outliers from each of the monthly datasets, we obtain a result for which we cannot reject the null hypothesis of the Kolmogorov-Smirnov test for the 85 and 53 month cycles (Table 31). The inability to reject the null hypothesis supports our initial belief that the observed differences follow a normal distribution. With regards to the results of the K-S test for the S&P 500 shown in Table 32, we cannot reject the null hypothesis that these cycles follow a normal distribution for all but the 16-week and 53-month cycle. When we remove the 10 largest outliers from these two cycles, we also cannot reject the null hypothesis of the Kolmogorov-Smirnov test for the 53-month cycle (Table 33).

Based on these findings, we can conclude that turning points in the Dow Jones Industrial Average and Standard & Poor's 500 indices can be predicted using cycles analysis based on the output of a spectral analysis. In addition, the output of both the various spectral analyses and descriptive tables point to certain predominantly accurate and important cycles for each time-series. Namely, the 81, 47 and 31 quarter cycles; 177, 105 and 62 month cycles in addition to the 348, 131 and 109 week cycles for the DJIA. For the S&P 500, these correspond to the 125, 27 and 16 quarter cycles; the 85, 53 and 24 month cycles; the 386, 102 and 215 week cycles and finally the 862, 632 and 376 day cycles.

b) The application of cyclical analysis as an investment strategy

In order to test the profitability of using cycles as the basis of our investment strategies, we will conduct three independent analyses:

1. A simple strategy using the predicted turning points of a 28-year cycle to reevaluate our position in the DJIA.

2. A comparison between the returns of a random strategy against the return of a strategy based on cycle analysis.
3. A comparison between a risk-free return against the return of a strategy based on cycle analysis.

1. The 28-year cycle strategy

The 28-year cycle has been found to coincide with political and financial crises around the world, starting with the American revolution in 1765. 28 years later saw the economic upheaval of the French Revolution (1793) followed by the Greek Revolution against the Ottoman Empire and Panama and Peruvian war of Independence against Spain in 1821. 28 years later Russia declared war on the Ottoman Empire (1877) before entering into a crisis of its own marked by devastating famines and violent uprisings in 1905. In 1933, the U.S. saw the highest level of unemployment in its history and experienced the worst of the Great Depression. 28 years later in 1961, the Cuban Missile Crisis and Vietnam War began before the Savings and Loan Crisis hit the U.S. and the Berlin Wall came down in 1989. (Dent & Pancholi, 2017). Furthermore, the 28- year cycle was detected from the output of our spectral analysis and demonstrated the lowest mean, standard deviation and kurtosis results for its time series.

Our data starts in 1896 for which takes us to the next 28-year cycle in 1905. Thereafter, we follow the historic timeline of the 28-year cycle and generate a series of predicted turning points at intervals of 112 quarters following 1905. Figure 58 presents the five predicted turning points at which we will reevaluate our position.

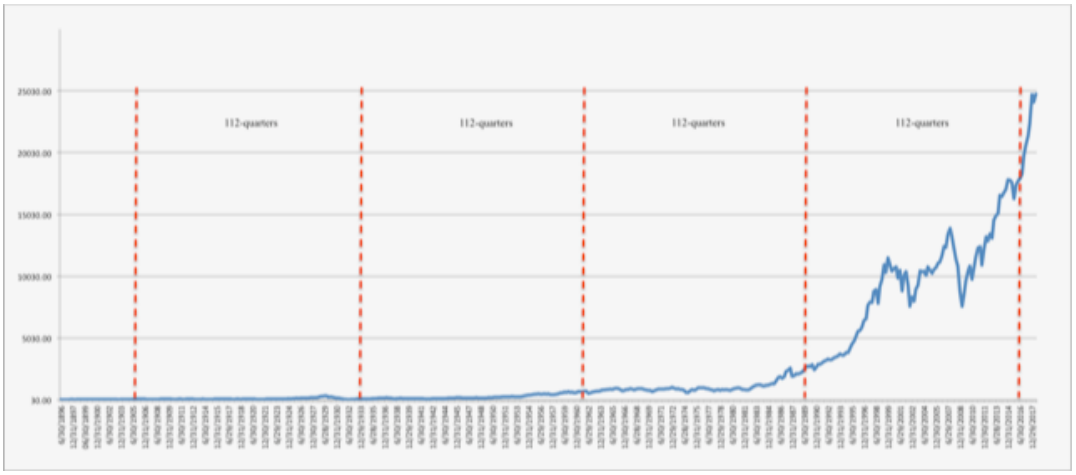

Figure 58: 112-quarter cycles in the DJIA

The reevaluation of our position in the DJIA is based on the analysis of the trend in the years leading up to our predicted turning point. Figures 59-62 illustrate the price and market trend for the periods prior to the four predicted turning points whilst Figure 63 presents the trend of the ongoing 28-year cycle. For each 112-quarter cycle, we observe an upward trend which according to our investment strategy, indicates that we maintain a long position in the DJIA in the next the focal period. Table 34 presents the return of this strategy. Given an initial investment of $10,000, we generate an overall profit of $5,895,845. The 28-year cycle strategy is thus an effective strategy to highlight major turning points on which to re-evaluate our trading position given we capture the long-term gains of investing in the Dow Jones Industrial Average.

	Price	Cumulative Profit
6/30/1896	$ 36.15	$ -
6/30/1905	$ 76.87	$ 11,264.18
6/30/1933	$ 98.14	$ 17,147.99
6/30/1961	$ 683.95	$ 179,197.79
6/30/1989	$ 2,440.06	$ 664,982.02
6/30/2017	$21,349.63	$ 5,895,845.09

Table 34: Return of 28-year cycle strategy

2. Random strategy vs. cycle analysis strategy

The random strategy is used to reflect the situation in which an investor does not possess a defined strategy and thus represents a benchmark to establish whether using cycle analysis as an investment strategy is better than no strategy at all.

Tables 35-40 show the results of individual trades for the three different approaches used across the cycle and random strategies. A summary of the performance of the cycle analysis strategies against the returns of the random strategies is summarized in Table 41.

Table 41: Summary of the results of the cycle analysis and random strategy

LONG/SHORT TRADE 33% OF BALANCE

	RANDOM	STRATEGY	DIFFERENCE	BEST RESULT 376 days
Profit/(Loss)	$ 879.06	$163,186.24	$ 162,307.18	$ 196,710.78
Winners	86	107.2857143	21	107
Losers	69	49.57142857	-20	50
Total Trades	157	157	0	157
Largest Winner	$ 284.20	$ 22,300.93	$ 22,016.73	$ 12,595.60
Largest Loser	$ -265.52	$ -7,096.94	$ -6,831.41	$ -4,853.90
Average Profit/Loss	$ 5.66	$ 1,063.30	$ 1,057.64	$ 1,281.04

LONG ONLY TRADE 33% OF BALANCE

	RANDOM	STRATEGY	DIFFERENCE	BEST RESULT 862 days
Profit/(Loss)	$ 3,478.90	$160,984.93	$ 157,506.03	$ 349,343.18
Winners	104	109	5	124
Losers	52	47	-4	33
Total Trades	156	157	1	157
Largest Winner	$ 992.39	$ 21,398.25	$ 20,405.86	$ 21,398.25
Largest Loser	$ -761.49	$ -11,332.21	$ -10,570.72	$ -9,442.04
Average Profit/Loss	$ 22.53	$ 1,041.15	$ 1,018.62	$ 2,269.07

MAXIMISER LONG ONLY TRADE 75% OF BALANCE

	RANDOM	STRATEGY	DIFFERENCE	BEST RESULT 376 Days
Profit/(Loss)	$ 5,722.06	$403,393.07	$ 397,671.01	$ 798,959.64
Winners	105	109	4	105
Losers	52	47	-5	52
Total Trades	158	157	-1	157
Largest Winner	$ 3,791.61	$ 93,515.12	$ 89,723.50	$ 92,059.97
Largest Loser	$-1,611.26	$ -55,195.84	$ -53,584.58	$ -24,474.99
Average Profit/Loss	$ 36.67	$ 2,622.12	$ 2,585.45	$ 5,204.36

With regards to the long/short approach, we find that our cycle analysis strategy outperforms the average return of the random strategy by $162,307 with a respective 68% profitability rate against 55%. It is noted that the use of the increment of 312 days in the random tests generated the same number of trades than occur in the cycle analysis strategies. Furthermore, we find that the average profit per trade and largest profitable trade yield a higher return under the cycle analysis strategy with a positive difference of a $1,057 per trade and $22,017 for the comparative most profitable trade of the random strategy. The optimal cycle analysis strategy was found to be for the 376-day cycle with a notional profit of $196,711 under the long/short approach.

Moreover, our cycle analysis strategy yields a profit $157,506 higher than the random strategy under the long only approach. In contrast to the long/short exercise, the profitability ratios of both strategies are closer to one another at 67% random strategy and 70% for the cycle analysis strategy. Whilst the largest winner is larger in the long only approach compared to the long/short approach for the random strategy, the cycle analysis strategy still provides the most profitable trades with a largest winner $20,406 greater than the random strategy and an average profit per trade $1,018 higher. The optimal cycle analysis strategy was found to be for the 862-day cycle with a generated notional profit of $349,343 equivalent to over 10 times that of the random strategy under this approach.

Both the random and cycle analysis strategies demonstrated more profitable results for the maximizer approach whilst also generating the largest differences between both strategies. Indeed, the difference in profits is 2.9 times greater on average than the differences in profits for the previous approaches at $397,671. Whilst the rate of profitability is similar between both strategies, the average profit per trade is $2,585 greater for our cycle analysis strategy in addition to the largest winner being $89,724 higher. Under this exercise, our optimal cycle analysis strategy was once again found for the 376-day cycle with, this time, a notional profit of $798,760 compared to the average of $5,722 for the random strategy.

Given these results, we can conclude that a cycle analysis strategy provides higher returns and a higher winning trade ratio than the random strategy irrespective of the approach and, hence, that using an investment strategy based on cycle analysis is significantly preferable than having no strategy at all.

3. Risk-free return vs. cycle analysis strategy

The strategy in which the investor places his money into treasury bills to earn a risk-free return is representative of a situation when an investor prefers not to invest in the stock market. It is used as a benchmark to establish whether investing in a volatile stock market using an investment strategy based on cycle analysis is better than not investing at all in the stock market. We find that the return of such risk-free strategy amounts to $394,706 having re-invested an initial $10,000 in ten-year treasury bills each year since 1950 (Figure 64). This high return can partly be explained by the rise in treasury bill rates between 1970 and 1990 which averaged 8.9% in comparison to 1.5% today. Moreover, such return is also related to

the assumption of re-investment of principal and cumulative coupons in a new treasury bill each year. In practice, the transaction costs including the premium over par valuation of treasury bills and the spread between selling and buying instruments annually would eliminate a significant element of the coupon (Williamson & Masten, 1999).

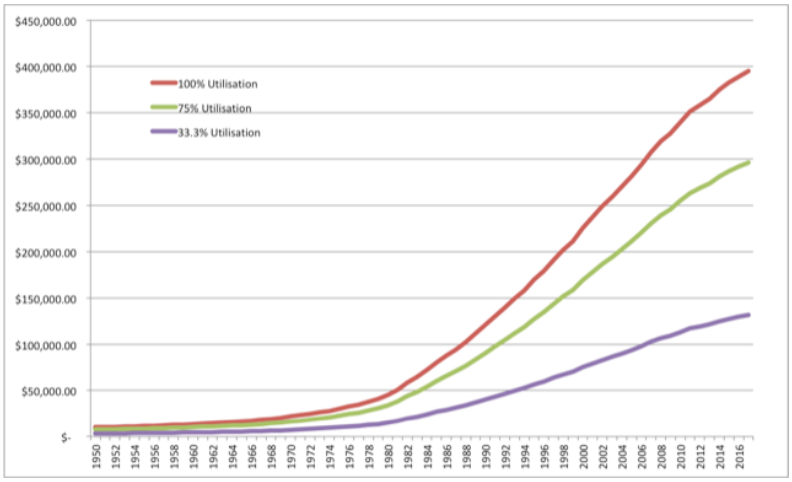

Figure 64: Return of risk-free strategy

We compare the return of the risk-free strategy to the performance of the cycle analysis based on the S&P daily cycle strategies for the long/short, long only and maximizer approaches as illustrated in Figures 65-79. A comparison of the returns for both strategies across the different approaches is summarized in Figures 80-94. According to these results, the cycle analysis strategy only outperforms the return from the risk-free strategy for the maximizer approach. Indeed, we find a closing balance for the maximizer scheme of $752,282 for the 862-day cycle, $466,981 for the 632-day cycle and $808,960 for the 376-day cycle strategies. However, the 510 and 277-day cycle maximizer strategies fail to outperform the risk-free strategy.

It should be noted that this comparison is based on the implicit assumption that 100% of the capital available is invested as opposed to our other cycles analysis strategies that restrict the asset purchases to 33% or 75% of the capital available. When comparing like-to-like, all cycle analysis maximizer strategies outperform the return of the risk-free strategy when restricted to a 75% trading allowance and only the 277-day long only cycle analysis strategy fails to outperform the 33% risk-free return strategy.

Similarly to above, we find that the long only scheme is more profitable the long/short alternative suggesting that cycle analysis needs to be used in coordination with technical analysis in order to optimize returns in an increasing market as proven in this example.

Therefore, despite the high return of the risk-free strategy given the assumptions made in this analysis, we can conclude that a strategy based on cycle analysis can be more profitable than not investing in the stock market when used in conjunction with technical analysis and a sufficient trading allowance of the cash balance.

c) The theory of interference in economic cycles

In order to study cyclicity in economic performance, we will now proceed to establish the correlation between important turning points predicted by cycle interference and the market action of the DJIA, S&P 500 and quarterly change in U.S. GDP. We will use the results of our previous analysis of the descriptive statistics and spectral analyses of cycles in the DJIA and S&P 500 to consider only those that are the most accurate and important. These cycles are summarized in Table 42 for the DJIA and Table 43 for the S&P 500.

Table and 14 also illustrate how each cycle has been weighted both within their time-period according to their statistical importance, as shown by the relative weighting, and between time-periods based on the number of observations relative to the weekly data for the DJIA and daily data for the S&P 500 as shown by the combined weighting.

Amongst the quarterly DJIA data, we observe that the 46.6 cycle is the statistically strongest with the lowest combination of mean difference, standard deviation and outliers as illustrated by the high relative weighting of 0.9519. For the monthly DJIA data, we find that this corresponds the 62-month cycle with a relative weighting of 0.9617 whereas for the weekly data, it is the 109-week cycle.

With the regards to the S&P 500, the statistically strongest cycles are the 27-quarter cycle, the 85-month cycle, the 215-week cycle and 632-day cycle.

Figure 95 shows the results, after the elimination of all insignificant and minor cycles, of cycle interference in the DJIA through a frequency table of the combined weighted cycles in

comparison with the market price action of the index. Given the exponential nature of the DJIA, we expect to see that the interference of cycles corresponds to several instances of price continuation and acceleration. It can be seen in Figure 96 that the cycles correspond to at least 11 major turning points, 8 major price accelerations and several minor events. Indeed, only 6 of the 43 combined cycle counts do not correspond to any obvious market action in the DJIA.

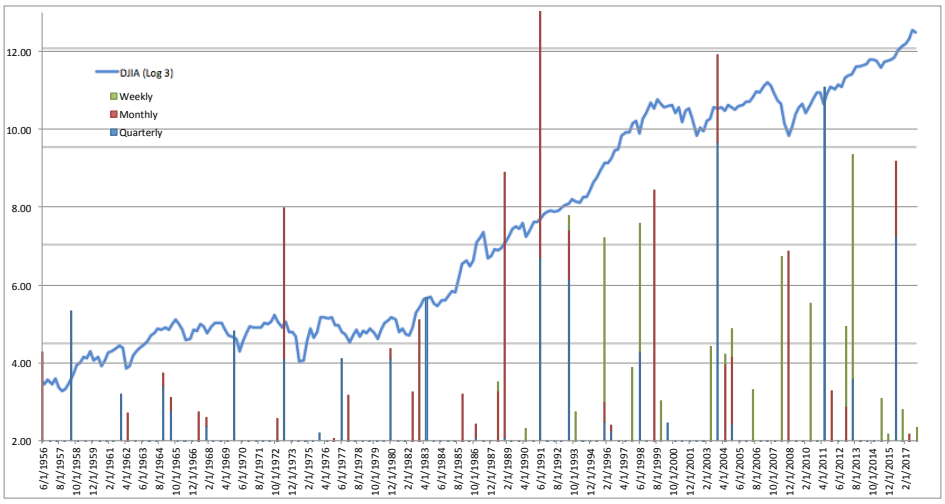

Figure 95: Combined weighted cycle counts for the DJIA with the DJIA index

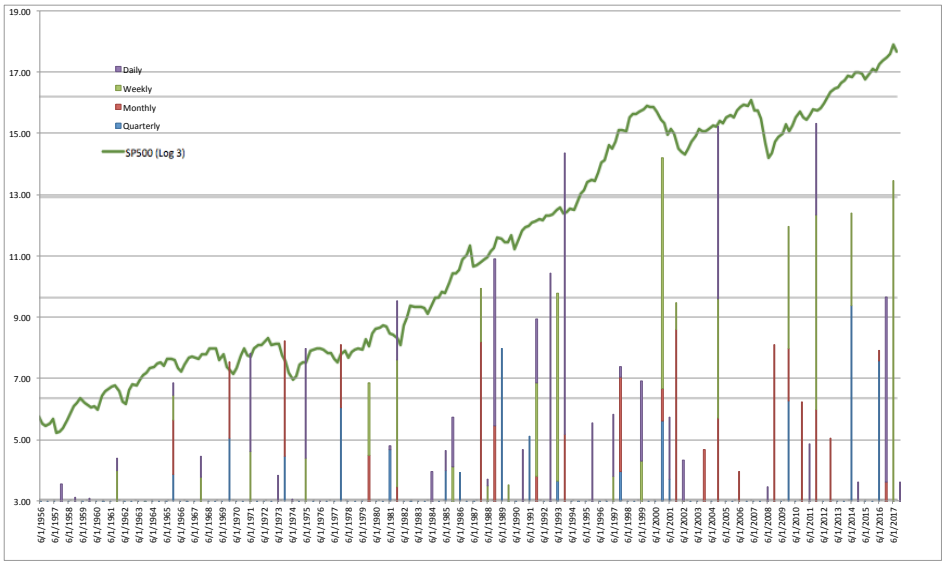

Figure 97: Combined weighted cycle counts for the S&P 500 with the S&P 500 index

Figure 97 shows the results of the same analysis conducted on the cycles of the S&P 500 index. We find that most of the significant aggregated cycle frequency peaks coincide with

pivot points or accelerations in the price action of the S&P 500 with an 85.4% correlation in major and minor market movements (Figure 98).

This implies that cycles of a same index can be aggregated to accurately forecast significant market movements within that index.

Next, we test whether the same conclusion holds when aggregating cycles of different indices as we combine the frequency of cycle counts of our previous analysis of the DJIA and S&P 500. Figure 99 illustrates the results of this exercise. Firstly, we notice a high symmetry between the movements of both indices over the focal period. A large correlation increases the significance of cycle interference through the superposition of price movements from both indices. Indeed, we observe that 21 of the 25 aggregated cycle counts match turning points and price accelerations in the indices indicating that cycles of highly correlated indices can be combined and aggregated to generate meaningful projections of the occurrence of important price movements.

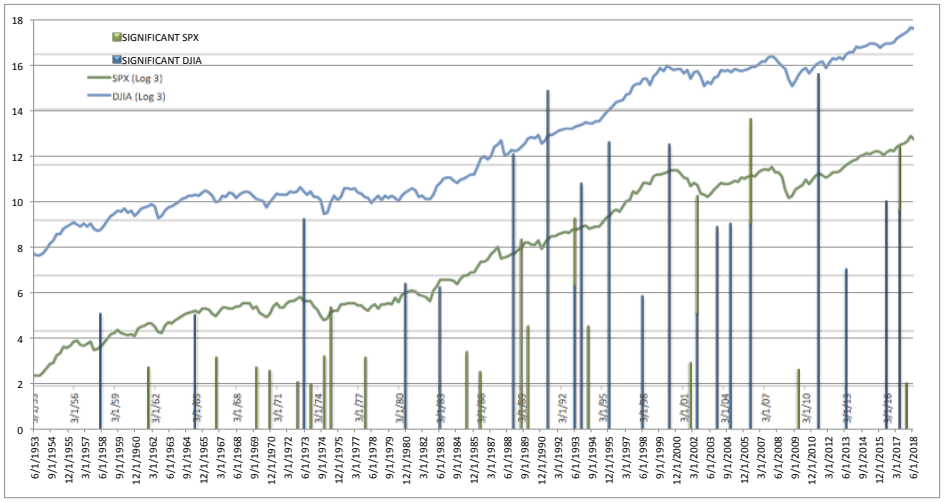

Figure 99: Significant combined weighted DJIA and S&P 500 cycle counts with their respective indices

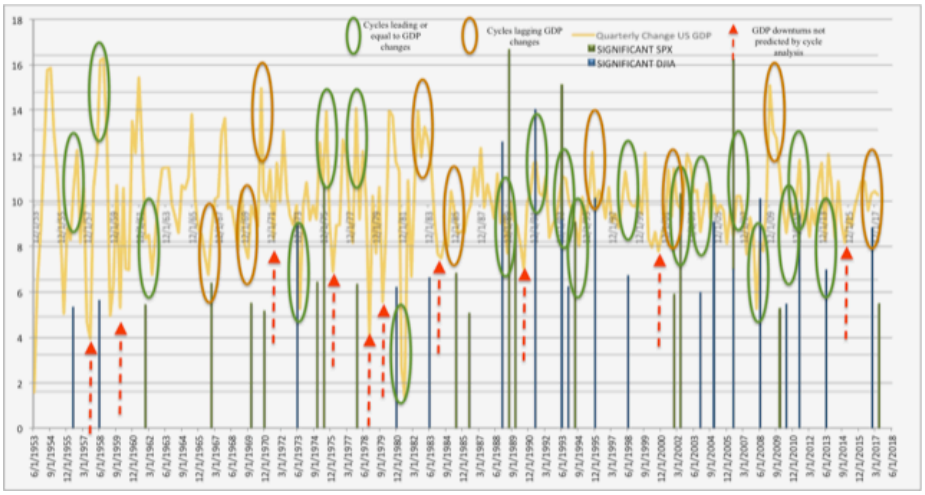

Figure 101: Annotated comparison of significant combined weighted DJIA and S&P 500 cycle counts with quarterly changes of U.S. GDP 1953-2017

In the final section of our analysis, we compare the output of our combined cycles across the DJIA and S&P 500 with the quarterly change in GDP of the U.S. Given that we found significant results for cycle interference across the DJIA and S&P 500 and that both indices are assumed to reflect the general performance of the economy, we expect to find significant results for our analysis of the U.S. GDP. Indeed, according to the results shown in Figure 101, the large majority of dates predicted through the interference of the most influential cycles in the DJIA and S&P 500 align with major turning points in the American economy over the period of study. Whilst the signals from cycles may slightly proceed or succeed actual GDP turning points, we find that over the 64 years studied, only 10 quarterly negative growth in the American GDP were not detected by cycles. These results are incredibly significant as they provide statistical proof of the prevalence of cycles within the economic performance of the U.S. despite the fiscal and monetary actions taken by the Federal Reserve Bank and the government to avoid boom and bust cycles. Further, our results demonstrate that the major fluctuations in U.S. economic performance can be forecasted by aggregating the predictions from cycle counts derived from the stock market indices. Even though cycle analysis doesn't estimate the occurrence of every turning point in the U.S. GDP, it still illustrates a fundamental pattern within the growth of the American economy that is based on one of the most futile yet complex dimensions of life, time.

V. Conclusion:

Throughout this paper, we have looked to challenge the misconceptions of cycles and prove their ability to predict major turning points in an economy. Based on the output of a series of spectral analyses, we were able to determine underlying cycles in the DJIA and S&P 500 and test the predictions of cycle analysis against the actual pivot points of both indices and the changes in U.S. economic activity. Our results illustrated the accuracy to which major turning points can be estimated by cycles. To test the application of these findings to the field of finance, we calculated the return of an investment strategy based on cycle analysis and compared it to the returns delivered by random and risk-free strategies. We found that cycle analysis driven strategies provided the basis of a significant profitable investment strategy which could be further optimized when used in conjunction with technical analysis and a sufficient capital trading allowance. Additionally, we looked at the phenomenon of interference as a mechanism to extend the accuracy of cycle analysis in predicting important economic and market movements. The results show that by combining and aggregating the cycle predictions of the Dow Jones Industrial Average and Standard & Poor's 500 indices, we are able to forecast pivot points in the growth of U.S. GDP and establish the existence of time cycles in the American economy.

To conclude, cycle analysis has proven to be a highly pertinent field of study as it extends our understanding of economic phenomena beyond the scope of classical economic theory and invites one to question the impact of government interventions in the boom and bust cycles as our results suggest growth and decline are interwoven in time.

VI. Limitations and further research:

Our analysis was limited to the data retrievable from Bloomberg but non-digital archives possess a wide range of historical data. The study of cycle analysis performed in this paper could be improved by studying data that covers more extensive timeframe. However, those alternative data sources need to be validated for completeness and accuracy. Our methodology considered each time-period as a complete dataset as the basis of spectral analysis. Further research should break that dataset down into subsets which would be then tested for accuracy to determine whether cycles are consistent over time, or whether they diminish in importance, and whether the subsets' results predict future subsets' price actions. Our results indicated that there are sometimes lags between high cycle counts and changes in economic activity, further research should concentrate on defining those lags to fine tune the

accuracy of predictive results. Finally, we used U.S. GDP data as our barometer of the U.S. economy but governments tend to counter the private economy with deficits and stimulus packages. Therefore, to further assert the predictive power of cycles, further research should extend the analysis conducted in this paper to other aspects of the economy, including jobs, unemployment, housing and credit and to other countries.

Appendix:

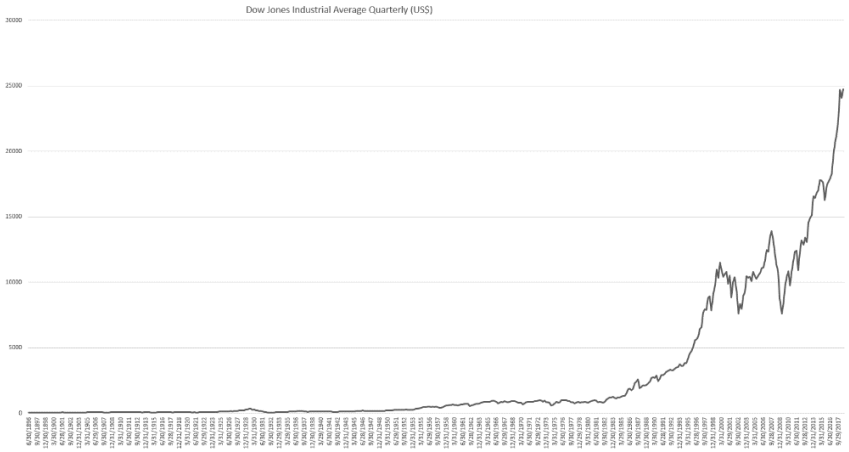

Figure 1: Dow Jones Industrial Average Quarterly (US $)

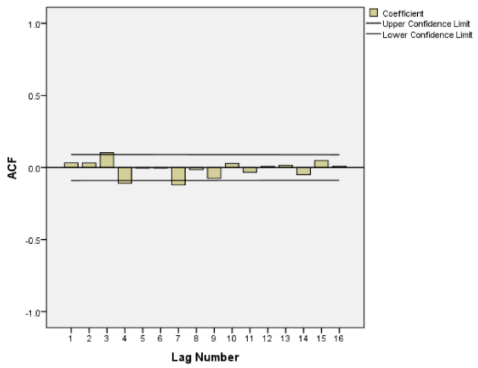

Figure 3: Autocorrelation function of the 1logDJIA

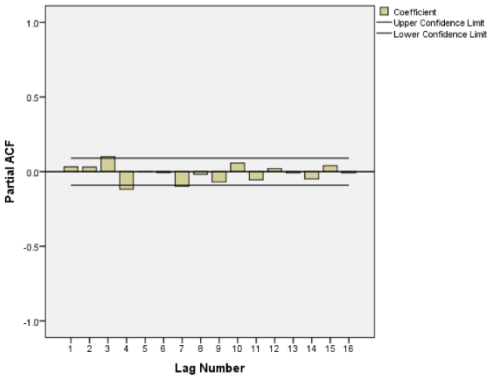

Figure 4: Partial autocorrelation function of the 1logDJIA

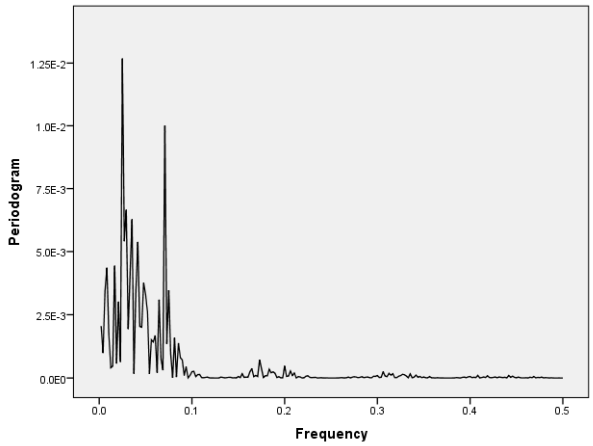

Figure 5: Spectral Analysis of Dow Jones Industrial Average Quarterly Data

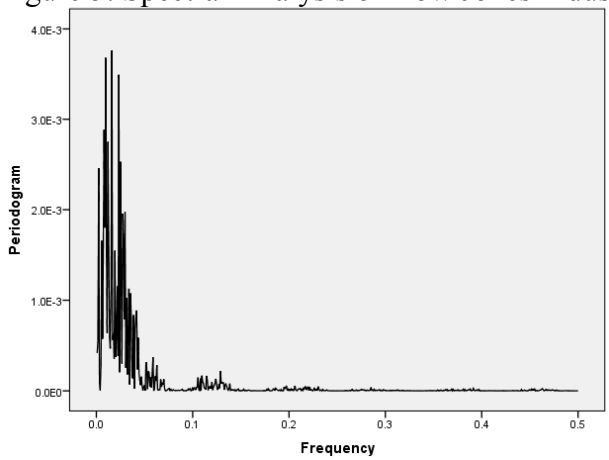

Figure 6: Spectral Analysis of Dow Jones Industrial Average Monthly Data

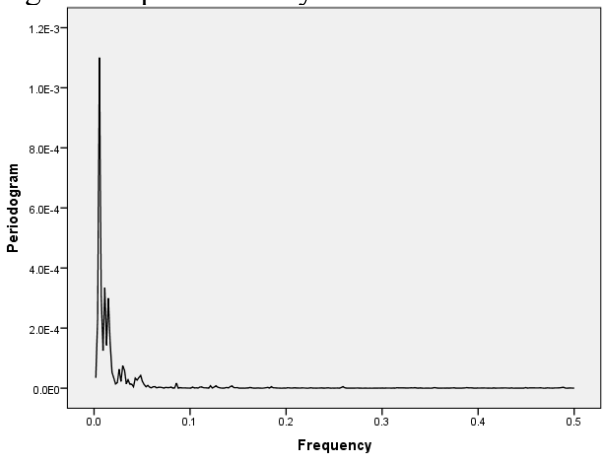

Figure 7: Spectral Analysis of Dow Jones Industrial Average Weekly Data

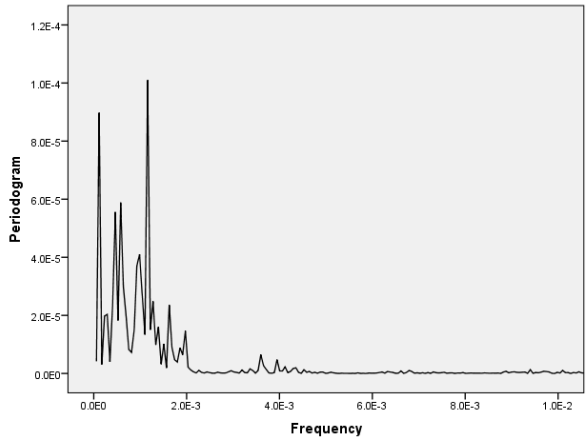

Figure 8: Spectral Analysis of Standard & Poor's 500 Quarterly Data

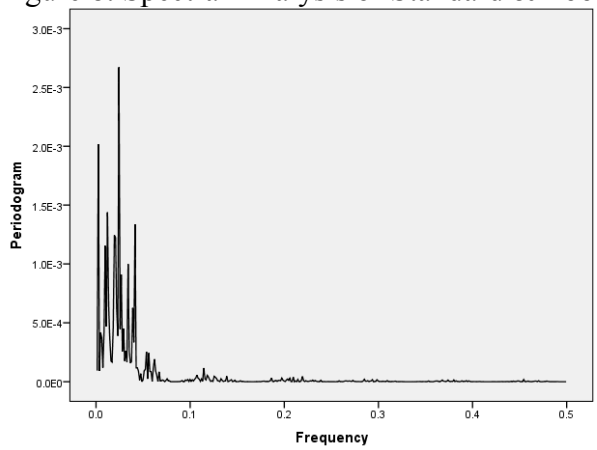

Figure 9: Spectral Analysis of Standard & Poor's 500 Monthly Data

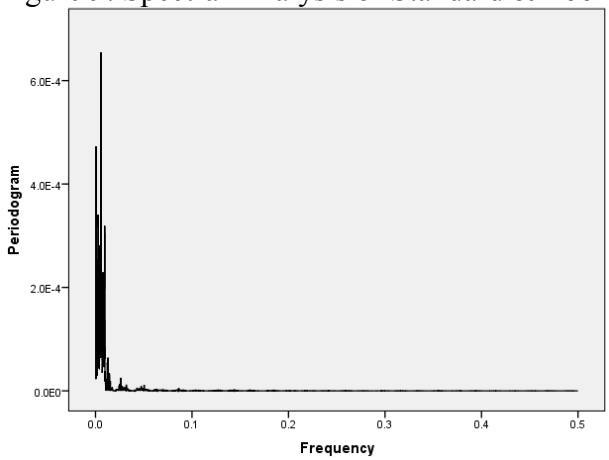

Figure 10: Spectral Analysis of Standard & Poor's 500 Weekly Data

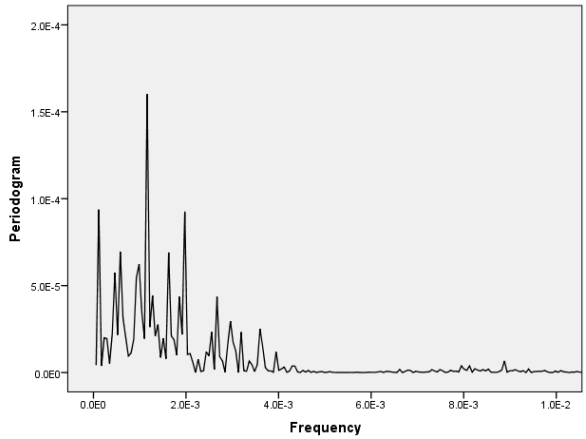

Figure 11: Spectral Analysis of Standard & Poor's 500 Daily Data

Table 1: Output of Dickey Fuller test for Dow Jones Industrial Average

Tau (Observed value)	-8.738
Tau (Critical Value)	-3.401
P-value	0.001
Alpha	0.05

Table 2: Output of Dickey Fuller test for Standard & Poor's 500

Tau (Observed Value)	-6.924
Tau (Critical Value)	-3.401
P-value	0.001
Alpha	0.05

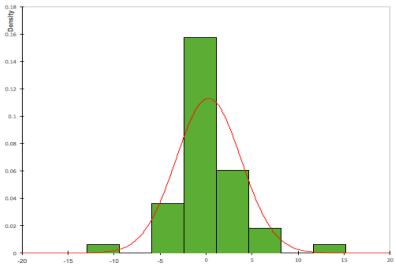

Figure 12: Distribution of the observed differences for the 295 quarter cycle - DJIA

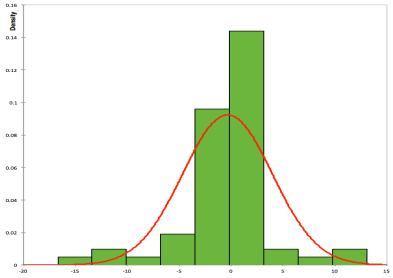

Figure 13: Distribution of the observed differences for the 112 quarter cycle - DJIA

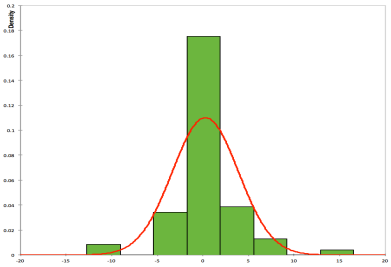

Figure 14: Distribution of the observed differences for the 81 quarter cycle - DJIA

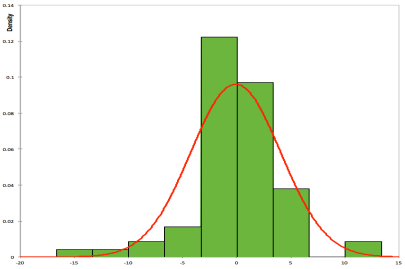

Figure 15: Distribution of the observed differences for the 47 quarter cycle - DJIA

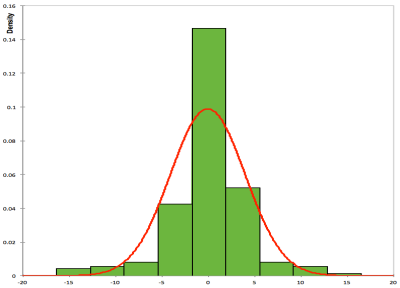

Figure 16: Distribution of the observed differences for the 41 quarter cycle – DJIA

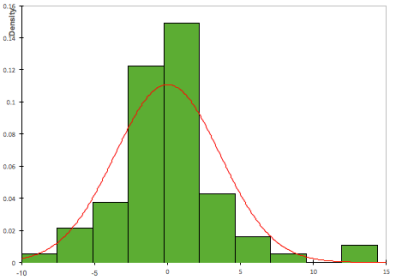

Figure 17: Distribution of the observed differences for the 31 quarter cycle - DJIA

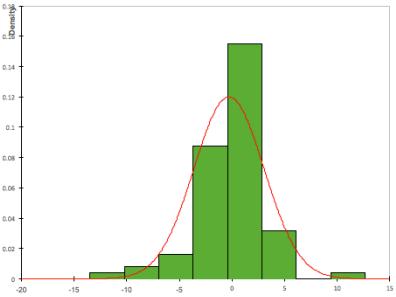

Figure 18: Distribution of the observed differences for the 20 quarter cycle - DJIA

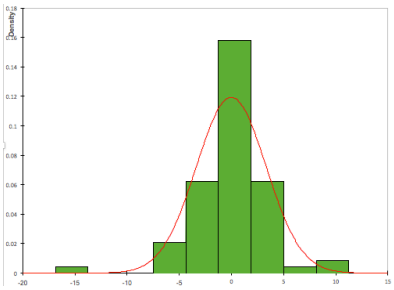

Figure 19: Distribution of the observed differences for the 16 quarter cycle - DJIA

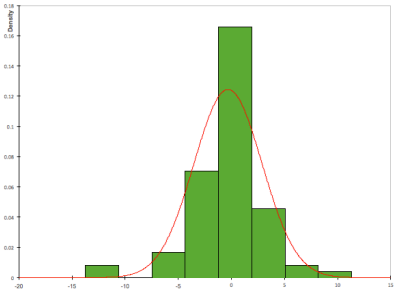

Figure 20: Distribution of the observed differences for the 14 quarter cycle - DJIA

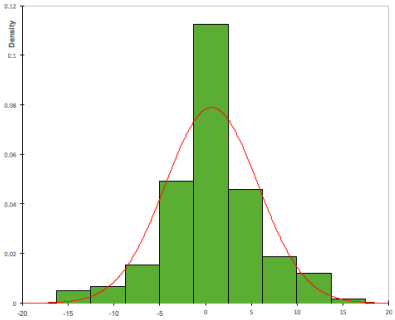

Figure 21: Distribution of the observed differences for the 463 month cycle – DJIA

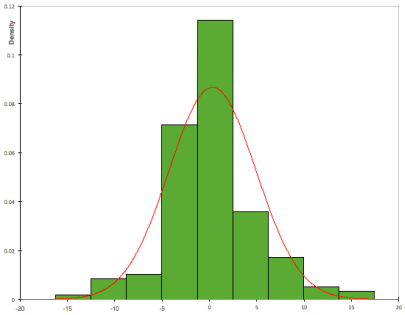

Figure 22: Distribution of the observed differences for the 177 month cycle – DJIA

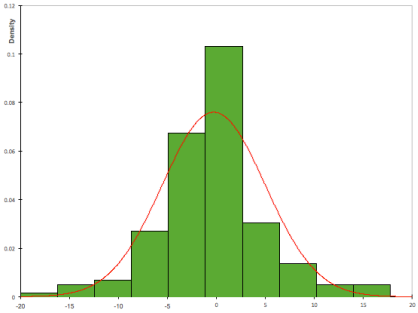

Figure 23: Distribution of the observed differences for the 127 month cycle – DJIA

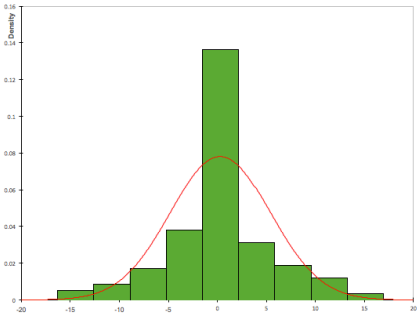

Figure 24: Distribution of the observed differences for the 105 month cycle – DJIA

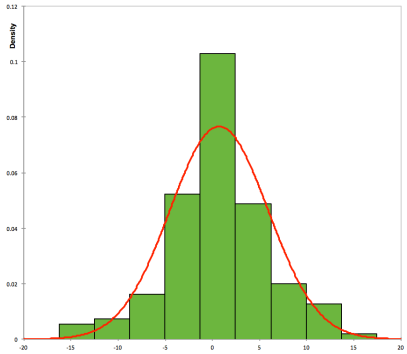

Figure 25: Distribution of the observed differences for the 83 month cycle - DJIA

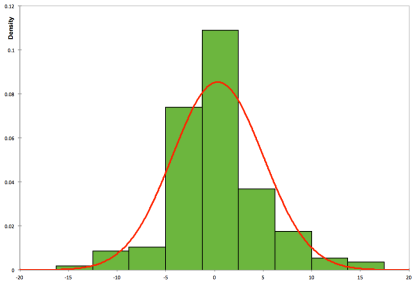

Figure 26: Distribution of the observed differences for the 62 month cycle – DJIA

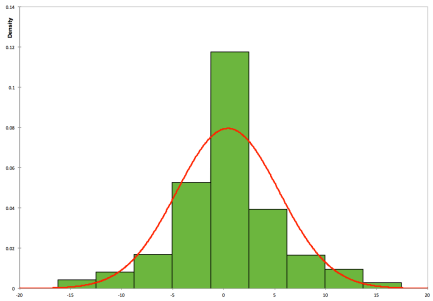

Figure 27: Distribution of the observed differences for the 40 month cycle - DJIA

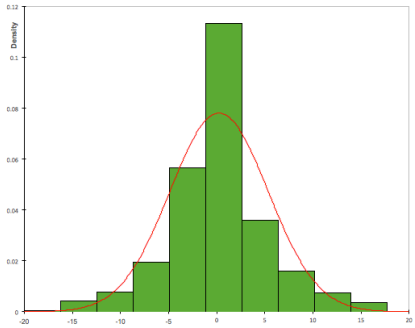

Figure 28: Distribution of the observed differences for the 34 month cycle - DJIA

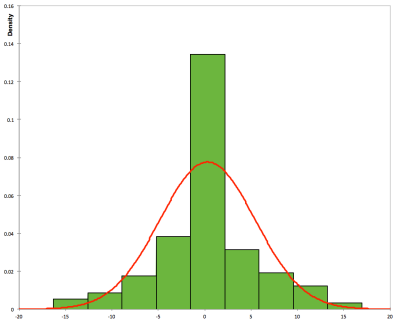

Figure 29: Distribution of the observed differences for the 24 month cycle - DJIA

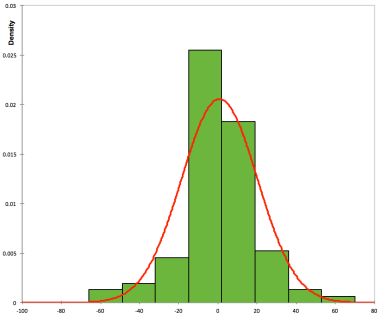

Figure 30: Distribution of the observed differences for the 348 week cycle - DJIA

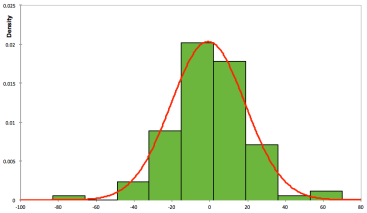

Figure 31: Distribution of the observed differences for the 174 week cycle - DJIA

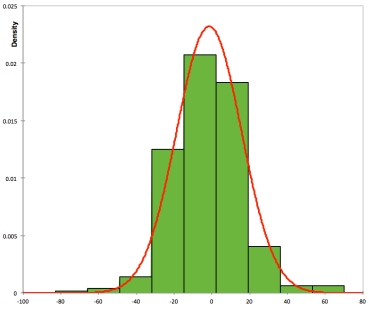

Figure 32: Distribution of the observed differences for the 131 week cycle – DJIA

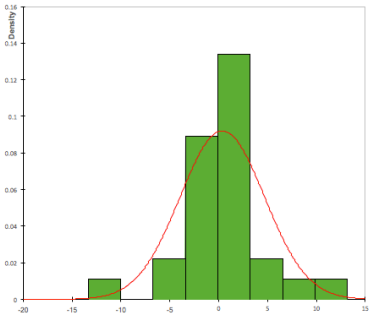

Figure 33: Distribution of the observed differences for the 109 week cycle – DJIA

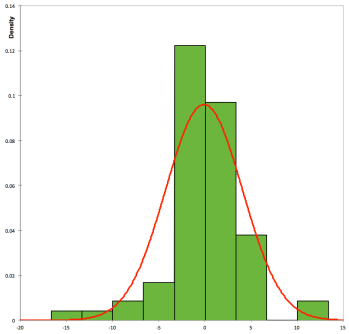

Figure 34: Distribution of the observed differences for the 65 week cycle – DJIA

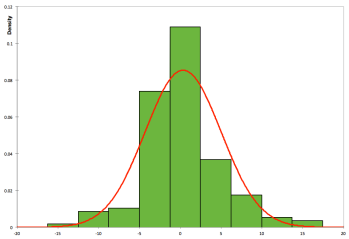

Figure 35: Distribution of the observed differences for the 38 week cycle - DJIA

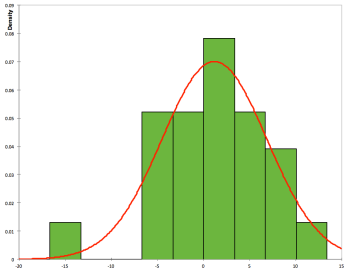

Figure 36: Distribution of the observed differences for the 125 quarter cycle - S&P500

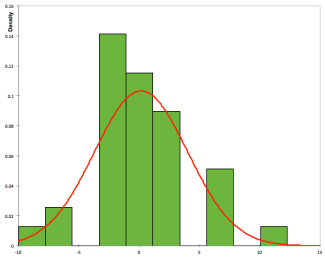

Figure 37: Distribution of the observed differences for the 27 quarter cycle - S&P500

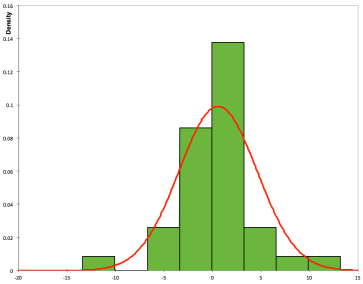

Figure 38: Distribution of the observed differences for the 16 quarter cycle - S&P500

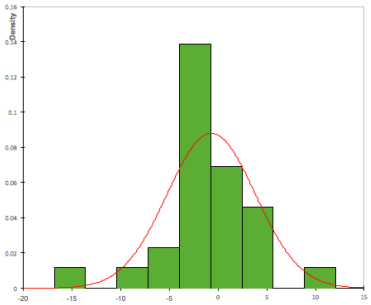
Figure 39: Distribution of the observed differences for the 14 quarter cycle - S&P500

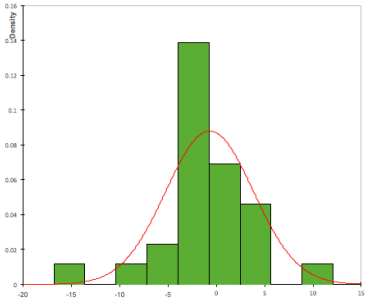
Figure 40: Distribution of the observed differences for the 14 quarter cycle - S&P500

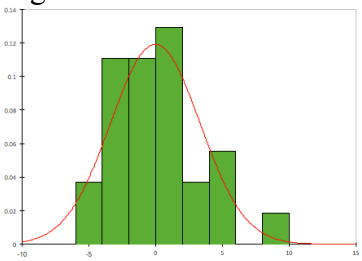
Figure 41: Distribution of the observed differences for the 29 quarter cycle - S&P500

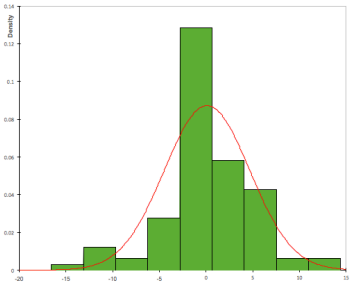
Figure 42: Distribution of the observed differences for the 85 month cycle - S&P500

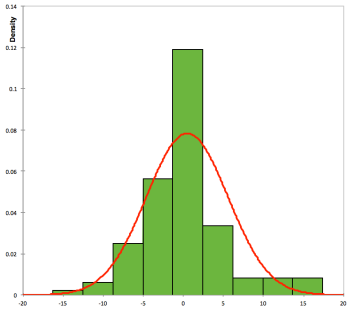
Figure 43: Distribution of the observed differences for the 53 month cycle - S&P500

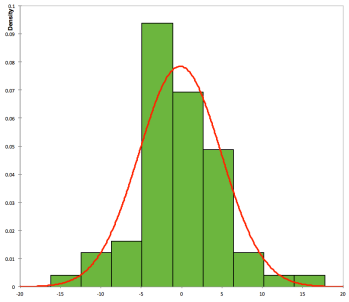
Figure 44: Distribution of the observed differences for the 43 month cycle - S&P500

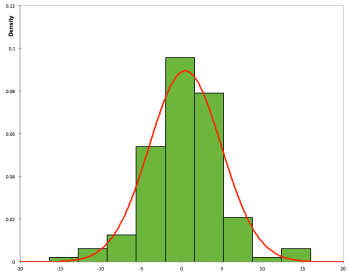
Figure 45: Distribution of the observed differences for the 24 month cycle - S&P500

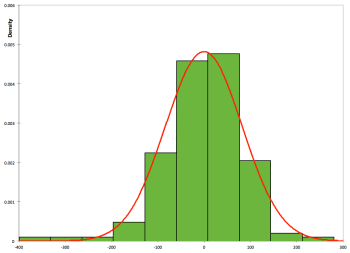
Figure 46: Distribution of the observed differences for the 5 month cycle - S&P500

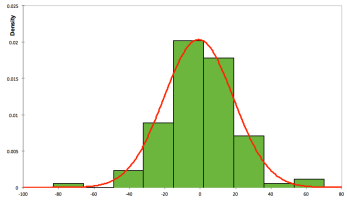
Figure 47: Distribution of the observed differences for the 4 month cycle - S&P500

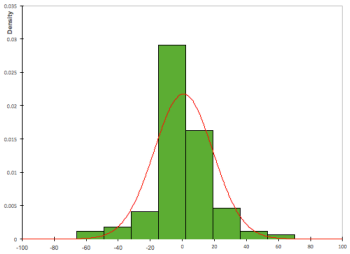
Figure 48: Distribution of the observed differences for the 385 week cycle - S&P500

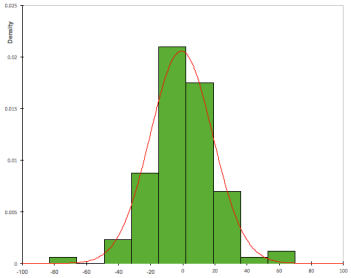
Figure 49: Distribution of the observed differences for the 176 week cycle - S&P500

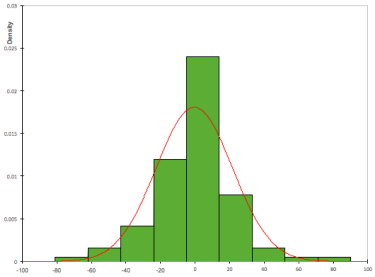
Figure 50: Distribution of the observed differences for the 102 week cycle - S&P500

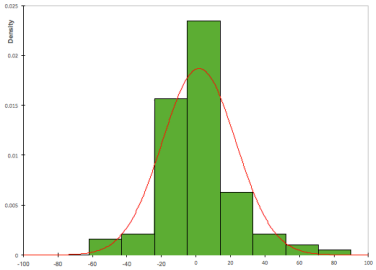
Figure 51: Distribution of the observed differences for the 215 week cycle - S&P500

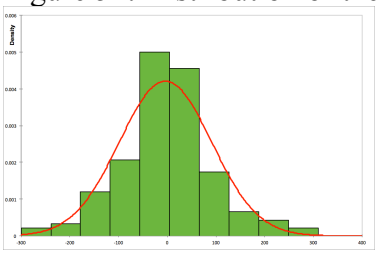
Figure 52: Distribution of the observed differences for the 862 day cycle - S&P500

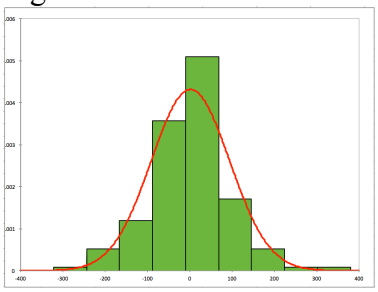
Figure 53: Distribution of the observed differences for the 632 day cycle - S&P500

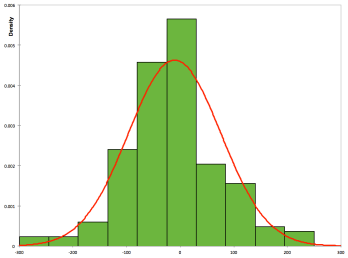
Figure 54: Distribution of the observed differences for the 510 day cycle - S&P500

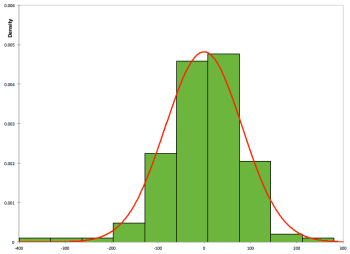

Figure 55: Distribution of the observed differences for the 376 day cycle - S&P500

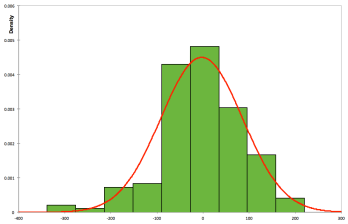

Figure 56: Distribution of the observed differences for the 313 day cycle - S&P500

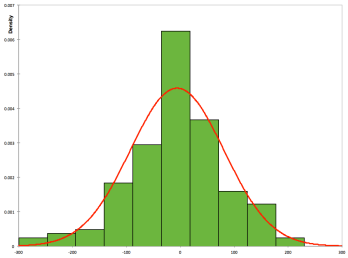

Figure 57: Distribution of the observed differences for the 278 day cycle - S&P500

Table 18: Summary of expected turning points, closest match and difference for DJIA Quarters (Set 1) 1900-1959

	EXPECTED TURNING POINTS				DIFFERENCES IN QUARTERS				CLOSEST MATCH			
Spectral Result	*0.0033919*	*0.0089337*	*0.0124229*	*0.021454*								
No. Q's	*294.81926*	*111.93592*	*80.496187*	*46.611377*	*294.8193*	*111.9359*	*80.4962*	*46.6114*	*294.81926*	*111.93592*	*80.496187*	*46.611377*
6/28/1901	3/12/1975	6/22/1929	8/12/1921	2/21/1913	-1.7926	1.0935	-0.4743	1.4105	9/30/1974	9/30/1929	6/30/1921	6/30/1913
9/30/1903	6/13/1977	9/24/1931	11/14/1923	5/26/1915	-1.8035	3.0648	-0.5181	-1.6011	12/31/1976	6/30/1932	9/28/1923	12/31/1914
3/30/1906	12/12/1979	3/24/1934	5/14/1926	11/23/1917	-0.8288	2.0572	-10.5058	0.4139	9/28/1979	9/28/1934	9/28/1923	12/31/1917
12/31/1907	9/13/1981	12/25/1935	2/14/1928	8/26/1919	-1.8254	-4.9626	6.5018	0.3811	3/31/1981	9/28/1934	9/30/1929	9/30/1919
9/30/1909	6/14/1983	9/24/1937	11/14/1929	5/26/1921	2.1718	-1.9400	-0.4962	0.3811	12/30/1983	3/31/1937	9/30/1929	6/30/1921
9/30/1910	6/13/1984	9/24/1938	11/14/1930	5/26/1922	0.1677	1.0607	-4.4934	3.3708	6/29/1984	12/30/1938	9/30/1929	3/30/1923
9/29/1911	6/12/1985	9/23/1939	11/13/1931	5/25/1923	-3.8186	-0.9325	2.5154	-0.6155	6/29/1984	6/30/1939	6/30/1932	3/30/1923
9/30/1912	6/14/1986	9/24/1940	11/14/1932	5/26/1924	5.1725	-0.9654	-1.5037	-2.6415	9/30/1987	6/28/1940	6/30/1932	9/28/1923
6/30/1913	3/14/1987	6/24/1941	8/14/1933	2/23/1925	2.1828	3.0648	4.4867	-5.6312	9/30/1987	3/31/1942	9/28/1934	9/28/1923
3/31/1914	12/13/1987	3/25/1942	5/15/1934	11/24/1925	0.1896	0.0641	1.4860	-8.6319	12/31/1987	3/31/1942	9/28/1934	9/28/1923
12/31/1914	9/13/1988	12/25/1942	2/14/1935	8/26/1926	-2.8220	2.0463	-1.5256	-11.6435	12/31/1987	6/30/1943	9/28/1934	9/28/1923
6/30/1916	3/14/1990	6/24/1944	8/14/1936	2/24/1928	2.1609	-1.9291	2.5045	6.3934	9/28/1990	12/31/1943	3/31/1937	9/30/1929
9/29/1916	6/13/1990	9/23/1944	11/13/1936	5/25/1928	1.1643	-2.9257	1.5079	5.3968	9/28/1990	12/31/1943	3/31/1937	9/30/1929
12/31/1917	9/14/1991	12/25/1945	2/14/1938	8/26/1929	-3.8514	2.0244	0.4894	0.3811	9/28/1990	6/28/1946	3/31/1938	9/30/1929
9/30/1919	6/13/1993	9/24/1947	11/14/1939	5/26/1931	-10.8384	2.0682	-1.5037	4.3893	9/28/1990	3/31/1948	6/30/1939	6/30/1932
6/30/1921	3/14/1995	6/24/1949	8/14/1941	2/23/1933	14.1855	0.0641	2.5045	-2.6086	9/30/1998	6/30/1949	3/31/1942	6/30/1932
3/30/1923	12/11/1996	3/24/1951	5/14/1943	11/23/1934	7.1985	-6.9229	0.5113	-0.6155	9/30/1998	6/30/1949	6/30/1943	9/28/1934
9/28/1923	6/11/1997	9/22/1951	11/12/1943	5/24/1935	5.2054	5.1017	0.5332	-2.6086	9/30/1998	12/31/1952	12/31/1943	9/28/1934
9/30/1929	6/14/2003	9/24/1957	11/14/1949	5/26/1941	2.1828	-0.9654	-1.5037	3.3818	12/31/2003	6/28/1957	6/30/1949	3/31/1942
6/30/1932	3/14/2006	6/24/1960	8/14/1952	2/24/1944	-4.8042	1.0716	1.5189	-0.6045	12/31/2004	9/30/1960	12/31/1952	12/31/1943
9/28/1934	6/11/2008	9/22/1962	11/12/1954	5/24/1946	-2.8220	-0.9325	-4.4715	0.3811	9/28/2007	6/29/1962	9/30/1953	6/28/1946
3/31/1937	12/13/2010	3/25/1965	5/15/1957	11/24/1948	3.1794	1.0607	0.4785	-1.6121	9/30/2011	6/30/1965	6/28/1957	6/30/1948
3/31/1938	12/13/2011	3/25/1966	5/15/1958	11/24/1949	-0.8179	-0.9215	-1.4818	-1.6121	9/30/2011	12/31/1965	12/31/1957	6/30/1949
12/30/1938	9/12/2012	12/24/1966	2/13/1959	8/25/1950	-3.8186	-0.9325	3.5120	-4.6127	9/30/2011	9/30/1966	12/31/1959	6/30/1949
6/30/1939	3/13/2013	6/24/1967	8/14/1959	2/23/1951	-5.8117	1.0607	1.5189	-6.6059	9/30/2011	9/29/1967	12/31/1959	6/30/1949
6/28/1940	3/12/2014	6/22/1968	8/12/1960	2/22/1952	3.2122	-0.9325	0.5332	3.4256	12/31/2014	3/29/1968	9/30/1960	12/31/1952
3/31/1942	12/13/2015	3/25/1970	5/15/1962	11/24/1953	-0.8179	1.0607	0.4894	-0.6045	9/30/2015	6/30/1970	6/29/1962	9/30/1953
6/30/1943	3/13/2017	6/24/1971	8/14/1963	2/23/1955	4.7892	-0.9325	-4.5044	4.3893	5/25/2018	3/31/1971	6/29/1962	3/30/1956
12/31/1943	9/13/2017	12/25/1971	2/14/1964	8/26/1955	2.7742	-2.9476	5.4942	2.3742	5/25/2018	3/31/1971	6/30/1965	3/30/1956
6/28/1946		6/22/1974	8/12/1966	2/21/1958		1.0935	0.5332	-0.5717		9/30/1974	9/30/1966	12/31/1957
9/30/1946		9/24/1974	11/14/1966	5/26/1958		0.0641	-0.4962	-1.6011		9/30/1974	9/30/1966	12/31/1957
3/31/1948		3/25/1976	5/15/1968	11/25/1959		3.0757	-0.5181	0.3920		12/31/1976	3/29/1968	12/31/1959
6/30/1948		6/24/1976	8/14/1968	2/24/1960		2.0791	-1.5147	-0.6045		12/31/1976	3/29/1968	12/31/1959
6/30/1949		6/24/1977	8/14/1969	2/23/1961		-1.9181	-2.4784	-1.6011		12/31/1976	12/31/1968	9/30/1960
12/31/1952		12/25/1980	2/14/1973	8/26/1964		1.0497	-0.5181	3.3708		3/31/1981	12/29/1972	6/30/1965
9/30/1953		9/24/1981	11/14/1973	5/26/1965		-1.9400	3.5011	0.3811		3/31/1981	9/30/1974	6/30/1965
3/30/1956		3/24/1984	5/14/1976	11/24/1967		-0.9325	2.5264	-0.6155		12/30/1983	12/31/1976	9/29/1967
6/28/1957		6/22/1985	8/12/1977	2/21/1969		-3.9222	-2.4565	-0.5717		6/29/1984	12/31/1976	12/31/1968
12/31/1957		12/25/1985	2/14/1978	8/26/1969		-5.9592	0.4894	-2.6086		6/29/1984	3/31/1978	12/31/1968
12/31/1959		12/25/1987	2/14/1980	8/26/1971		0.0641	0.5004	-1.6230		12/31/1987	3/31/1980	3/31/1971

Table 5: Summary of expected turning points, closest match and difference for DJIA Quarters (Set 1) 1960-2018

	EXPECTED TURNING POINTS				DIFFERENCES IN QUARTERS				CLOSEST MATCH			
Spectral Result	*0.0033919*	*0.0089337*	*0.0124229*	*0.021454*								
No. Q's	*294.81926*	*111.93592*	*80.496187*	*46.611377*	*294.8193*	*111.9359*	*80.4962*	*46.6114*	*294.81926*	*111.93592*	*80.496187*	*46.611377*
9/30/1960		9/24/1988	11/14/1980	5/26/1972		-2.9366	1.4970	2.3742		12/31/1987	3/31/1981	12/29/1972
12/29/1961		12/23/1989	2/12/1982	8/24/1973		3.0538	1.5079	-2.6086		9/28/1990	6/30/1982	12/29/1972
6/29/1962		6/23/1990	8/13/1982	2/22/1974		1.0607	-0.4852	2.4071		9/28/1990	6/30/1982	9/30/1974
6/30/1965		6/24/1993	8/14/1985	2/23/1977		-10.9530	-4.5044	-0.5936		9/28/1990	6/29/1984	12/31/1976
12/31/1965		12/25/1993	2/14/1986	8/26/1977		-12.9681	6.4908	2.3742		9/28/1990	9/30/1987	3/31/1978
9/30/1966		9/24/1994	11/14/1986	5/26/1978		-15.9578	3.5011	-0.6155		9/28/1990	9/30/1987	3/31/1978
9/29/1967		9/23/1995	11/13/1987	5/25/1979		12.0778	-0.4852	1.3777		9/30/1998	9/30/1987	9/28/1979
3/29/1968		3/23/1996	5/13/1988	11/23/1979		10.0846	-1.4709	-0.6155		9/30/1998	12/31/1987	9/28/1979
12/31/1968		12/25/1996	2/14/1989	8/26/1980		7.0511	-4.5044	-1.6230		9/30/1998	12/31/1987	3/31/1980
6/30/1970		6/24/1998	8/14/1990	2/23/1982		1.0716	0.4894	1.3886		9/30/1998	9/28/1990	6/30/1982
3/31/1971		3/25/1999	5/15/1991	11/24/1982		-1.9291	-2.5112	-1.6121		9/30/1998	9/28/1990	6/30/1982
12/29/1972		12/23/2000	2/12/1993	8/24/1984		3.0538	-9.5092	-0.6155		9/28/2001	9/28/1990	6/29/1984
9/30/1974		9/24/2002	11/14/1994	5/26/1986		0.0641	15.5038	5.3859		9/30/2002	9/30/1998	9/30/1987
12/31/1976		12/25/2004	2/14/1997	8/26/1988		0.0641	6.4908	-2.6196		12/31/2004	9/30/1998	12/31/1987
3/31/1978		3/25/2006	5/15/1998	11/24/1989		-4.9188	1.5079	3.3708		12/31/2004	9/30/1998	9/28/1990
9/29/1978		9/23/2006	11/13/1998	5/25/1990		4.0504	-0.4852	1.3777		9/28/2007	9/30/1998	9/28/1990
9/28/1979		9/22/2007	11/12/1999	5/24/1991		0.0641	0.5332	-2.6086		9/28/2007	12/31/1999	9/28/1990
3/31/1980		3/25/2008	5/15/2000	11/25/1991		-1.9619	-1.4928	-4.6346		9/28/2007	12/31/1999	9/28/1990
3/31/1981		3/25/2009	5/15/2001	11/24/1992		0.0641	1.4860	-8.6319		3/31/2009	9/28/2001	9/28/1990
6/30/1982		6/24/2010	8/14/2002	2/23/1994		-4.9298	0.5113	-13.6258		3/31/2009	9/30/2002	9/28/1990
12/30/1983		12/24/2011	2/13/2004	8/25/1995		-0.9325	-0.4852	12.3948		9/30/2011	12/31/2003	9/30/1998
6/29/1984		6/23/2012	8/13/2004	2/23/1996		-2.9257	0.5223	10.4016		9/30/2011	9/30/2004	9/30/1998
9/30/1987		9/24/2015	11/14/2007	5/26/1999		0.0641	-0.5181	2.3962		9/30/2015	9/28/2007	12/31/1999
12/31/1987		12/25/2015	2/14/2008	8/26/1999		-0.9434	-1.5256	1.3886		9/30/2015	9/28/2007	12/31/1999
9/28/1990			11/12/2010	5/24/2002			3.5230	1.4105			9/30/2011	9/30/2002
9/30/1998				5/26/2010				-4.6127				3/31/2009
12/31/1999				8/26/2011				0.3811				9/30/2011
9/28/2001				5/24/2013				6.4153				12/31/2014
9/30/2002				5/26/2014				2.3962				12/31/2014
12/31/2003				8/26/2015				0.3811				9/30/2015
9/30/2004				5/26/2016				-2.6196				9/30/2015
12/31/2004				8/26/2016				-3.6271				9/30/2015
9/28/2007												
3/31/2009												
9/30/2011												
12/31/2014												
9/30/2015												
5/25/2018												

Table 6: Summary of expected turning points, closest match and difference for DJIA Quarters (Set 2) 1900-1959

	EXPECTED TURNING POINTS					DIFFERENCES IN QUARTERS					CLOSEST MATCH				
Spectral Result	*0.0244354*	*0.0326454*	*0.0490655*	*0.0634331*	*0.0728746*										
No. Q's	*40.924238*	*30.632156*	*20.380917*	*15.764648*	*13.722199*	*40.9242*	*30.6322*	*20.3809*	*15.7646*	*13.7222*	*40.924238*	*30.632156*	*20.380917*	*15.764648*	*13.722199*
6/28/1901	9/20/1911	2/23/1909	8/2/1906	6/6/1905	12/2/1904	0.0888	2.3973	-1.3693	3.2470	-4.6982	9/29/1911	9/30/1909	3/30/1906	3/30/1906	9/30/1903
9/30/1903	12/22/1913	5/28/1911	11/3/1908	9/8/1907	3/6/1907	1.0744	1.3569	-3.3734	1.2429	3.2853	3/31/1914	9/29/1911	12/31/1907	12/31/1907	12/31/1907
3/30/1906	6/21/1916	11/25/1913	5/4/1911	3/8/1910	9/3/1909	0.0888	1.3788	1.6205	-1.7469	0.2956	6/30/1916	3/31/1914	9/29/1911	9/30/1909	9/30/1909
12/31/1907	3/24/1918	8/28/1915	2/3/1913	12/9/1911	6/6/1911	-0.9188	-2.6294	-1.3802	-0.7831	1.2593	12/31/1917	12/31/1914	9/30/1912	9/29/1911	9/29/1911
9/30/1909	12/23/1919	5/28/1917	11/4/1914	9/8/1913	3/6/1913	-0.9297	2.3754	0.6239	-0.7722	1.2703	9/30/1919	12/31/1917	12/31/1914	6/30/1913	6/30/1913
9/30/1910	12/22/1920	5/28/1918	11/4/1915	9/8/1914	3/6/1914	2.0710	-1.6219	2.6170	1.2429	0.2737	6/30/1921	12/31/1917	6/30/1916	12/31/1914	3/31/1914
9/29/1911	12/21/1921	5/27/1919	11/2/1916	9/7/1915	3/5/1915	-1.9153	1.3788	-0.3727	-2.7434	-0.7010	6/30/1921	9/30/1919	9/29/1916	12/31/1914	12/31/1914
9/30/1912	12/23/1922	5/28/1920	11/4/1917	9/8/1916	3/6/1916	1.0525	-2.6404	0.6239	0.2244	1.2703	3/30/1923	9/30/1919	12/31/1917	9/29/1916	6/30/1916
6/30/1913	9/22/1923	2/25/1921	8/4/1918	6/8/1917	12/4/1916	0.0559	1.3678	-2.3659	2.2504	-0.7229	9/28/1923	6/30/1921	12/31/1917	12/31/1917	9/29/1916
3/31/1914	6/22/1924	11/26/1921	5/5/1919	3/9/1918	9/4/1917	-2.9448	-1.6328	1.6205	-0.7503	1.2922	9/28/1923	6/30/1921	9/30/1919	12/31/1917	12/31/1917
12/31/1914	3/24/1925	8/28/1922	2/4/1920	12/9/1918	6/6/1918	-5.9564	2.3425	-1.3912	3.2251	-1.7195	9/28/1923	3/30/1923	9/30/1919	9/30/1919	12/31/1917
6/30/1916	9/22/1926	2/26/1924	8/4/1921	6/8/1920	12/5/1919	-11.9468	-1.6547	-0.3837	-2.7653	-0.7229	9/28/1923	9/28/1923	6/30/1921	9/30/1919	9/30/1919
9/29/1916	12/22/1926	5/27/1924	11/3/1921	9/7/1920	3/5/1920	11.0840	-2.6513	-1.3802	3.2360	-1.7195	9/30/1929	9/28/1923	6/30/1921	6/30/1921	9/30/1919
12/31/1917	3/24/1928	8/28/1925	2/4/1923	12/9/1921	6/6/1921	6.0682	-7.6671	0.5910	-1.7797	0.2627	9/30/1929	9/28/1923	3/30/1923	6/30/1921	6/30/1921
9/30/1919	12/22/1929	5/28/1927	11/3/1924	9/8/1923	3/6/1923	-0.9188	9.3733	-4.4028	0.2134	0.2627	9/30/1929	9/30/1929	9/28/1923	9/28/1923	3/30/1923
6/30/1921	9/22/1931	2/25/1929	8/4/1926	6/8/1925	12/4/1924	3.0785	2.3754	-11.4008	-6.7845	-4.7420	6/30/1932	9/30/1929	9/28/1923	9/28/1923	9/28/1923
3/30/1923	6/21/1933	11/25/1930	5/3/1928	3/8/1927	9/3/1926	-3.9085	-4.6116	5.6396	10.2559	-11.7290	6/30/1932	9/30/1929	9/30/1929	9/30/1929	9/28/1923
9/28/1923	12/20/1933	5/26/1931	11/1/1928	9/6/1927	3/4/1927	3.0785	4.3904	3.6465	8.2627	10.3052	9/28/1934	6/30/1932	9/30/1929	9/30/1929	9/30/1929
9/30/1929	12/23/1939	5/28/1937	11/4/1934	9/8/1933	3/6/1933	-1.9372	-0.6363	-0.4056	4.2107	-2.7270	6/30/1939	3/31/1937	9/28/1934	9/28/1934	6/30/1932
6/30/1932	9/22/1942	2/26/1940	8/4/1937	6/8/1936	12/5/1935	-1.9263	1.3459	-1.3802	3.2360	-4.7420	3/31/1942	6/28/1940	3/31/1937	3/31/1937	9/28/1934
9/28/1934	12/20/1944	5/26/1942	11/2/1939	9/6/1938	3/4/1938	-3.8975	-0.6144	-1.3693	1.2538	0.2956	12/31/1943	3/31/1942	6/30/1939	12/30/1938	3/31/1938
3/31/1937	6/23/1947	11/26/1944	5/5/1942	3/9/1941	9/4/1940	-2.9229	-3.6260	-0.3837	-2.7872	-0.7448	9/30/1946	12/31/1943	3/31/1942	6/28/1940	6/28/1940
3/31/1938	6/22/1948	11/26/1945	5/5/1943	3/9/1942	9/4/1941	0.0778	2.3425	0.6129	0.2354	2.2778	6/30/1948	6/28/1946	6/30/1943	3/31/1942	3/31/1942
12/30/1938	3/23/1949	8/27/1946	2/3/1944	12/8/1942	6/5/1942	1.0744	0.3713	-0.3727	2.2285	-0.7229	6/30/1949	9/30/1946	12/31/1943	6/30/1943	3/31/1942
6/30/1939	9/21/1949	2/25/1947	8/3/1944	6/8/1943	12/4/1942	-0.9188	-1.6219	-2.3659	0.2354	2.2778	6/30/1949	9/30/1946	12/31/1943	6/30/1943	6/30/1943
6/28/1940	9/20/1950	2/24/1948	8/2/1945	6/6/1944	12/3/1943	-4.9051	0.3932	3.6136	-1.7359	0.3065	6/30/1949	3/31/1948	6/28/1946	12/31/1943	12/31/1943
3/31/1942	6/22/1952	11/26/1949	5/5/1947	3/9/1946	9/4/1945	2.0929	-1.6328	-2.3768	1.2100	3.2525	12/31/1952	6/30/1949	9/30/1946	6/28/1946	6/28/1946
6/30/1943	9/21/1953	2/25/1951	8/3/1948	6/8/1947	12/4/1946	0.0888	-6.6267	-0.3727	-2.7544	-0.7119	9/30/1953	6/30/1949	6/30/1948	9/30/1946	9/30/1946
12/31/1943	3/24/1954	8/28/1951	2/3/1949	12/9/1947	6/6/1947	-1.9263	5.3761	1.6095	1.2319	-2.7270	9/30/1953	12/31/1952	6/30/1949	3/31/1948	9/30/1946
6/28/1946	9/19/1956	2/23/1954	8/2/1951	6/6/1950	12/2/1949	-1.9044	-1.6000	5.6615	-3.7400	-1.6976	3/30/1956	9/30/1953	12/31/1952	6/30/1949	6/30/1949
9/30/1946	12/22/1956	5/28/1954	11/4/1951	9/8/1950	3/6/1950	2.0491	-2.6294	4.6321	-4.7694	-2.7270	6/28/1957	9/30/1953	12/31/1952	6/30/1949	6/30/1949
3/31/1948	6/23/1958	11/27/1955	5/5/1953	3/9/1952	9/5/1951	-1.9153	1.3569	-1.3693	3.2470	5.2894	12/31/1957	3/30/1956	12/31/1952	12/31/1952	12/31/1952
6/30/1948	9/22/1958	2/26/1956	8/4/1953	6/8/1952	12/5/1951	-2.9119	0.3603	0.6239	2.2504	4.2929	12/31/1957	3/30/1956	9/30/1953	12/31/1952	12/31/1952
6/30/1949	9/22/1959	2/25/1957	8/4/1954	6/8/1953	12/4/1952	1.0853	1.3459	-3.3734	1.2429	0.2956	12/31/1959	6/28/1957	9/30/1953	9/30/1953	12/31/1952
12/31/1952	3/25/1963	8/28/1960	2/4/1958	12/9/1956	6/6/1956	-2.9557	0.3603	-0.3837	2.1957	-0.7448	6/29/1962	9/30/1960	12/31/1957	6/28/1957	3/30/1956
9/30/1953	12/23/1963	5/28/1961	11/4/1958	9/8/1957	3/6/1957	-5.9455	2.3535	-3.3734	-0.7941	1.2484	6/29/1962	12/29/1961	12/31/1957	6/28/1957	6/28/1957
3/30/1956	6/22/1966	11/26/1963	5/4/1961	3/8/1960	9/4/1959	1.0853	-5.6411	-2.3659	-0.7503	1.2922	9/30/1966	6/29/1962	9/30/1960	12/31/1959	12/31/1959
6/28/1957	9/20/1967	2/23/1965	8/2/1962	6/6/1961	12/2/1960	0.0888	1.3897	-0.3727	2.2504	-0.6900	9/29/1967	6/30/1965	6/29/1962	12/29/1961	9/30/1960
12/31/1957	3/24/1968	8/28/1965	2/4/1963	12/9/1961	6/6/1961	0.0450	-0.6472	-2.4097	0.2134	2.2559	3/29/1968	6/30/1965	6/29/1962	12/29/1961	12/29/1961
12/31/1959	3/24/1970	8/28/1967	2/3/1965	12/9/1963	6/6/1963	1.0634	0.3494	1.6095	-5.7879	-3.7455	6/30/1970	9/29/1967	6/30/1965	6/29/1962	6/29/1962

Table 7: Summary of expected turning points, closest match and difference for DJIA Quarters (Set 2) 1960-2018

EXPECTED TURNING POINTS						DIFFERENCES IN QUARTERS					CLOSEST MATCH				
Spectral Result	*0.0244354*	*0.0326454*	*0.0490655*	*0.0634331*	*0.0728746*										
No. Q's	*40.924238*	*30.632156*	*20.380917*	*15.764648*	*13.722199*	*40.9242*	*30.6322*	*20.3809*	*15.7646*	*13.7222*	*40.924238*	*30.632156*	*20.380917*	*15.764648*	*13.722199*
9/30/1960	12/23/1970	5/28/1968	11/4/1965	9/8/1964	3/6/1964	1.0634	-0.6582	0.6239	3.2251	5.2675	3/31/1971	3/29/1968	12/31/1965	6/30/1965	6/30/1965
12/29/1961	3/22/1972	8/26/1969	2/2/1967	12/7/1965	6/4/1965	3.0785	-2.6075	-1.3693	0.2573	0.2846	12/29/1972	12/31/1968	9/30/1966	12/31/1965	6/30/1965
6/29/1962	9/20/1972	2/24/1970	8/3/1967	6/7/1966	12/3/1965	1.0853	1.3788	0.6239	1.2538	0.3065	12/29/1972	6/30/1970	9/29/1967	9/30/1966	12/31/1965
6/30/1965	9/22/1975	2/25/1973	8/4/1970	6/8/1969	12/4/1968	-3.9194	-0.6363	-0.3837	-1.7469	0.2956	9/30/1974	12/29/1972	6/30/1970	12/31/1968	12/31/1968
12/31/1965	3/24/1976	8/28/1973	2/4/1971	12/9/1969	6/6/1969	3.0785	-2.6513	0.6020	2.2176	-1.7195	12/31/1976	12/29/1972	3/31/1971	6/30/1970	12/31/1968
9/30/1966	12/22/1976	5/28/1974	11/4/1971	9/8/1970	3/6/1970	0.0888	1.3678	-2.3878	-0.7722	1.2703	12/31/1976	9/30/1974	3/31/1971	6/30/1970	6/30/1970
9/29/1967	12/21/1977	5/27/1975	11/2/1972	9/7/1971	3/5/1971	1.0853	-2.6185	0.6239	-1.7578	0.2846	3/31/1978	9/30/1974	12/29/1972	3/31/1971	3/31/1971
3/29/1968	6/21/1978	11/25/1975	5/3/1973	3/7/1972	9/3/1971	-0.9078	4.4014	-1.3693	3.2470	-1.7085	3/31/1978	12/31/1976	12/29/1972	12/29/1972	3/31/1971
12/31/1968	3/25/1979	8/28/1976	2/4/1974	12/9/1972	6/6/1972	-1.9482	1.3678	2.6061	0.2134	2.2559	9/29/1978	12/31/1976	9/30/1974	12/29/1972	12/29/1972
6/30/1970	9/21/1980	2/25/1978	8/4/1975	6/8/1974	12/4/1973	-1.9153	0.3713	-3.3734	1.2429	3.2853	3/31/1980	3/31/1978	9/30/1974	9/30/1974	9/30/1974
3/31/1971	6/22/1981	11/26/1978	5/4/1976	3/9/1975	9/4/1974	-0.9188	-0.6363	2.6389	-1.7578	0.2846	3/31/1981	9/29/1978	12/31/1976	9/30/1974	9/30/1974
12/29/1972	3/23/1983	8/26/1980	2/2/1978	12/7/1976	6/4/1976	-2.9229	-1.6219	0.6239	0.2573	2.2997	6/30/1982	3/31/1980	3/31/1978	12/31/1976	12/31/1976
9/30/1974	12/22/1984	5/28/1982	11/4/1979	9/8/1978	3/6/1978	-1.9372	0.3603	-0.4056	0.2244	0.2737	6/29/1984	6/30/1982	9/28/1979	9/29/1978	3/31/1978
12/31/1976	3/25/1987	8/28/1984	2/4/1982	12/9/1980	6/6/1980	2.0600	-0.6582	1.5985	1.2210	-0.7338	9/30/1987	6/29/1984	6/30/1982	3/31/1981	3/31/1980
3/31/1978	6/22/1988	11/26/1985	5/5/1983	3/9/1982	9/4/1981	-1.9153	-5.6411	2.6170	1.2319	-1.7195	12/31/1987	6/29/1984	12/30/1983	6/30/1982	3/31/1981
9/29/1978	12/21/1988	5/27/1986	11/3/1983	9/7/1982	3/5/1982	-3.9085	5.3761	0.6239	-0.7612	1.2812	12/31/1987	9/30/1987	12/30/1983	6/30/1982	6/30/1982
9/28/1979	12/20/1989	5/26/1987	11/1/1984	9/6/1983	3/4/1983	3.0785	1.3897	-1.3693	1.2538	-2.7051	9/28/1990	9/30/1987	6/29/1984	12/30/1983	6/30/1982
3/31/1980	6/23/1990	11/27/1987	5/5/1985	3/9/1984	9/5/1983	1.0525	0.3713	-3.3953	-0.7722	1.2703	9/28/1990	12/31/1987	6/29/1984	12/30/1983	12/30/1983
3/31/1981	6/23/1991	11/26/1988	5/5/1986	3/9/1985	9/4/1984	-2.9448	-3.6260	5.6177	-2.7763	-0.7338	9/28/1990	12/31/1987	9/30/1987	6/29/1984	6/29/1984
6/30/1982	9/21/1992	2/25/1990	8/4/1987	6/8/1986	12/4/1985	-7.9386	2.3535	0.6239	5.2401	-5.7277	9/28/1990	9/28/1990	9/30/1987	9/30/1987	6/29/1984
12/30/1983	3/23/1994	8/27/1991	2/2/1989	12/8/1987	6/5/1987	-13.9400	-3.6479	-4.3700	0.2463	1.2812	9/28/1990	9/28/1990	12/31/1987	12/31/1987	9/30/1987
6/29/1984	9/21/1994	2/25/1992	8/3/1989	6/7/1988	12/4/1987	-15.9331	-5.6411	4.6102	-1.7469	0.2956	9/28/1990	9/28/1990	9/28/1990	12/31/1987	12/31/1987
9/30/1987	12/22/1997	5/28/1995	11/3/1992	9/8/1991	3/6/1991	3.0785	13.3706	-8.4001	-3.7838	-1.7414	9/30/1998	9/30/1998	9/28/1990	9/28/1990	9/28/1990
12/31/1987	3/24/1998	8/28/1995	2/3/1993	12/9/1991	6/6/1991	2.0710	12.3631	-9.4076	-4.7913	-2.7489	9/30/1998	9/30/1998	9/28/1990	9/28/1990	9/28/1990
9/28/1990	12/20/2000	5/26/1998	11/2/1995	9/6/1994	3/4/1994	3.0785	1.3897	11.6410	-15.7646	-13.7222	9/28/2001	9/30/1998	9/30/1998	9/28/1990	9/28/1990
9/30/1998	12/22/2008	5/28/2006	11/4/2003	9/8/2002	3/6/2002	1.0744	5.3432	0.6239	0.2354	-1.7414	3/31/2009	9/28/2007	12/31/2003	9/30/2002	9/28/2001
12/31/1999	3/24/2010	8/28/2007	2/3/2005	12/9/2003	6/6/2003	-3.9304	0.3384	-0.3727	0.2354	2.2778	3/31/2009	9/28/2007	12/31/2004	12/31/2003	12/31/2003
9/28/2001	12/21/2011	5/26/2009	11/2/2006	9/6/2005	3/4/2005	-0.9078	-0.6144	3.6136	-2.7325	-0.6900	9/30/2011	3/31/2009	9/28/2007	12/31/2004	12/31/2004
9/30/2002	12/22/2012	5/28/2010	11/4/2007	9/8/2006	3/6/2006	-4.9270	-4.6335	-0.4056	4.2107	-4.7092	9/30/2011	3/31/2009	9/28/2007	9/28/2007	12/31/2004
12/31/2003	3/24/2014	8/28/2011	2/3/2009	12/9/2007	6/6/2007	3.0785	0.3603	0.6129	-0.7941	1.2484	12/31/2014	9/30/2011	3/31/2009	9/28/2007	9/28/2007
9/30/2004	12/23/2014	5/28/2012	11/4/2009	9/8/2008	3/6/2008	0.0778	-2.6404	-2.3878	2.2285	-1.7523	12/31/2014	9/30/2011	3/31/2009	3/31/2009	9/28/2007
12/31/2004	3/25/2015	8/28/2012	2/4/2010	12/9/2008	6/6/2008	-0.9297	-3.6479	-3.3953	1.2210	-2.7598	12/31/2014	9/30/2011	3/31/2009	3/31/2009	9/28/2007
9/28/2007	12/20/2017	5/26/2015	11/1/2012	9/6/2011	3/4/2011	1.6986	1.3897	-4.3590	0.2573	2.2997	5/25/2018	9/30/2015	9/30/2011	9/30/2011	9/30/2011
3/31/2009		11/26/2016	5/5/2014	3/9/2013	9/4/2012		-4.6335	2.6280	-5.7660	-3.7236		9/30/2015	12/31/2014	9/30/2011	9/30/2011
9/30/2011			11/3/2016	9/8/2015	3/6/2015			-4.3809	0.2354	-0.7119			9/30/2015	9/30/2015	12/31/2014
12/31/2014					6/6/2018					-0.1315					5/25/2018
9/30/2015															
5/25/2018															

Table 8: Summary of expected turning points, closest match and difference for DJIA Months (Set 1) 1915-1959

	EXPECTED TURNING POINTS					DIFFERENCES IN MONTHS					CLOSEST MATCH				
Spectral Result	*0.0021604*	*0.0056497*	*0.0079074*	*0.0095494*	*0.0120124*										
No. Mo's	*462.87659*	*177.00152*	*126.46335*	*104.71822*	*83.246989*	*462.877*	*177.002*	*126.463*	*104.718*	*83.247*	*462.8766*	*177.0015*	*126.4634*	*104.7182*	*83.24699*
12/1/1915	6/27/1954	8/31/1930	6/15/1926	8/22/1924	11/7/1922	-10.868	5.044	1.537	-3.724	-0.224	8/1/1953	2/1/1931	8/1/1926	5/1/1924	11/1/1922
7/1/1916	1/26/1955	4/1/1931	1/14/1927	3/23/1925	6/8/1923	17.123	-1.954	-3.457	9.319	0.728	7/1/1956	2/1/1931	10/1/1926	1/1/1926	7/1/1923
11/1/1916	5/29/1955	8/2/1931	5/17/1927	7/24/1925	10/9/1923	13.082	-5.995	-7.498	5.278	2.732	7/1/1956	2/1/1931	10/1/1926	1/1/1926	1/1/1924
2/1/1917	8/29/1955	11/2/1931	8/17/1927	10/24/1925	1/9/1924	10.060	6.949	-10.521	2.255	-0.290	7/1/1956	6/1/1932	10/1/1926	1/1/1926	1/1/1924
5/1/1917	11/26/1955	1/30/1932	11/14/1927	1/21/1926	4/7/1924	7.136	4.025	-13.445	-0.669	0.761	7/1/1956	6/1/1932	10/1/1926	1/1/1926	5/1/1924
11/1/1917	5/28/1956	8/1/1932	5/16/1928	7/24/1926	10/8/1924	1.091	-0.016	11.491	0.251	-5.284	7/1/1956	8/1/1932	5/1/1929	8/1/1926	5/1/1924
10/1/1918	4/27/1957	7/1/1933	4/15/1929	6/23/1927	9/7/1925	2.109	1.003	0.518	-8.718	3.784	7/1/1957	8/1/1933	5/1/1929	10/1/1926	1/1/1926
1/1/1919	7/28/1957	10/1/1933	7/16/1929	9/23/1927	12/8/1925	-0.914	-0.016	0.518	-11.741	0.761	7/1/1957	10/1/1933	8/1/1929	10/1/1926	1/1/1926
10/1/1919	4/27/1958	7/1/1934	4/15/1930	6/22/1928	9/7/1926	-4.856	-0.016	-1.486	10.272	0.761	12/1/1957	7/1/1934	3/1/1930	5/1/1929	10/1/1926
12/1/1920	6/28/1959	9/1/1935	6/16/1931	8/23/1929	11/8/1927	0.072	-6.061	-4.443	-0.735	-13.268	7/1/1959	3/1/1935	2/1/1931	8/1/1929	10/1/1926
4/1/1921	10/27/1959	12/31/1935	10/15/1931	12/22/1929	3/8/1928	1.123	-10.036	7.549	-1.687	13.739	12/1/1959	3/1/1935	6/1/1932	11/1/1929	5/1/1929
8/1/1921	2/26/1960	5/1/1936	2/14/1932	4/23/1930	7/8/1928	1.123	9.052	3.541	-1.753	9.730	4/1/1960	2/1/1937	6/1/1932	3/1/1930	5/1/1929
8/1/1922	2/25/1961	5/1/1937	2/13/1933	4/23/1931	7/8/1929	-5.842	-2.940	-0.402	-2.673	0.761	9/1/1960	2/1/1937	2/1/1933	2/1/1931	8/1/1929
11/1/1922	5/28/1961	8/1/1937	5/16/1933	7/24/1931	10/8/1929	6.117	-5.963	2.522	-5.696	0.761	12/1/1961	2/1/1937	8/1/1933	2/1/1931	11/1/1929
2/1/1923	8/28/1961	11/1/1937	8/16/1933	10/24/1931	1/8/1930	3.095	3.927	-0.500	7.249	1.681	12/1/1961	3/1/1938	8/1/1933	6/1/1932	3/1/1930
7/1/1923	1/25/1962	3/31/1938	1/13/1934	3/22/1932	6/7/1930	-1.833	-1.002	-0.402	2.321	-3.247	12/1/1961	3/1/1938	1/1/1934	6/1/1932	3/1/1930
1/1/1924	7/28/1962	10/1/1938	7/16/1934	9/22/1932	12/8/1930	-1.899	1.988	-0.500	-1.720	1.780	6/1/1962	12/1/1938	7/1/1934	8/1/1932	2/1/1931
5/1/1924	11/26/1962	1/30/1939	11/14/1934	1/21/1933	4/8/1931	-5.875	-1.987	3.508	0.350	-2.196	6/1/1962	12/1/1938	3/1/1935	2/1/1933	2/1/1931
1/1/1926	7/28/1964	10/1/1940	7/16/1936	9/23/1934	12/8/1932	8.089	-0.016	6.563	-2.772	1.780	4/1/1965	10/1/1940	2/1/1937	7/1/1934	2/1/1933
3/1/1926	9/25/1964	11/29/1940	9/13/1936	11/21/1934	2/5/1933	6.150	-1.954	4.625	3.274	-0.159	4/1/1965	10/1/1940	2/1/1937	3/1/1935	2/1/1933
8/1/1926	2/25/1965	5/1/1941	2/13/1937	4/23/1935	7/8/1933	1.123	-1.002	-0.402	-1.753	0.761	4/1/1965	4/1/1941	2/1/1937	3/1/1935	8/1/1933
10/1/1926	4/27/1965	7/1/1941	4/15/1937	6/23/1935	9/7/1933	-0.881	-0.016	-2.406	-3.757	0.761	4/1/1965	7/1/1941	2/1/1937	3/1/1935	10/1/1933
5/1/1929	11/26/1967	1/30/1944	11/14/1939	1/21/1938	4/7/1936	2.175	-2.973	-1.453	1.269	9.829	2/1/1968	11/1/1943	10/1/1939	3/1/1938	2/1/1937
8/1/1929	2/26/1968	5/1/1944	2/14/1940	4/23/1938	7/8/1936	-0.848	1.003	2.522	-1.753	6.806	2/1/1968	6/1/1944	5/1/1940	3/1/1938	2/1/1937
11/1/1929	5/28/1968	8/1/1944	5/16/1940	7/24/1938	10/8/1936	-1.899	-2.020	-0.500	4.259	3.784	4/1/1968	6/1/1944	5/1/1940	12/1/1938	2/1/1937
3/1/1930	9/25/1968	11/29/1944	9/13/1940	11/21/1938	2/5/1937	1.189	-5.963	0.584	0.317	-0.159	11/1/1968	6/1/1944	10/1/1940	12/1/1938	2/1/1937
2/1/1931	8/28/1969	11/1/1945	8/16/1941	10/24/1939	1/8/1938	-4.922	5.931	-1.519	-0.767	1.681	4/1/1969	5/1/1946	7/1/1941	10/1/1939	3/1/1938
6/1/1932	12/27/1970	3/2/1947	12/15/1942	2/21/1941	5/9/1939	3.095	1.955	5.512	1.269	-1.276	4/1/1971	5/1/1947	6/1/1943	4/1/1941	4/1/1939
8/1/1932	2/26/1971	5/2/1947	2/14/1943	4/23/1941	7/9/1939	1.091	-0.049	3.508	-0.735	2.732	4/1/1971	5/1/1947	6/1/1943	4/1/1941	10/1/1939
2/1/1933	8/29/1971	11/2/1947	8/17/1943	10/24/1941	1/9/1940	2.076	2.974	2.489	-3.790	-3.313	11/1/1971	2/1/1948	11/1/1943	7/1/1941	10/1/1939
8/1/1933	2/26/1972	5/1/1948	2/14/1944	4/23/1942	7/8/1940	-3.870	-0.016	-3.457	-0.735	-2.261	11/1/1971	5/1/1948	11/1/1943	4/1/1942	5/1/1940
10/1/1933	4/27/1972	7/1/1948	4/15/1944	6/23/1942	9/7/1940	2.109	-2.020	1.537	-2.739	0.761	7/1/1972	5/1/1948	6/1/1944	4/1/1942	10/1/1940
1/1/1934	7/28/1972	10/1/1948	7/16/1944	9/23/1942	12/8/1940	-0.914	1.003	-1.486	-5.761	-2.261	7/1/1972	11/1/1948	6/1/1944	4/1/1942	10/1/1940
7/1/1934	1/25/1973	3/31/1949	1/13/1945	3/23/1943	6/7/1941	-1.833	2.021	-7.433	2.288	0.761	12/1/1972	6/1/1949	6/1/1944	6/1/1943	7/1/1941
3/1/1935	9/25/1973	11/29/1949	9/13/1945	11/21/1943	2/5/1942	0.171	-5.963	7.549	-0.669	1.780	10/1/1973	6/1/1949	5/1/1946	11/1/1943	4/1/1942
2/1/1937	8/29/1975	11/2/1951	8/17/1947	10/24/1945	1/9/1944	0.072	-2.053	-1.552	6.198	-2.294	9/1/1975	9/1/1951	7/1/1947	5/1/1946	11/1/1943
3/1/1938	9/25/1976	11/29/1952	9/13/1948	11/21/1946	2/5/1945	2.175	0.050	1.602	1.335	-8.208	12/1/1976	12/1/1952	11/1/1948	1/1/1947	6/1/1944
12/1/1938	6/27/1977	8/31/1953	6/15/1949	8/23/1947	11/7/1945	-6.860	-1.002	-0.467	-1.753	5.722	12/1/1976	8/1/1953	6/1/1949	7/1/1947	5/1/1946
4/1/1939	10/26/1977	12/30/1953	10/14/1949	12/22/1947	3/8/1946	3.193	-4.977	-4.443	1.335	1.747	2/1/1978	8/1/1953	6/1/1949	2/1/1948	5/1/1946
10/1/1939	4/27/1978	7/1/1954	4/15/1950	6/22/1948	9/7/1946	-2.819	-10.989	-10.455	-1.720	0.761	2/1/1978	8/1/1953	6/1/1949	5/1/1948	10/1/1946
5/1/1940	11/26/1978	1/30/1955	11/14/1950	1/21/1949	4/8/1947	-1.866	17.003	6.530	-2.673	0.728	10/1/1978	7/1/1956	6/1/1951	11/1/1948	5/1/1947
10/1/1940	4/28/1979	7/2/1955	4/16/1951	6/23/1949	9/8/1947	-1.932	11.976	1.504	-0.735	-2.294	3/1/1979	7/1/1956	6/1/1951	6/1/1949	7/1/1947
4/1/1941	10/27/1979	12/31/1955	10/15/1951	12/22/1949	3/8/1948	-0.881	5.996	-1.453	-6.714	-1.210	10/1/1979	7/1/1956	9/1/1951	6/1/1949	2/1/1948
7/1/1941	1/26/1980	3/31/1956	1/14/1952	3/23/1950	6/7/1948	1.123	3.007	2.555	-9.704	-1.243	3/1/1980	7/1/1956	4/1/1952	6/1/1949	5/1/1948
4/1/1942	10/26/1980	12/30/1956	10/14/1952	12/22/1950	3/8/1949	4.113	1.068	-0.435	5.278	2.765	3/1/1981	2/1/1957	10/1/1952	6/1/1951	6/1/1949
6/1/1943	12/26/1981	3/1/1958	12/14/1953	2/21/1952	5/8/1950	-3.838	-2.973	-4.443	1.302	-11.231	9/1/1981	12/1/1957	8/1/1953	4/1/1952	6/1/1949
11/1/1943	5/28/1982	8/1/1958	5/16/1954	7/23/1952	10/8/1950	1.091	-7.999	-9.470	2.288	7.726	7/1/1982	12/1/1957	8/1/1953	10/1/1952	6/1/1951
6/1/1944	12/27/1982	3/2/1959	12/15/1954	2/21/1953	5/9/1951	3.095	3.959	-16.467	-2.706	0.728	4/1/1983	7/1/1959	8/1/1953	12/1/1952	6/1/1951
5/1/1946	11/25/1984	1/29/1961	11/13/1956	1/21/1955	4/7/1953	-3.838	-4.944	2.621	17.302	3.784	8/1/1984	9/1/1960	2/1/1957	7/1/1956	8/1/1953
10/1/1946	4/27/1985	7/1/1961	4/15/1957	6/23/1955	9/7/1953	-8.864	5.011	-2.406	12.276	-1.243	8/1/1984	12/1/1961	2/1/1957	7/1/1956	8/1/1953
1/1/1947	7/28/1985	10/1/1961	7/16/1957	9/23/1955	12/8/1953	-11.887	1.988	-0.500	9.253	-4.265	8/1/1984	12/1/1961	7/1/1957	7/1/1956	8/1/1953
5/1/1947	11/25/1985	1/29/1962	11/13/1957	1/21/1956	4/7/1954	9.173	-1.954	0.584	5.311	-8.208	9/1/1986	12/1/1961	12/1/1957	7/1/1956	8/1/1953
7/1/1947	1/25/1986	3/31/1962	1/13/1958	3/22/1956	6/7/1954	7.169	2.021	-1.420	3.306	-10.212	9/1/1986	6/1/1962	12/1/1957	7/1/1956	8/1/1953
2/1/1948	8/28/1986	11/1/1962	8/16/1958	10/23/1956	1/8/1955	0.105	-5.043	-8.484	3.306	-17.276	9/1/1986	6/1/1962	12/1/1957	2/1/1957	8/1/1953
5/1/1948	11/26/1986	1/30/1963	11/14/1958	1/21/1957	4/8/1955	-2.852	-7.999	7.516	0.350	14.757	9/1/1986	6/1/1962	7/1/1959	2/1/1957	7/1/1956
11/1/1948	5/29/1987	8/2/1963	5/17/1959	7/24/1957	10/9/1955	2.076	-14.045	1.471	-0.767	8.712	8/1/1987	6/1/1962	7/1/1959	7/1/1957	7/1/1956
6/1/1949	12/27/1987	3/1/1964	12/15/1959	2/21/1958	5/8/1956	-1.866	12.994	-0.467	-2.706	1.747	11/1/1987	4/1/1965	12/1/1959	12/1/1957	7/1/1956
6/1/1951	12/26/1989	3/1/1966	12/14/1961	2/21/1960	5/8/1958	0.171	-1.954	-0.435	1.302	-5.218	1/1/1990	1/1/1966	12/1/1961	4/1/1960	12/1/1957
9/1/1951	3/28/1990	6/1/1966	3/16/1962	5/23/1960	8/8/1958	-2.852	3.007	2.522	0.284	-8.241	1/1/1990	9/1/1966	6/1/1962	6/1/1960	12/1/1957
4/1/1952	10/27/1990	12/31/1966	10/15/1962	12/22/1960	3/9/1959	-0.881	-3.991	-4.476	-3.692	3.718	10/1/1990	9/1/1966	6/1/1962	9/1/1960	7/1/1959
10/1/1952	4/28/1991	7/2/1967	4/16/1963	6/23/1961	9/8/1959	6.117	1.988	-10.488	5.278	-2.294	11/1/1991	9/1/1967	6/1/1962	12/1/1961	7/1/1959
12/1/1952	6/28/1991	9/1/1967	6/16/1963	8/23/1961	11/8/1959	4.113	-0.016	-12.492	3.274	0.728	11/1/1991	9/1/1967	6/1/1962	12/1/1961	12/1/1959
8/1/1953	2/26/1992	5/1/1968	2/14/1964	4/23/1962	7/8/1960	2.109	-1.002	13.528	1.269	-1.243	5/1/1992	4/1/1968	4/1/1965	6/1/1962	6/1/1960
7/1/1956	1/26/1995	4/1/1971	1/14/1967	3/23/1965	6/8/1963	-2.852	-0.016	-4.443	0.284	-12.249	11/1/1994	4/1/1971	9/1/1966	4/1/1965	6/1/1962
2/1/1957	8/29/1995	11/2/1971	8/17/1967	10/24/1965	1/9/1964	-9.916	-0.049	0.485	2.255	14.691	11/1/1994	11/1/1971	9/1/1967	1/1/1966	4/1/1965
7/1/1957	1/26/1996	3/31/1972	1/14/1968	3/23/1966	6/7/1964	5.132	3.007	0.584	-2.673	9.763	7/1/1996	7/1/1972	2/1/1968	1/1/1966	4/1/1965
12/1/1957	6/27/1996	8/31/1972	6/15/1968	8/23/1966	11/7/1964	0.105	-2.020	-2.472	0.284	4.737	7/1/1996	7/1/1972	4/1/1968	9/1/1966	4/1/1965
7/1/1959	1/25/1998	3/31/1974	1/13/1970	3/22/1968	6/7/1966	2.142	-4.944	4.559	0.317	2.798	4/1/1998	11/1/1973	6/1/1970	4/1/1968	9/1/1966
12/1/1959	6/27/1998	8/31/1974	6/15/1970	8/22/1968	11/7/1966	1.123	0.017	-0.467	2.321	-2.229	8/1/1998	9/1/1974	6/1/1970	11/1/1968	9/1/1966

Table 9: Summary of expected turning points, closest match and difference for DJIA Months (Set 1) 1960-1999

	EXPECTED TURNING POINTS					DIFFERENCES IN MONTHS					CLOSEST MATCH				
Spectral Result	*0.0021604*	*0.0056497*	*0.0079074*	*0.0095494*	*0.0120124*										
No. Mo's	*462.87659*	*177.00152*	*126.46335*	*104.71822*	*83.246989*	*462.877*	*177.002*	*126.463*	*104.718*	*83.247*	*462.8766*	*177.0015*	*126.4634*	*104.7182*	*83.24699*
4/1/1960	10/27/1998	12/31/1974	10/15/1970	12/22/1968	3/9/1967	-2.885	-3.991	-4.476	-1.687	5.755	8/1/1998	9/1/1974	6/1/1970	11/1/1968	9/1/1967
6/1/1960	12/27/1998	3/2/1975	12/15/1970	2/21/1969	5/9/1967	-4.889	2.974	3.508	1.269	3.751	8/1/1998	6/1/1975	4/1/1971	4/1/1969	9/1/1967
9/1/1960	3/29/1999	6/2/1975	3/17/1971	5/24/1969	8/9/1967	2.076	-0.049	0.485	-1.753	0.728	6/1/1999	6/1/1975	4/1/1971	4/1/1969	9/1/1967
12/1/1961	6/27/2000	8/31/1976	6/15/1972	8/23/1970	11/7/1968	1.123	-3.006	0.518	-2.739	-0.224	8/1/2000	6/1/1976	7/1/1972	6/1/1970	11/1/1968
6/1/1962	12/26/2000	3/1/1977	12/14/1972	2/21/1971	5/8/1969	2.109	-2.973	-0.435	1.269	-1.243	3/1/2001	12/1/1976	12/1/1972	4/1/1971	4/1/1969
4/1/1965	10/27/2003	12/31/1979	10/15/1975	12/22/1973	3/8/1972	3.160	1.988	-1.453	-1.687	3.751	2/1/2004	3/1/1980	9/1/1975	11/1/1973	7/1/1972
6/1/1965	12/27/2003	3/1/1980	12/15/1975	2/21/1974	5/8/1972	1.156	-0.016	-3.457	-3.692	1.747	2/1/2004	3/1/1980	9/1/1975	11/1/1973	7/1/1972
1/1/1966	7/28/2004	10/1/1980	7/16/1976	9/23/1974	12/8/1972	2.109	4.945	-1.486	-0.735	-0.257	10/1/2004	3/1/1981	6/1/1976	9/1/1974	12/1/1972
9/1/1966	3/28/2005	6/1/1981	3/16/1977	5/24/1975	8/8/1973	0.105	3.007	-3.457	0.251	1.747	4/1/2005	9/1/1981	12/1/1976	6/1/1975	10/1/1973
9/1/1967	3/28/2006	6/1/1982	3/16/1978	5/23/1976	8/8/1974	-11.887	0.970	-1.420	0.284	0.761	4/1/2005	7/1/1982	2/1/1978	6/1/1976	9/1/1974
2/1/1968	8/28/2006	11/1/1982	8/16/1978	10/23/1976	1/8/1975	13.082	-4.057	-0.500	1.269	-4.265	10/1/2007	7/1/1982	8/1/1978	12/1/1976	9/1/1974
4/1/1968	10/27/2006	12/31/1982	10/15/1978	12/22/1976	3/9/1975	11.111	2.974	-0.467	-0.702	2.732	10/1/2007	4/1/1983	10/1/1978	12/1/1976	6/1/1975
11/1/1968	5/29/2007	8/2/1983	5/17/1979	7/24/1977	10/9/1975	4.080	2.974	2.489	6.296	-1.276	10/1/2007	11/1/1983	8/1/1979	2/1/1978	9/1/1975
4/1/1969	10/27/2007	12/31/1983	10/15/1979	12/22/1977	3/8/1976	-0.881	-1.987	-0.467	1.335	2.765	10/1/2007	11/1/1983	10/1/1979	2/1/1978	6/1/1976
6/1/1970	12/26/2008	3/1/1985	12/14/1980	2/21/1979	5/8/1977	1.189	-6.981	2.522	0.251	-5.218	2/1/2009	8/1/1984	3/1/1981	3/1/1979	12/1/1976
4/1/1971	10/26/2009	12/30/1985	10/14/1981	12/22/1979	3/8/1978	5.132	8.033	-1.420	2.288	-1.177	4/1/2010	9/1/1986	9/1/1981	3/1/1980	2/1/1978
11/1/1971	5/28/2010	8/1/1986	5/16/1982	7/23/1980	10/8/1978	0.105	1.003	1.504	-4.743	-0.257	6/1/2010	9/1/1986	7/1/1982	3/1/1980	10/1/1978
7/1/1972	1/26/2011	4/1/1987	1/14/1983	3/23/1981	6/8/1979	2.109	3.992	2.522	-0.735	1.747	4/1/2011	8/1/1987	4/1/1983	3/1/1981	8/1/1979
12/1/1972	6/28/2011	9/1/1987	6/16/1983	8/23/1981	11/8/1979	2.109	-1.034	-2.504	0.284	-1.276	9/1/2011	8/1/1987	4/1/1983	9/1/1981	10/1/1979
10/1/1973	4/27/2012	7/1/1988	4/15/1984	6/23/1982	9/7/1980	0.105	-7.999	0.518	0.251	5.722	5/1/2012	11/1/1987	5/1/1984	7/1/1982	3/1/1981
11/1/1973	5/28/2012	8/1/1988	5/16/1984	7/24/1982	10/8/1980	-0.914	-9.018	-0.500	-0.767	4.704	5/1/2012	11/1/1987	5/1/1984	7/1/1982	3/1/1981
9/1/1974	3/28/2013	6/1/1989	3/16/1985	5/24/1983	8/8/1981	4.113	5.996	-7.465	-1.753	0.761	8/1/2013	12/1/1989	8/1/1984	4/1/1983	9/1/1981
6/1/1975	12/26/2013	3/1/1990	12/14/1985	2/21/1984	5/8/1982	-4.856	-1.954	8.567	2.288	1.747	8/1/2013	1/1/1990	9/1/1986	5/1/1984	7/1/1982
9/1/1975	3/28/2014	6/1/1990	3/16/1986	5/23/1984	8/8/1982	-7.879	0.970	5.545	-0.735	-1.276	8/1/2013	7/1/1990	9/1/1986	5/1/1984	7/1/1982
6/1/1976	12/27/2014	3/2/1991	12/15/1986	2/21/1985	5/9/1983	1.156	-5.010	-3.457	-6.714	-1.276	2/1/2015	10/1/1990	9/1/1986	8/1/1984	4/1/1983
12/1/1976	6/28/2015	9/1/1991	6/16/1987	8/23/1985	11/8/1983	2.109	1.988	1.504	12.276	-0.257	9/1/2015	11/1/1991	8/1/1987	9/1/1986	11/1/1983
2/1/1978	8/28/2016	11/1/1992	8/16/1988	10/24/1986	1/8/1985	-9.916	-1.034	-9.502	-1.753	-5.284	11/1/2015	10/1/1992	11/1/1987	9/1/1986	8/1/1984
8/1/1978	2/25/2017	5/1/1993	2/13/1989	4/23/1987	7/8/1985	10.158	-6.981	9.553	3.274	-11.231	1/1/2018	10/1/1992	12/1/1989	8/1/1987	8/1/1984
10/1/1978	4/27/2017	7/1/1993	4/15/1989	6/23/1987	9/7/1985	8.154	6.029	7.549	1.269	11.767	1/1/2018	1/1/1994	12/1/1989	8/1/1987	9/1/1986
3/1/1979	9/25/2017	11/29/1993	9/13/1989	11/21/1987	2/5/1986	3.193	1.068	2.588	-0.669	6.806	1/1/2018	1/1/1994	12/1/1989	11/1/1987	9/1/1986
8/1/1979	2/25/2018	5/1/1994	2/13/1990	4/22/1988	7/8/1986	0.105	1.003	-1.420	-5.696	1.780	3/1/2018	6/1/1994	1/1/1990	11/1/1987	9/1/1986
10/1/1979	4/27/2018	7/1/1994	4/15/1990	6/22/1988	9/7/1986	-1.899	-1.002	2.522	-7.700	-0.224	3/1/2018	6/1/1994	7/1/1990	11/1/1987	9/1/1986
3/1/1980		11/30/1994	9/14/1990	11/21/1988	2/6/1987		-0.969	0.551	12.308	-5.218		11/1/1994	10/1/1990	12/1/1989	9/1/1986
3/1/1981		11/30/1995	9/14/1991	11/21/1989	2/6/1988		7.015	1.570	0.317	-3.214		7/1/1996	11/1/1991	12/1/1989	11/1/1987
9/1/1981		6/1/1996	3/16/1992	5/24/1990	8/8/1988		0.970	1.504	1.237	-9.259		7/1/1996	5/1/1992	7/1/1990	11/1/1987
7/1/1982		3/31/1997	1/13/1993	3/23/1991	6/7/1989		3.007	-3.424	-5.696	5.788		7/1/1997	10/1/1992	10/1/1990	12/1/1989
4/1/1983		12/30/1997	10/14/1993	12/22/1991	3/8/1990		-2.973	2.588	-1.687	-2.196		10/1/1997	1/1/1994	11/1/1991	1/1/1990
11/1/1983		8/1/1998	5/16/1994	7/23/1992	10/8/1990		-0.016	0.518	2.288	-0.257		8/1/1998	6/1/1994	10/1/1992	10/1/1990
5/1/1984		1/30/1999	11/14/1994	1/21/1993	4/8/1991		3.992	-0.435	-3.692	-6.237		6/1/1999	11/1/1994	10/1/1992	10/1/1990
8/1/1984		5/2/1999	2/14/1995	4/23/1993	7/9/1991		0.970	-3.457	-6.714	3.751		6/1/1999	11/1/1994	10/1/1992	11/1/1991
9/1/1986		6/1/2001	3/16/1997	5/24/1995	8/8/1993		-1.034	3.508	-6.714	4.769		5/1/2001	7/1/1997	11/1/1994	1/1/1994
8/1/1987		5/1/2002	2/13/1998	4/22/1996	7/8/1994		-2.020	1.537	2.288	0.761		3/1/2002	4/1/1998	7/1/1996	8/1/1994
11/1/1987		8/1/2002	5/16/1998	7/23/1996	10/8/1994		1.003	-1.486	-0.735	0.761		9/1/2002	4/1/1998	7/1/1996	11/1/1994
12/1/1989		8/31/2004	6/15/2000	8/23/1998	11/7/1996		1.003	1.537	-0.735	-4.265		10/1/2004	8/1/2000	8/1/1998	7/1/1996
1/1/1990		10/1/2004	7/16/2000	9/23/1998	12/8/1996		-0.016	0.518	-1.753	-5.284		10/1/2004	8/1/2000	8/1/1998	7/1/1996
7/1/1990		3/31/2005	1/13/2001	3/23/1999	6/7/1997		0.017	1.537	2.288	0.761		4/1/2005	3/1/2001	6/1/1999	7/1/1997
10/1/1990		7/1/2005	4/15/2001	6/23/1999	9/7/1997		-3.006	0.518	-0.735	0.761		4/1/2005	5/1/2001	6/1/1999	10/1/1997
11/1/1991		8/1/2006	5/16/2002	7/23/2000	10/8/1998		13.980	-2.504	0.284	-2.261		10/1/2007	3/1/2002	8/1/2000	8/1/1998
5/1/1992		1/30/2007	11/14/2002	1/21/2001	4/8/1999		8.001	-0.435	1.269	1.747		10/1/2007	11/1/2002	3/1/2001	6/1/1999
10/1/1992		7/2/2007	4/16/2003	6/23/2001	9/8/1999		2.974	-2.439	-1.753	-0.257		10/1/2007	2/1/2003	5/1/2001	9/1/1999
1/1/1994		10/1/2008	7/16/2004	9/23/2002	12/8/2000		4.025	2.522	-0.735	2.700		2/1/2009	10/1/2004	9/1/2002	3/1/2001
6/1/1994		3/1/2009	12/14/2004	2/21/2003	5/8/2001		-0.936	-0.435	-0.669	-0.257		2/1/2009	12/1/2004	2/1/2003	5/1/2001
8/1/1994		5/1/2009	2/13/2005	4/23/2003	7/8/2001		-2.940	1.537	-2.673	1.780		2/1/2009	4/1/2005	2/1/2003	9/1/2001
11/1/1994		8/1/2009	5/16/2005	7/24/2003	10/8/2001		-5.963	-1.486	-5.696	-1.243		2/1/2009	4/1/2005	2/1/2003	9/1/2001
7/1/1996		4/1/2011	1/14/2007	3/23/2005	6/8/2003		-0.016	8.535	0.284	-4.200		4/1/2011	10/1/2007	4/1/2005	2/1/2003
7/1/1997		3/31/2012	1/14/2008	3/23/2006	6/7/2004		0.017	-3.457	-11.708	3.784		4/1/2012	10/1/2007	4/1/2005	10/1/2004
10/1/1997		7/1/2012	4/15/2008	6/23/2006	9/7/2004		-2.020	-6.480	-14.731	0.761		5/1/2012	10/1/2007	4/1/2005	10/1/2004
4/1/1998		12/30/2012	10/14/2008	12/22/2006	3/8/2005		7.015	3.606	9.286	0.761		8/1/2013	2/1/2009	10/1/2007	4/1/2005
8/1/1998		5/1/2013	2/13/2009	4/23/2007	7/8/2005		3.007	-0.402	5.278	-3.247		8/1/2013	2/1/2009	10/1/2007	4/1/2005
6/1/1999		3/1/2014	12/14/2009	2/21/2008	5/8/2006		-6.981	3.541	-4.710	-13.235		8/1/2013	4/1/2010	10/1/2007	4/1/2005
9/1/1999		6/1/2014	3/16/2010	5/23/2008	8/8/2006		8.033	0.518	-7.733	13.739		2/1/2015	4/1/2010	10/1/2007	10/1/2007
12/1/1999		8/31/2014	6/15/2010	8/22/2008	11/7/2006		5.044	-0.467	5.343	10.749		2/1/2015	6/1/2010	2/1/2009	10/1/2007

Table 10: Summary of expected turning points, closest match and difference for DJIA Months (Set 1) 2000-2018

	EXPECTED TURNING POINTS					DIFFERENCES IN MONTHS					CLOSEST MATCH				
Spectral Result	*0.0021604*	*0.0056497*	*0.0079074*	*0.0095494*	*0.0120124*										
No. Mo's	*462.87659*	*177.00152*	*126.46335*	*104.71822*	*83.246989*	*462.877*	*177.002*	*126.463*	*104.718*	*83.247*	*462.8766*	*177.0015*	*126.4634*	*104.7182*	*83.24699*
2/1/2000		11/1/2014	8/16/2010	10/23/2008	1/8/2007		3.007	-2.504	3.306	8.712		2/1/2015	6/1/2010	2/1/2009	10/1/2007
8/1/2000		5/2/2015	2/14/2011	4/23/2009	7/9/2007		-2.973	1.504	-2.673	2.732		2/1/2015	4/1/2011	2/1/2009	10/1/2007
3/1/2001		11/30/2015	9/14/2011	11/21/2009	2/6/2008		-0.969	-0.435	4.292	-4.233		11/1/2015	9/1/2011	4/1/2010	10/1/2007
5/1/2001		1/30/2016	11/14/2011	1/21/2010	4/7/2008		-2.973	-2.439	2.288	-6.237		11/1/2015	9/1/2011	4/1/2010	10/1/2007
9/1/2001		6/1/2016	3/16/2012	5/24/2010	8/8/2008		-7.014	0.518	0.251	5.788		11/1/2015	4/1/2012	6/1/2010	2/1/2009
3/1/2002		11/29/2016	9/13/2012	11/21/2010	2/5/2009		-12.960	-4.443	4.292	-0.159		11/1/2015	5/1/2012	4/1/2011	2/1/2009
9/1/2002		6/1/2017	3/16/2013	5/24/2011	8/8/2009		7.015	4.526	-1.753	-6.204		1/1/2018	8/1/2013	4/1/2011	2/1/2009
11/1/2002		8/1/2017	5/16/2013	7/24/2011	10/8/2009		5.011	2.522	1.269	5.722		1/1/2018	8/1/2013	9/1/2011	4/1/2010
2/1/2003		11/1/2017	8/16/2013	10/24/2011	1/8/2010		1.988	-0.500	-1.753	2.700		1/1/2018	8/1/2013	9/1/2011	4/1/2010
2/1/2004			8/16/2014	10/23/2012	1/8/2011			5.545	-5.761	2.700			2/1/2015	5/1/2012	4/1/2011
10/1/2004			4/16/2015	6/23/2013	9/8/2011			-2.439	1.269	-0.257			2/1/2015	8/1/2013	9/1/2011
12/1/2004			6/16/2015	8/23/2013	11/8/2011			2.522	-0.735	-2.261			9/1/2015	8/1/2013	9/1/2011
4/1/2005			10/15/2015	12/22/2013	3/8/2012			0.551	-4.710	0.761			11/1/2015	8/1/2013	4/1/2012
10/1/2007			4/15/2018	6/22/2016	9/7/2014			-1.486	-7.700	4.802			3/1/2018	11/1/2015	2/1/2015
2/1/2009				10/24/2017	1/9/2016				2.255	-2.294				1/1/2018	11/1/2015
4/1/2010					3/8/2017					9.796					1/1/2018
6/1/2010					5/8/2017					7.792					1/1/2018
4/1/2011					3/8/2018					-0.257					3/1/2018
9/1/2011															
4/1/2012															
5/1/2012															
8/1/2013															
2/1/2015															
9/1/2015															
11/1/2015															
1/1/2018															
3/1/2018															

Table 11: Summary of expected turning points, closest match and difference for DJIA Months (Set 2) 1915-1959

	EXPECTED TURNING POINTS				DIFFERENCES IN MONTHS				CLOSEST MATCH			
Spectral Result	*0.0161175*	*0.0249433*	*0.029664*	*0.0415686*								
No. Mo's	*62.044497*	*40.091001*	*33.710868*	*24.056632*	*62.044*	*40.091*	*33.711*	*24.057*	*62.0445*	*40.091*	*33.71087*	*24.05663*
12/1/1915	1/31/1921	4/4/1919	9/22/1918	12/2/1917	1.956	-3.064	0.293	-1.026	4/1/1921	1/1/1919	10/1/1918	11/1/1917
7/1/1916	9/1/1921	11/3/1919	4/23/1919	7/3/1918	-1.034	-1.093	-3.682	2.950	8/1/1921	10/1/1919	1/1/1919	10/1/1918
11/1/1916	1/2/1922	3/5/1920	8/24/1919	11/3/1918	-5.075	-5.134	1.246	-1.092	8/1/1921	10/1/1919	10/1/1919	10/1/1918
2/1/1917	4/4/1922	6/5/1920	11/24/1919	2/3/1919	3.894	5.872	-1.777	-1.092	8/1/1922	12/1/1920	10/1/1919	1/1/1919
5/1/1917	7/2/1922	9/2/1920	2/21/1920	5/3/1919	0.970	2.948	-4.701	-4.016	8/1/1922	12/1/1920	10/1/1919	1/1/1919
11/1/1917	1/2/1923	3/5/1921	8/23/1920	11/3/1919	0.970	0.878	3.283	-1.092	2/1/1923	4/1/1921	12/1/1920	10/1/1919
10/1/1918	12/2/1923	2/2/1922	7/23/1921	10/2/1920	0.970	5.905	0.293	1.964	1/1/1924	8/1/1922	8/1/1921	12/1/1920
1/1/1919	3/3/1924	5/5/1922	10/23/1921	1/2/1921	1.923	2.882	-2.729	-1.059	5/1/1924	8/1/1922	8/1/1921	12/1/1920
10/1/1919	12/1/1924	2/2/1923	7/23/1922	10/2/1921	-7.047	-0.042	0.293	-2.044	5/1/1924	2/1/1923	8/1/1922	8/1/1921
12/1/1920	2/1/1926	4/4/1924	9/23/1923	12/3/1922	0.904	0.878	-2.762	-1.059	3/1/1926	5/1/1924	7/1/1923	11/1/1922
4/1/1921	6/2/1926	8/3/1924	1/22/1924	4/3/1923	1.956	-3.097	-0.692	-2.011	8/1/1926	5/1/1924	1/1/1924	2/1/1923
8/1/1921	10/2/1926	12/3/1924	5/23/1924	8/3/1923	-0.049	-7.105	-0.725	-1.092	10/1/1926	5/1/1924	5/1/1924	7/1/1923
8/1/1922	10/2/1927	12/3/1925	5/23/1925	8/2/1924	-12.040	0.944	7.324	-3.063	10/1/1926	1/1/1926	1/1/1926	5/1/1924
11/1/1922	1/2/1928	3/5/1926	8/23/1925	11/2/1924	-15.063	-0.140	4.301	-6.085	10/1/1926	3/1/1926	1/1/1926	5/1/1924
2/1/1923	4/3/1928	6/5/1926	11/23/1925	2/2/1925	12.896	1.864	1.279	-9.108	5/1/1929	8/1/1926	1/1/1926	5/1/1924
7/1/1923	8/31/1928	11/2/1926	4/22/1926	7/2/1925	7.968	-1.060	-1.711	6.005	5/1/1929	10/1/1926	3/1/1926	1/1/1926
1/1/1924	3/3/1929	5/5/1927	10/23/1926	1/2/1926	1.923	-7.105	-0.725	-0.040	5/1/1929	10/1/1926	10/1/1926	1/1/1926
5/1/1924	7/2/1929	9/3/1927	2/21/1927	5/3/1926	0.970	-11.081	-4.701	-2.077	8/1/1929	10/1/1926	10/1/1926	3/1/1926
1/1/1926	3/4/1931	5/5/1929	10/23/1928	1/3/1928	-1.034	-0.140	6.240	-15.087	2/1/1931	5/1/1929	5/1/1929	10/1/1926
3/1/1926	5/2/1931	7/3/1929	12/21/1928	3/2/1928	-2.973	0.944	4.301	13.956	2/1/1931	8/1/1929	5/1/1929	5/1/1929
8/1/1926	10/2/1931	12/3/1929	5/23/1929	8/2/1928	7.968	-1.060	-0.725	8.929	6/1/1932	11/1/1929	5/1/1929	5/1/1929
10/1/1926	12/2/1931	2/2/1930	7/23/1929	10/2/1928	5.964	0.878	0.293	6.925	6/1/1932	3/1/1930	8/1/1929	5/1/1929
5/1/1929	7/2/1934	9/2/1932	2/21/1932	5/3/1931	-0.049	-1.060	3.316	-2.997	7/1/1934	8/1/1932	6/1/1932	2/1/1931
8/1/1929	10/2/1934	12/3/1932	5/23/1932	8/3/1931	-3.071	1.962	0.293	-6.020	7/1/1934	2/1/1933	6/1/1932	2/1/1931
11/1/1929	1/2/1935	3/5/1933	8/23/1932	11/3/1931	1.890	-1.060	-0.725	6.925	3/1/1935	2/1/1933	8/1/1932	6/1/1932
3/1/1930	5/2/1935	7/3/1933	12/21/1932	3/2/1932	-2.053	0.944	1.377	2.982	3/1/1935	8/1/1933	2/1/1933	6/1/1932
2/1/1931	4/3/1936	6/5/1934	11/23/1933	2/2/1933	9.972	0.845	1.279	-0.040	2/1/1937	7/1/1934	1/1/1934	2/1/1933
6/1/1932	8/2/1937	10/4/1935	3/24/1935	6/3/1934	-5.995	-7.138	-0.758	0.913	2/1/1937	3/1/1935	3/1/1935	7/1/1934
8/1/1932	10/2/1937	12/4/1935	5/24/1935	8/3/1934	4.912	-9.142	-2.762	-1.092	3/1/1938	3/1/1935	3/1/1935	7/1/1934
2/1/1933	4/4/1938	6/5/1936	11/24/1935	2/3/1935	-1.133	7.909	-8.807	0.847	3/1/1938	2/1/1937	3/1/1935	3/1/1935
8/1/1933	10/2/1938	12/3/1936	5/23/1936	8/3/1935	1.956	1.962	8.343	-5.100	12/1/1938	2/1/1937	2/1/1937	3/1/1935
10/1/1933	12/2/1938	2/2/1937	7/23/1936	10/3/1935	-0.049	-0.042	6.338	-7.104	12/1/1938	2/1/1937	2/1/1937	3/1/1935
1/1/1934	3/4/1939	5/5/1937	10/23/1936	1/3/1936	0.904	-3.064	3.316	-10.126	4/1/1939	2/1/1937	2/1/1937	3/1/1935
7/1/1934	9/1/1939	11/2/1937	4/22/1937	7/2/1936	0.970	3.901	-2.631	7.023	10/1/1939	3/1/1938	2/1/1937	2/1/1937
3/1/1935	5/1/1940	7/3/1938	12/21/1937	3/2/1937	-0.016	-4.083	2.297	-0.960	5/1/1940	3/1/1938	3/1/1938	2/1/1937
2/1/1937	4/4/1942	6/5/1940	11/24/1939	2/3/1939	-0.114	-1.159	-1.777	1.865	4/1/1942	5/1/1940	10/1/1939	4/1/1939
3/1/1938	5/2/1943	7/3/1941	12/21/1940	3/2/1940	0.970	-0.075	-2.664	1.964	6/1/1943	7/1/1941	10/1/1940	5/1/1940
12/1/1938	2/1/1944	4/4/1942	9/22/1941	12/2/1940	-3.038	-0.107	-2.729	-2.044	11/1/1943	4/1/1942	7/1/1941	10/1/1940
4/1/1939	6/1/1944	8/3/1942	1/21/1942	4/2/1941	-0.016	-4.083	2.297	-0.040	6/1/1944	4/1/1942	4/1/1942	4/1/1941
10/1/1939	12/1/1944	2/2/1943	7/23/1942	10/2/1941	-6.028	3.901	-3.715	-3.063	6/1/1944	6/1/1943	4/1/1942	7/1/1941
5/1/1940	7/2/1945	9/3/1943	2/21/1943	5/3/1942	9.939	1.930	3.283	-1.059	5/1/1946	11/1/1943	6/1/1943	4/1/1942
10/1/1940	12/2/1945	2/3/1944	7/24/1943	10/3/1942	4.912	-3.097	-1.744	-6.085	5/1/1946	11/1/1943	6/1/1943	4/1/1942
4/1/1941	6/2/1946	8/3/1944	1/22/1944	4/3/1943	-1.067	-2.079	-2.696	1.931	5/1/1946	6/1/1944	11/1/1943	6/1/1943
7/1/1941	9/1/1946	11/2/1944	4/22/1944	7/3/1943	0.970	-5.068	1.312	-1.059	10/1/1946	6/1/1944	6/1/1944	6/1/1943
4/1/1942	6/2/1947	8/3/1945	1/21/1945	4/2/1944	0.937	8.895	-7.690	1.964	7/1/1947	5/1/1946	6/1/1944	6/1/1944
6/1/1943	8/1/1948	10/3/1946	3/23/1946	6/2/1945	3.007	-0.075	1.279	10.933	11/1/1948	10/1/1946	5/1/1946	5/1/1946
11/1/1943	1/1/1949	3/5/1947	8/23/1946	11/2/1945	-2.020	1.864	1.279	5.906	11/1/1948	5/1/1947	10/1/1946	5/1/1946
6/1/1944	8/2/1949	10/4/1947	3/24/1947	6/3/1946	-2.053	-3.130	1.246	-1.092	6/1/1949	7/1/1947	5/1/1947	5/1/1946
5/1/1946	7/2/1951	9/2/1949	2/20/1949	5/2/1948	-1.034	-3.064	3.316	-0.040	6/1/1951	6/1/1949	6/1/1949	5/1/1948
10/1/1946	12/2/1951	2/2/1950	7/23/1949	10/2/1948	-3.038	-8.091	-1.711	0.978	9/1/1951	6/1/1949	6/1/1949	11/1/1948
1/1/1947	3/3/1952	5/5/1950	10/23/1949	1/2/1949	0.937	-11.114	-4.733	-2.044	4/1/1952	6/1/1949	6/1/1949	11/1/1948
5/1/1947	7/1/1952	9/2/1950	2/20/1950	5/2/1949	-3.005	8.927	-8.676	0.978	4/1/1952	6/1/1951	6/1/1949	6/1/1949
7/1/1947	8/31/1952	11/2/1950	4/22/1950	7/2/1949	1.003	6.923	-10.680	-1.026	10/1/1952	6/1/1951	6/1/1949	6/1/1949
2/1/1948	4/3/1953	6/5/1951	11/23/1950	2/2/1950	3.927	-0.140	6.240	-8.089	8/1/1953	6/1/1951	6/1/1951	6/1/1949
5/1/1948	7/2/1953	9/3/1951	2/21/1951	5/3/1950	0.970	-0.075	3.283	-11.046	8/1/1953	9/1/1951	6/1/1951	6/1/1949
11/1/1948	1/2/1954	3/5/1952	8/24/1951	11/3/1950	-5.075	0.878	0.260	6.892	8/1/1953	4/1/1952	9/1/1951	6/1/1951
6/1/1949	8/2/1954	10/3/1952	3/23/1952	6/3/1951	-12.040	-0.075	0.293	-0.073	8/1/1953	10/1/1952	4/1/1952	6/1/1951
6/1/1951	8/1/1956	10/3/1954	3/23/1954	6/2/1953	-1.034	-14.070	-7.690	1.964	7/1/1956	8/1/1953	8/1/1953	8/1/1953
9/1/1951	11/1/1956	1/3/1955	6/23/1954	9/2/1953	3.007	-17.093	-10.713	-1.059	2/1/1957	8/1/1953	8/1/1953	8/1/1953
4/1/1952	6/2/1957	8/4/1955	1/22/1955	4/3/1954	0.937	10.899	17.279	-8.057	7/1/1957	7/1/1956	7/1/1956	8/1/1953
10/1/1952	12/2/1957	2/3/1956	7/24/1955	10/3/1954	-0.049	4.886	11.267	-14.069	12/1/1957	7/1/1956	7/1/1956	8/1/1953
12/1/1952	2/1/1958	4/4/1956	9/23/1955	12/3/1954	-2.053	2.882	9.262	-16.073	12/1/1957	7/1/1956	7/1/1956	8/1/1953
8/1/1953	10/2/1958	12/3/1956	5/23/1956	8/3/1955	8.921	1.962	1.279	10.933	7/1/1959	2/1/1957	7/1/1956	7/1/1956
7/1/1956	9/1/1961	11/3/1959	4/23/1959	7/3/1958	2.974	0.911	2.264	-7.038	12/1/1961	12/1/1959	7/1/1959	12/1/1957
2/1/1957	4/4/1962	6/5/1960	11/24/1959	2/3/1959	1.890	-0.140	0.228	4.855	6/1/1962	6/1/1960	12/1/1959	7/1/1959
7/1/1957	9/1/1962	11/2/1960	4/22/1960	7/3/1959	-3.038	-2.046	-0.692	-0.073	6/1/1962	9/1/1960	4/1/1960	7/1/1959
12/1/1957	2/1/1963	4/4/1961	9/22/1960	12/3/1959	-8.065	-7.073	-0.692	-0.073	6/1/1962	9/1/1960	9/1/1960	12/1/1959
7/1/1959	8/31/1964	11/2/1962	4/22/1962	7/2/1961	6.982	-5.068	1.312	4.986	4/1/1965	6/1/1962	6/1/1962	12/1/1961
12/1/1959	1/31/1965	4/4/1963	9/22/1962	12/2/1961	1.956	-10.095	-3.715	-0.040	4/1/1965	6/1/1962	6/1/1962	12/1/1961

Table 12: Summary of expected turning points, closest match and difference for DJIA Months (Set 2) 1960-1999

	EXPECTED TURNING POINTS				DIFFERENCES IN MONTHS				CLOSEST MATCH			
Spectral Result	*0.0161175*	*0.0249433*	*0.029664*	*0.0415686*								
No. Mo's	*62.044497*	*40.091001*	*33.710868*	*24.056632*	*62.044*	*40.091*	*33.711*	*24.057*	*62.0445*	*40.091*	*33.71087*	*24.05663*
4/1/1960	6/2/1965	8/4/1963	1/22/1963	4/3/1962	-0.049	-14.103	-7.723	1.931	6/1/1965	6/1/1962	6/1/1962	6/1/1962
6/1/1960	8/2/1965	10/4/1963	3/24/1963	6/3/1962	-2.053	-16.107	-9.727	-0.073	6/1/1965	6/1/1962	6/1/1962	6/1/1962
9/1/1960	11/2/1965	1/4/1964	6/24/1963	9/3/1962	1.956	14.874	-12.750	-3.096	1/1/1966	4/1/1965	6/1/1962	6/1/1962
12/1/1961	2/1/1967	4/4/1965	9/22/1964	12/3/1963	-5.042	-0.107	6.273	15.927	9/1/1966	4/1/1965	4/1/1965	4/1/1965
6/1/1962	8/2/1967	10/3/1965	3/23/1965	6/2/1964	0.970	2.948	0.293	9.947	9/1/1967	1/1/1966	4/1/1965	4/1/1965
4/1/1965	6/2/1970	8/3/1968	1/22/1968	4/3/1967	-0.049	2.948	0.326	4.954	6/1/1970	11/1/1968	2/1/1968	9/1/1967
6/1/1965	8/2/1970	10/3/1968	3/23/1968	6/3/1967	-2.053	0.944	0.293	2.950	6/1/1970	11/1/1968	4/1/1968	9/1/1967
1/1/1966	3/4/1971	5/5/1969	10/23/1968	1/3/1968	0.904	-1.126	0.293	0.945	4/1/1971	4/1/1969	11/1/1968	2/1/1968
9/1/1966	11/2/1971	1/3/1970	6/23/1969	9/2/1968	-0.049	4.886	-2.729	1.964	11/1/1971	6/1/1970	4/1/1969	11/1/1968
9/1/1967	11/1/1972	1/3/1971	6/23/1970	9/2/1969	0.970	2.882	-0.725	-5.067	12/1/1972	4/1/1971	6/1/1970	4/1/1969
2/1/1968	4/3/1973	6/5/1971	11/23/1970	2/2/1970	-4.057	-2.144	4.236	3.902	12/1/1972	4/1/1971	4/1/1971	6/1/1970
4/1/1968	6/2/1973	8/4/1971	1/22/1971	4/3/1970	3.960	2.915	2.264	1.931	10/1/1973	11/1/1971	4/1/1971	6/1/1970
11/1/1968	1/2/1974	3/5/1972	8/24/1971	11/3/1970	-2.053	3.868	2.264	4.888	11/1/1973	7/1/1972	11/1/1971	4/1/1971
4/1/1969	6/2/1974	8/3/1972	1/22/1972	4/3/1971	2.974	-1.093	-2.696	-0.073	9/1/1974	7/1/1972	11/1/1971	4/1/1971
6/1/1970	8/2/1975	10/3/1973	3/23/1973	6/2/1972	0.970	-0.075	-3.682	0.945	9/1/1975	10/1/1973	12/1/1972	7/1/1972
4/1/1971	6/1/1976	8/3/1974	1/21/1974	4/2/1973	-0.016	0.944	-2.664	-4.016	6/1/1976	9/1/1974	11/1/1973	12/1/1972
11/1/1971	1/1/1977	3/5/1975	8/23/1974	11/2/1973	-1.034	2.882	0.293	-0.040	12/1/1976	6/1/1975	9/1/1974	11/1/1973
7/1/1972	9/1/1977	11/3/1975	4/23/1975	7/3/1974	5.011	-2.079	1.279	1.964	2/1/1978	9/1/1975	6/1/1975	9/1/1974
12/1/1972	2/1/1978	4/4/1976	9/23/1975	12/3/1974	-0.016	1.897	-0.725	-3.063	2/1/1978	6/1/1976	9/1/1975	9/1/1974
10/1/1973	12/2/1978	2/2/1977	7/23/1976	10/3/1975	-2.053	-2.079	-1.711	-1.059	10/1/1978	12/1/1976	6/1/1976	9/1/1975
11/1/1973	1/2/1979	3/5/1977	8/23/1976	11/3/1975	1.890	-3.097	-2.729	-2.077	3/1/1979	12/1/1976	6/1/1976	9/1/1975
9/1/1974	11/2/1979	1/3/1978	6/23/1977	9/2/1976	-1.067	0.944	-6.705	2.950	10/1/1979	2/1/1978	12/1/1976	12/1/1976
6/1/1975	8/1/1980	10/3/1978	3/23/1978	6/2/1977	-5.042	-0.075	-1.645	-6.020	3/1/1980	10/1/1978	2/1/1978	12/1/1976
9/1/1975	11/1/1980	1/3/1979	6/23/1978	9/2/1977	3.927	1.864	1.279	4.986	3/1/1981	3/1/1979	8/1/1978	2/1/1978
6/1/1976	8/2/1981	10/4/1979	3/24/1979	6/3/1978	0.970	-0.107	-0.758	1.931	9/1/1981	10/1/1979	3/1/1979	8/1/1978
12/1/1976	2/1/1982	4/4/1980	9/23/1979	12/3/1978	4.912	-1.126	0.260	-2.077	7/1/1982	3/1/1980	10/1/1979	10/1/1978
2/1/1978	4/4/1983	6/5/1981	11/23/1980	2/3/1980	-0.114	2.882	3.217	0.880	4/1/1983	9/1/1981	3/1/1981	3/1/1980
8/1/1978	10/2/1983	12/3/1981	5/23/1981	8/2/1980	0.970	-3.064	-2.729	-5.067	11/1/1983	9/1/1981	3/1/1981	3/1/1980
10/1/1978	12/2/1983	2/2/1982	7/23/1981	10/2/1980	-1.034	4.886	1.312	4.921	11/1/1983	7/1/1982	9/1/1981	3/1/1981
3/1/1979	5/1/1984	7/3/1982	12/21/1981	3/2/1981	-0.016	-0.075	-3.649	-0.040	5/1/1984	7/1/1982	9/1/1981	3/1/1981
8/1/1979	10/1/1984	12/3/1982	5/23/1982	8/2/1981	-2.020	3.901	1.279	0.978	8/1/1984	4/1/1983	7/1/1982	9/1/1981
10/1/1979	12/1/1984	2/2/1983	7/23/1982	10/2/1981	-4.024	1.897	-0.725	-1.026	8/1/1984	4/1/1983	7/1/1982	9/1/1981
3/1/1980	5/2/1985	7/4/1983	12/22/1982	3/3/1982	-9.018	-3.097	3.283	3.935	8/1/1984	4/1/1983	4/1/1983	7/1/1982
3/1/1981	5/2/1986	7/3/1984	12/22/1983	3/3/1983	3.992	0.944	-1.678	0.945	9/1/1986	8/1/1984	11/1/1983	4/1/1983
9/1/1981	11/2/1986	1/3/1985	6/23/1984	9/3/1983	-2.053	-5.101	1.279	1.931	9/1/1986	8/1/1984	8/1/1984	11/1/1983
7/1/1982	9/1/1987	11/2/1985	4/22/1985	7/2/1984	-1.034	9.946	-8.676	0.978	8/1/1987	9/1/1986	8/1/1984	8/1/1984
4/1/1983	6/1/1988	8/3/1986	1/21/1986	4/2/1985	-7.014	0.944	7.324	-8.024	11/1/1987	9/1/1986	9/1/1986	8/1/1984
11/1/1983	1/1/1989	3/5/1987	8/23/1986	11/2/1985	10.958	4.886	0.293	9.947	12/1/1989	8/1/1987	9/1/1986	9/1/1986
5/1/1984	7/2/1989	9/3/1987	2/21/1987	5/3/1986	4.978	-1.093	5.287	3.968	12/1/1989	8/1/1987	8/1/1987	9/1/1986
8/1/1984	10/2/1989	12/4/1987	5/24/1987	8/3/1986	1.956	-1.093	2.264	0.945	12/1/1989	11/1/1987	8/1/1987	9/1/1986
9/1/1986	11/2/1991	1/3/1990	6/23/1989	9/2/1988	-0.049	-0.075	5.287	-10.061	11/1/1991	1/1/1990	12/1/1989	11/1/1987
8/1/1987	10/1/1992	12/3/1990	5/23/1990	8/2/1989	-0.016	-2.079	1.279	3.968	10/1/1992	10/1/1990	7/1/1990	12/1/1989
11/1/1987	1/1/1993	3/5/1991	8/23/1990	11/2/1989	-3.038	-5.101	1.279	0.945	10/1/1992	10/1/1990	10/1/1990	12/1/1989
12/1/1989	2/1/1995	4/4/1993	9/22/1992	12/3/1991	-3.038	-6.087	0.293	-1.059	11/1/1994	10/1/1992	10/1/1992	11/1/1991
1/1/1990	3/4/1995	5/5/1993	10/23/1992	1/3/1992	-4.057	-7.105	-0.725	-2.077	11/1/1994	10/1/1992	10/1/1992	11/1/1991
7/1/1990	9/1/1995	11/2/1993	4/22/1993	7/2/1992	9.972	1.962	-6.672	-2.044	7/1/1996	1/1/1994	10/1/1992	5/1/1992
10/1/1990	12/2/1995	2/2/1994	7/23/1993	10/2/1992	6.949	-1.060	5.320	-0.040	7/1/1996	1/1/1994	1/1/1994	10/1/1992
11/1/1991	1/1/1997	3/5/1995	8/23/1994	11/2/1993	5.931	-4.083	-0.725	1.964	7/1/1997	11/1/1994	8/1/1994	1/1/1994
5/1/1992	7/2/1997	9/3/1995	2/21/1995	5/3/1994	-0.049	9.913	-3.682	0.945	7/1/1997	7/1/1996	11/1/1994	6/1/1994
10/1/1992	12/2/1997	2/3/1996	7/24/1995	10/3/1994	-2.053	4.886	-8.709	0.945	10/1/1997	7/1/1996	11/1/1994	11/1/1994
1/1/1994	3/4/1999	5/5/1997	10/23/1996	1/3/1996	2.908	1.864	-3.748	5.906	6/1/1999	7/1/1997	7/1/1996	7/1/1996
6/1/1994	8/2/1999	10/3/1997	3/23/1997	6/2/1996	0.970	-0.075	3.283	0.945	9/1/1999	10/1/1997	7/1/1997	7/1/1996
8/1/1994	10/2/1999	12/3/1997	5/23/1997	8/2/1996	-1.034	-2.079	1.279	-1.059	9/1/1999	10/1/1997	7/1/1997	7/1/1996
11/1/1994	1/2/2000	3/5/1998	8/23/1997	11/2/1996	0.970	0.878	1.279	-4.081	2/1/2000	4/1/1998	10/1/1997	7/1/1996
7/1/1996	9/1/2001	11/3/1999	4/23/1999	7/3/1998	-0.016	0.911	1.279	0.945	9/1/2001	12/1/1999	6/1/1999	8/1/1998
7/1/1997	9/1/2002	11/2/2000	4/22/2000	7/3/1999	-0.016	-3.064	-2.664	-1.059	9/1/2002	8/1/2000	2/1/2000	6/1/1999
10/1/1997	12/2/2002	2/2/2001	7/23/2000	10/3/1999	-1.034	0.878	0.293	-1.059	11/1/2002	3/1/2001	8/1/2000	9/1/1999
4/1/1998	6/2/2003	8/3/2001	1/21/2001	4/2/2000	-3.991	0.944	1.279	-2.011	2/1/2003	9/1/2001	3/1/2001	2/1/2000
8/1/1998	10/2/2003	12/3/2001	5/23/2001	8/2/2000	3.992	2.882	-0.725	-0.040	2/1/2004	3/1/2002	5/1/2001	8/1/2000
6/1/1999	8/1/2004	10/3/2002	3/23/2002	6/2/2001	1.988	0.944	-0.725	-1.059	10/1/2004	11/1/2002	3/1/2002	5/1/2001
9/1/1999	11/1/2004	1/3/2003	6/23/2002	9/2/2001	0.970	0.944	2.297	-0.040	12/1/2004	2/1/2003	9/1/2002	9/1/2001
12/1/1999	1/31/2005	4/4/2003	9/22/2002	12/2/2001	1.956	-2.046	-0.692	2.917	4/1/2005	2/1/2003	9/1/2002	3/1/2002

Table 13: Summary of expected turning points, closest match and difference for DJIA Months (Set 2) 2000-2018

	EXPECTED TURNING POINTS				DIFFERENCES IN MONTHS				CLOSEST MATCH			
Spectral Result	*0.0161175*	*0.0249433*	*0.029664*	*0.0415686*								
No. Mo's	*62.044497*	*40.091001*	*33.710868*	*24.056632*	*62.044*	*40.091*	*33.711*	*24.057*	*62.0445*	*40.091*	*33.71087*	*24.05663*
2/1/2000	4/3/2005	6/5/2003	11/23/2002	2/2/2002	-0.081	-4.083	-0.725	0.880	4/1/2005	2/1/2003	11/1/2002	3/1/2002
8/1/2000	10/2/2005	12/4/2003	5/24/2003	8/3/2002	-6.061	1.930	-3.682	0.945	4/1/2005	2/1/2004	2/1/2003	9/1/2002
3/1/2001	5/2/2006	7/3/2004	12/22/2003	3/3/2003	-13.026	2.948	1.345	-0.993	4/1/2005	10/1/2004	2/1/2004	2/1/2003
5/1/2001	7/2/2006	9/2/2004	2/21/2004	5/3/2003	14.966	0.944	-0.660	-2.997	10/1/2007	10/1/2004	2/1/2004	2/1/2003
9/1/2001	11/2/2006	1/3/2005	6/23/2004	9/3/2003	10.925	-1.093	3.283	4.954	10/1/2007	12/1/2004	10/1/2004	2/1/2004
3/1/2002	5/2/2007	7/3/2005	12/21/2004	3/2/2004	4.978	-3.064	-0.660	-0.993	10/1/2007	4/1/2005	12/1/2004	2/1/2004
9/1/2002	11/2/2007	1/3/2006	6/23/2005	9/2/2004	-1.067	-9.109	-2.729	0.945	10/1/2007	4/1/2005	4/1/2005	10/1/2004
11/1/2002	1/2/2008	3/5/2006	8/23/2005	11/2/2004	-3.071	-11.114	-4.733	0.945	10/1/2007	4/1/2005	4/1/2005	12/1/2004
2/1/2003	4/3/2008	6/5/2006	11/23/2005	2/2/2005	-6.094	-14.136	-7.756	1.898	10/1/2007	4/1/2005	4/1/2005	4/1/2005
2/1/2004	4/3/2009	6/5/2007	11/23/2006	2/2/2006	-2.020	3.868	10.248	-10.094	2/1/2009	10/1/2007	10/1/2007	4/1/2005
10/1/2004	12/2/2009	2/3/2008	7/24/2007	10/3/2006	3.927	-4.116	2.264	11.919	4/1/2010	10/1/2007	10/1/2007	10/1/2007
12/1/2004	2/1/2010	4/4/2008	9/23/2007	12/3/2006	1.923	-6.120	0.260	9.915	4/1/2010	10/1/2007	10/1/2007	10/1/2007
4/1/2005	6/2/2010	8/3/2008	1/22/2008	4/3/2007	-0.049	5.971	-3.715	5.939	6/1/2010	2/1/2009	10/1/2007	10/1/2007
10/1/2007	12/1/2012	2/2/2011	7/23/2010	10/2/2009	-7.047	1.897	-1.711	5.939	5/1/2012	4/1/2011	6/1/2010	4/1/2010
2/1/2009	4/4/2014	6/5/2012	11/24/2011	2/3/2011	-8.098	-1.159	-2.762	1.865	8/1/2013	5/1/2012	9/1/2011	4/1/2011
4/1/2010	6/2/2015	8/3/2013	1/21/2013	4/2/2012	2.974	-0.075	6.306	-0.040	9/1/2015	8/1/2013	8/1/2013	4/1/2012
6/1/2010	8/2/2015	10/3/2013	3/23/2013	6/2/2012	0.970	-2.079	4.301	-1.059	9/1/2015	8/1/2013	8/1/2013	5/1/2012
4/1/2011	6/1/2016	8/3/2014	1/21/2014	4/2/2013	-7.014	5.971	-5.686	3.968	11/1/2015	2/1/2015	8/1/2013	8/1/2013
9/1/2011	11/1/2016	1/3/2015	6/23/2014	9/2/2013	-12.040	0.944	7.324	-1.059	11/1/2015	2/1/2015	2/1/2015	8/1/2013
4/1/2012	6/2/2017	8/4/2015	1/22/2015	4/3/2014	6.982	0.911	0.326	-8.057	1/1/2018	9/1/2015	2/1/2015	8/1/2013
5/1/2012	7/2/2017	9/3/2015	2/21/2015	5/3/2014	5.997	-0.075	-0.660	8.995	1/1/2018	9/1/2015	2/1/2015	2/1/2015
8/1/2013		12/3/2016	5/23/2016	8/3/2015		12.936	-6.705	0.945		1/1/2018	11/1/2015	9/1/2015
2/1/2015		6/5/2018	11/23/2017	2/2/2017		-3.163	1.279	10.933		3/1/2018	1/1/2018	1/1/2018
9/1/2015			6/23/2018	9/2/2017			-3.748	3.968			3/1/2018	1/1/2018
11/1/2015				11/2/2017				1.964				1/1/2018
1/1/2018												
3/1/2018												

Table 14: Summary of expected turning points, closest match and difference for DJIA Weeks 1985-1992

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
2/25/1985	7/18/1992	7/13/1988	2/11/1987	4/12/1989	1.1946	-3.3451	6.7062	-3.3316	7/27/1992	6/20/1988	3/30/1987	3/20/1989
3/11/1985	8/1/1992	7/27/1988	2/25/1987	4/26/1989	-0.8054	2.6549	4.7062	-5.3316	7/27/1992	8/15/1988	3/30/1987	3/20/1989
4/29/1985	9/19/1992	9/14/1988	4/15/1987	6/14/1989	-0.8054	-4.3451	0.7062	1.6684	9/14/1992	8/15/1988	4/20/1987	6/26/1989
7/15/1985	12/5/1992	11/30/1988	7/1/1987	8/30/1989	2.1946	-2.3451	6.7062	-0.3316	12/21/1992	11/14/1988	8/17/1987	8/28/1989
9/2/1985	1/23/1993	1/18/1989	8/19/1987	10/18/1989	1.1946	1.6549	-0.2938	-1.3316	2/1/1993	1/30/1989	8/17/1987	10/9/1989
9/16/1985	2/6/1993	2/1/1989	9/2/1987	11/1/1989	-0.8054	-0.3451	-2.2938	-3.3316	2/1/1993	1/30/1989	8/17/1987	10/9/1989
1/6/1986	5/29/1993	5/24/1989	12/23/1987	2/21/1990	0.1946	4.6549	-0.2938	-4.3316	5/31/1993	6/26/1989	12/21/1987	1/22/1990
4/14/1986	9/4/1993	8/30/1989	3/30/1988	5/30/1990	-1.8054	-0.3451	0.7062	-5.3316	8/23/1993	8/28/1989	4/4/1988	4/23/1990
5/12/1986	10/2/1993	9/27/1989	4/27/1988	6/27/1990	-1.8054	0.6549	2.7062	1.6684	9/20/1993	10/2/1989	5/16/1988	7/9/1990
6/30/1986	11/20/1993	11/15/1989	6/15/1988	8/15/1990	-8.8054	-5.3451	0.7062	-5.3316	9/20/1993	10/9/1989	6/20/1988	7/9/1990
7/28/1986	12/18/1993	12/13/1989	7/13/1988	9/12/1990	5.1946	2.6549	-3.2938	3.6684	1/24/1994	1/1/1990	6/20/1988	10/8/1990
9/1/1986	1/22/1994	1/17/1990	8/17/1988	10/17/1990	0.1946	0.6549	-0.2938	-1.3316	1/24/1994	1/22/1990	8/15/1988	10/8/1990
9/8/1986	1/29/1994	1/24/1990	8/24/1988	10/24/1990	-0.8054	-0.3451	-1.2938	-2.3316	1/24/1994	1/22/1990	8/15/1988	10/8/1990
3/30/1987	8/20/1994	8/15/1990	3/15/1989	5/15/1991	3.1946	-5.3451	0.7062	-0.3316	9/12/1994	7/9/1990	3/20/1989	5/13/1991
4/20/1987	9/10/1994	9/5/1990	4/5/1989	6/5/1991	0.1946	4.6549	-2.2938	-1.3316	9/12/1994	10/8/1990	3/20/1989	5/27/1991
8/17/1987	1/7/1995	1/2/1991	8/2/1989	10/2/1991	-4.8054	0.6549	3.7062	-0.3316	12/5/1994	1/7/1991	8/28/1989	9/30/1991
9/28/1987	2/18/1995	2/13/1991	9/13/1989	11/13/1991	-10.8054	2.6549	-2.2938	2.6684	12/5/1994	3/4/1991	8/28/1989	12/2/1991
11/30/1987	4/22/1995	4/17/1991	11/15/1989	1/15/1992	13.1946	-0.3451	-5.2938	-0.3316	7/24/1995	4/15/1991	10/9/1989	1/13/1992
12/21/1987	5/13/1995	5/8/1991	12/6/1989	2/5/1992	10.1946	0.6549	3.7062	1.6684	7/24/1995	5/13/1991	1/1/1990	2/17/1992
1/18/1988	6/10/1995	6/5/1991	1/3/1990	3/4/1992	6.1946	-1.3451	-0.2938	-0.3316	7/24/1995	5/27/1991	1/1/1990	3/2/1992
3/21/1988	8/12/1995	8/7/1991	3/7/1990	5/6/1992	1.1946	0.6549	-6.2938	3.6684	8/21/1995	8/12/1991	1/22/1990	6/1/1992
4/4/1988	8/26/1995	8/21/1991	3/21/1990	5/20/1992	-0.8054	0.6549	4.7062	1.6684	8/21/1995	8/26/1991	4/23/1990	6/1/1992
5/16/1988	10/7/1995	10/2/1991	5/2/1990	7/1/1992	2.1946	-0.3451	-1.2938	-1.3316	10/23/1995	9/30/1991	4/23/1990	6/22/1992
6/20/1988	11/11/1995	11/6/1991	6/6/1990	8/5/1992	-2.8054	-3.3451	4.7062	-1.3316	10/23/1995	10/14/1991	7/9/1990	7/27/1992
8/15/1988	1/6/1996	1/1/1992	8/1/1990	9/30/1992	0.1946	1.6549	-3.2938	0.6684	1/8/1996	1/13/1992	7/9/1990	10/5/1992
10/17/1988	3/9/1996	3/4/1992	10/3/1990	12/2/1992	-0.8054	-0.3451	0.7062	2.6684	3/4/1996	3/2/1992	10/8/1990	12/21/1992
11/14/1988	4/6/1996	4/1/1992	10/31/1990	12/30/1992	-0.8054	-4.3451	-3.2938	0.6684	4/1/1996	3/2/1992	10/8/1990	1/4/1993
1/30/1989	6/22/1996	6/17/1992	1/16/1991	3/17/1993	3.1946	0.6549	-1.2938	1.6684	7/15/1996	6/22/1992	1/7/1991	3/29/1993
3/20/1989	8/10/1996	8/5/1992	3/6/1991	5/5/1993	2.1946	-1.3451	-0.2938	-3.3316	8/26/1996	7/27/1992	3/4/1991	4/12/1993
6/26/1989	11/16/1996	11/11/1992	6/12/1991	8/11/1993	3.1946	-5.3451	1.7062	1.6684	12/9/1996	10/5/1992	6/24/1991	8/23/1993
8/28/1989	1/18/1997	1/13/1993	8/14/1991	10/13/1993	-5.8054	-1.3451	-0.2938	-3.3316	12/9/1996	1/4/1993	8/12/1991	9/20/1993
10/2/1989	2/22/1997	2/17/1993	9/18/1991	11/17/1993	1.1946	-2.3451	1.7062	-8.3316	3/3/1997	2/1/1993	9/30/1991	9/20/1993
10/9/1989	3/1/1997	2/24/1993	9/25/1991	11/24/1993	0.1946	-3.3451	0.7062	8.6684	3/3/1997	2/1/1993	9/30/1991	1/24/1994
1/1/1990	5/24/1997	5/19/1993	12/18/1991	2/16/1994	-6.8054	1.6549	-2.2938	-3.3316	4/7/1997	5/31/1993	12/2/1991	1/24/1994
1/22/1990	6/14/1997	6/9/1993	1/8/1992	3/9/1994	6.1946	-1.3451	0.7062	0.6684	7/28/1997	5/31/1993	1/13/1992	3/14/1994
4/23/1990	9/13/1997	9/8/1993	4/8/1992	6/8/1994	-2.8054	1.6549	-5.2938	0.6684	8/25/1997	9/20/1993	3/2/1992	6/13/1994
7/9/1990	11/29/1997	11/24/1993	6/24/1992	8/24/1994	0.1946	8.6549	-0.2938	2.6684	12/1/1997	1/24/1994	6/22/1992	9/12/1994
10/8/1990	2/28/1998	2/23/1994	9/23/1992	11/23/1994	6.1946	2.6549	-1.2938	1.6684	4/13/1998	3/14/1994	9/14/1992	12/5/1994
1/7/1991	5/30/1998	5/25/1994	12/23/1992	2/22/1995	2.1946	2.6549	-0.2938	-11.3316	6/15/1998	6/13/1994	12/21/1992	12/5/1994
3/4/1991	7/25/1998	7/20/1994	2/17/1993	4/19/1995	-1.8054	-4.3451	-2.2938	13.6684	7/13/1998	6/20/1994	2/1/1993	7/24/1995
3/18/1991	8/8/1998	8/3/1994	3/3/1993	5/3/1995	3.1946	5.6549	3.7062	11.6684	8/31/1998	9/12/1994	3/29/1993	7/24/1995
4/15/1991	9/5/1998	8/31/1994	3/31/1993	5/31/1995	-0.8054	1.6549	-0.2938	7.6684	8/31/1998	9/12/1994	3/29/1993	7/24/1995
5/13/1991	10/3/1998	9/28/1994	4/28/1993	6/28/1995	-4.8054	0.6549	-2.2938	3.6684	8/31/1998	10/3/1994	4/12/1993	7/24/1995
5/27/1991	10/17/1998	10/12/1994	5/12/1993	7/12/1995	5.1946	-1.3451	2.7062	1.6684	11/23/1998	10/3/1994	5/31/1993	7/24/1995
6/24/1991	11/14/1998	11/9/1994	6/9/1993	8/9/1995	1.1946	-2.3451	-1.2938	1.6684	11/23/1998	10/24/1994	5/31/1993	8/21/1995
7/15/1991	12/5/1998	11/30/1994	6/30/1993	8/30/1995	0.1946	0.6549	-0.2938	-1.3316	12/7/1998	12/5/1994	6/28/1993	8/21/1995
8/12/1991	1/2/1999	12/28/1994	7/28/1993	9/27/1995	0.1946	-3.3451	3.7062	-2.3316	1/4/1999	12/5/1994	8/23/1993	9/11/1995
8/26/1991	1/16/1999	1/11/1995	8/11/1993	10/11/1995	0.1946	-5.3451	1.7062	1.6684	1/18/1999	12/5/1994	8/23/1993	10/23/1995
9/30/1991	2/20/1999	2/15/1995	9/15/1993	11/15/1995	-4.8054	-10.3451	0.7062	-3.3316	1/18/1999	12/5/1994	9/20/1993	10/23/1995
10/14/1991	3/6/1999	3/1/1995	9/29/1993	11/29/1995	-6.8054	-12.3451	-1.2938	-5.3316	1/18/1999	12/5/1994	9/20/1993	10/23/1995
12/2/1991	4/24/1999	4/19/1995	11/17/1993	1/17/1996	1.1946	13.6549	-8.2938	-1.3316	5/3/1999	7/24/1995	9/20/1993	1/8/1996
1/13/1992	6/5/1999	5/31/1995	12/29/1993	2/28/1996	0.1946	7.6549	3.7062	0.6684	6/7/1999	7/24/1995	1/24/1994	3/4/1996
2/17/1992	7/10/1999	7/5/1995	2/2/1994	4/3/1996	0.1946	2.6549	-1.2938	-0.3316	7/12/1999	7/24/1995	1/24/1994	4/1/1996
3/2/1992	7/24/1999	7/19/1995	2/16/1994	4/17/1996	0.1946	0.6549	-3.2938	1.6684	7/26/1999	7/24/1995	1/24/1994	4/29/1996
6/1/1992	10/23/1999	10/18/1995	5/18/1994	7/17/1996	-1.8054	0.6549	3.7062	-0.3316	10/11/1999	10/23/1995	6/13/1994	7/15/1996
6/22/1992	11/13/1999	11/8/1995	6/8/1994	8/7/1996	-4.8054	-2.3451	0.7062	2.6684	10/11/1999	10/23/1995	6/13/1994	8/26/1996
7/27/1992	12/18/1999	12/13/1995	7/13/1994	9/11/1996	3.1946	3.6549	-3.2938	-2.3316	1/10/2000	1/8/1996	6/20/1994	8/26/1996
8/17/1992	1/8/2000	1/3/1996	8/3/1994	10/2/1996	0.1946	0.6549	5.7062	-5.3316	1/10/2000	1/8/1996	9/12/1994	8/26/1996
9/14/1992	2/5/2000	1/31/1996	8/31/1994	10/30/1996	2.1946	-3.3451	1.7062	5.6684	2/21/2000	1/8/1996	9/12/1994	12/9/1996
10/5/1992	2/26/2000	2/21/1996	9/21/1994	11/20/1996	-0.8054	1.6549	-1.2938	2.6684	2/21/2000	3/4/1996	9/12/1994	12/9/1996
12/21/1992	5/13/2000	5/8/1996	12/7/1994	2/5/1997	1.1946	-1.3451	-0.2938	3.6684	5/22/2000	4/29/1996	12/5/1994	3/3/1997

Table 15: Summary of expected turning points, closest match and difference for DJIA Weeks 1993-2000

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
1/4/1993	5/27/2000	5/22/1996	12/21/1994	2/19/1997	0.1946	-0.3451	-2.2938	1.6684	5/29/2000	5/20/1996	12/5/1994	3/3/1997
2/1/1993	6/24/2000	6/19/1996	1/18/1995	3/19/1997	-3.8054	3.6549	-6.2938	-2.3316	5/29/2000	7/15/1996	12/5/1994	3/3/1997
3/29/1993	8/19/2000	8/14/1996	3/15/1995	5/14/1997	1.1946	1.6549	-14.2938	-5.3316	8/28/2000	8/26/1996	12/5/1994	4/7/1997
4/12/1993	9/2/2000	8/28/1996	3/29/1995	5/28/1997	-0.8054	-0.3451	-16.2938	-7.3316	8/28/2000	8/26/1996	12/5/1994	4/7/1997
5/31/1993	10/21/2000	10/16/1996	5/17/1995	7/16/1997	1.1946	-7.3451	9.7062	1.6684	10/30/2000	8/26/1996	7/24/1995	7/28/1997
6/28/1993	11/18/2000	11/13/1996	6/14/1995	8/13/1997	1.1946	3.6549	5.7062	1.6684	11/27/2000	12/9/1996	7/24/1995	8/25/1997
8/23/1993	1/13/2001	1/8/1997	8/9/1995	10/8/1997	2.1946	-4.3451	1.7062	-0.3316	1/29/2001	12/9/1996	8/21/1995	10/6/1997
9/20/1993	2/10/2001	2/5/1997	9/6/1995	11/5/1997	-1.8054	3.6549	0.7062	-1.3316	1/29/2001	3/3/1997	9/11/1995	10/27/1997
1/24/1994	6/16/2001	6/11/1997	1/10/1996	3/11/1998	2.1946	6.6549	-0.2938	4.6684	7/2/2001	7/28/1997	1/8/1996	4/13/1998
3/14/1994	8/4/2001	7/30/1997	2/28/1996	4/29/1998	-4.8054	-0.3451	0.7062	-2.3316	7/2/2001	7/28/1997	3/4/1996	4/13/1998
3/28/1994	8/18/2001	8/13/1997	3/13/1996	5/13/1998	4.1946	1.6549	-1.2938	-4.3316	9/17/2001	8/25/1997	3/4/1996	4/13/1998
6/13/1994	11/3/2001	10/29/1997	5/29/1996	7/29/1998	5.1946	-0.3451	-1.2938	-2.3316	12/10/2001	10/27/1997	5/20/1996	7/13/1998
6/20/1994	11/10/2001	11/5/1997	6/5/1996	8/5/1998	4.1946	-1.3451	-2.2938	-3.3316	12/10/2001	10/27/1997	5/20/1996	7/13/1998
9/12/1994	2/2/2002	1/28/1998	8/28/1996	10/28/1998	0.1946	-3.3451	-0.2938	3.6684	2/4/2002	1/5/1998	8/26/1996	11/23/1998
10/3/1994	2/23/2002	2/18/1998	9/18/1996	11/18/1998	2.1946	-6.3451	-3.2938	0.6684	3/11/2002	1/5/1998	8/26/1996	11/23/1998
10/24/1994	3/16/2002	3/11/1998	10/9/1996	12/9/1998	-0.8054	4.6549	-6.2938	-0.3316	3/11/2002	4/13/1998	8/26/1996	12/7/1998
12/5/1994	4/27/2002	4/22/1998	11/20/1996	1/20/1999	-0.8054	-1.3451	2.7062	-0.3316	4/22/2002	4/13/1998	12/9/1996	1/18/1999
7/24/1995	12/14/2002	12/9/1998	7/9/1997	9/8/1999	-2.8054	-0.3451	2.7062	-3.3316	11/25/2002	12/7/1998	7/28/1997	8/16/1999
8/21/1995	1/11/2003	1/6/1999	8/6/1997	10/6/1999	-0.8054	-0.3451	-1.2938	0.6684	1/6/2003	1/4/1999	7/28/1997	10/11/1999
9/11/1995	2/1/2003	1/27/1999	8/27/1997	10/27/1999	-3.8054	-1.3451	-0.2938	-2.3316	1/6/2003	1/18/1999	8/25/1997	10/11/1999
10/23/1995	3/15/2003	3/10/1999	10/8/1997	12/8/1999	0.1946	-7.3451	-0.2938	4.6684	3/17/2003	1/18/1999	10/6/1997	1/10/2000
1/8/1996	5/31/2003	5/26/1999	12/24/1997	2/23/2000	2.1946	1.6549	1.7062	-0.3316	6/16/2003	6/7/1999	1/5/1998	2/21/2000
3/4/1996	7/26/2003	7/21/1999	2/18/1998	4/19/2000	-5.8054	0.6549	-6.2938	-1.3316	6/16/2003	7/26/1999	1/5/1998	4/10/2000
4/1/1996	8/23/2003	8/18/1999	3/18/1998	5/17/2000	4.1946	-0.3451	3.7062	0.6684	9/22/2003	8/16/1999	4/13/1998	5/22/2000
4/29/1996	9/20/2003	9/15/1999	4/15/1998	6/14/2000	0.1946	3.6549	-0.2938	-2.3316	9/22/2003	10/11/1999	4/13/1998	5/29/2000
5/20/1996	10/11/2003	10/6/1999	5/6/1998	7/5/2000	-2.8054	0.6549	-3.2938	-5.3316	9/22/2003	10/11/1999	4/13/1998	5/29/2000
7/15/1996	12/6/2003	12/1/1999	7/1/1998	8/30/2000	9.1946	5.6549	1.7062	-0.3316	2/9/2004	1/10/2000	7/13/1998	8/28/2000
8/26/1996	1/17/2004	1/12/2000	8/12/1998	10/11/2000	3.1946	-0.3451	2.7062	-0.3316	2/9/2004	1/10/2000	8/31/1998	10/9/2000
12/9/1996	5/1/2004	4/26/2000	11/25/1998	1/24/2001	-1.8054	-2.3451	-0.2938	0.6684	4/19/2004	4/10/2000	11/23/1998	1/29/2001
3/3/1997	7/24/2004	7/19/2000	2/17/1999	4/18/2001	1.1946	5.6549	-4.2938	3.6684	8/2/2004	8/28/2000	1/18/1999	5/14/2001
4/7/1997	8/28/2004	8/23/2000	3/24/1999	5/23/2001	1.1946	0.6549	5.7062	-1.3316	9/6/2004	8/28/2000	5/3/1999	5/14/2001
7/28/1997	12/18/2004	12/13/2000	7/14/1999	9/12/2001	0.1946	1.6549	-0.2938	0.6684	12/20/2004	12/25/2000	7/12/1999	9/17/2001
8/25/1997	1/15/2005	1/10/2001	8/11/1999	10/10/2001	0.1946	-2.3451	0.7062	-3.3316	1/17/2005	12/25/2000	8/16/1999	9/17/2001
10/6/1997	2/26/2005	2/21/2001	9/22/1999	11/21/2001	0.1946	-3.3451	2.7062	2.6684	2/28/2005	1/29/2001	10/11/1999	12/10/2001
10/27/1997	3/19/2005	3/14/2001	10/13/1999	12/12/2001	-2.8054	0.6549	-0.2938	-0.3316	2/28/2005	3/19/2001	10/11/1999	12/10/2001
12/1/1997	4/23/2005	4/18/2001	11/17/1999	1/16/2002	-1.8054	3.6549	-5.2938	-2.3316	4/11/2005	5/14/2001	10/11/1999	12/31/2001
1/5/1998	5/28/2005	5/23/2001	12/22/1999	2/20/2002	3.1946	-1.3451	2.7062	-2.3316	6/20/2005	5/14/2001	1/10/2000	2/4/2002
4/13/1998	9/3/2005	8/29/2001	3/29/2000	5/29/2002	0.1946	2.6549	-1.2938	-2.3316	9/5/2005	9/17/2001	3/20/2000	5/13/2002
6/15/1998	11/5/2005	10/31/2001	5/31/2000	7/31/2002	2.1946	5.6549	-0.2938	-2.3316	11/21/2005	12/10/2001	5/29/2000	7/15/2002
7/13/1998	12/3/2005	11/28/2001	6/28/2000	8/28/2002	-1.8054	1.6549	-4.2938	-1.3316	11/21/2005	12/10/2001	5/29/2000	8/19/2002
8/31/1998	1/21/2006	1/16/2002	8/16/2000	10/16/2002	-0.8054	-2.3451	1.7062	-2.3316	1/16/2006	12/31/2001	8/28/2000	9/30/2002
11/23/1998	4/15/2006	4/10/2002	11/8/2000	1/8/2003	2.1946	1.6549	-1.2938	-0.3316	5/1/2006	4/22/2002	10/30/2000	1/6/2003
12/7/1998	4/29/2006	4/24/2002	11/22/2000	1/22/2003	0.1946	-0.3451	0.7062	-2.3316	5/1/2006	4/22/2002	11/27/2000	1/6/2003
1/4/1999	5/27/2006	5/22/2002	12/20/2000	2/19/2003	1.1946	-1.3451	0.7062	1.6684	6/5/2006	5/13/2002	12/25/2000	3/3/2003
1/18/1999	6/10/2006	6/5/2002	1/3/2001	3/5/2003	-0.8054	-3.3451	-1.2938	-0.3316	6/5/2006	5/13/2002	12/25/2000	3/3/2003
5/3/1999	9/23/2006	9/18/2002	4/18/2001	6/18/2003	-10.8054	1.6549	3.7062	-0.3316	7/10/2006	9/30/2002	5/14/2001	6/16/2003
6/7/1999	10/28/2006	10/23/2002	5/23/2001	7/23/2003	15.1946	-3.3451	-1.2938	-5.3316	2/12/2007	9/30/2002	5/14/2001	6/16/2003
7/12/1999	12/2/2006	11/27/2002	6/27/2001	8/27/2003	10.1946	-0.3451	0.7062	3.6684	2/12/2007	11/25/2002	7/2/2001	9/22/2003
7/26/1999	12/16/2006	12/11/2002	7/11/2001	9/10/2003	8.1946	-2.3451	-1.2938	1.6684	2/12/2007	11/25/2002	7/2/2001	9/22/2003
8/16/1999	1/6/2007	1/1/2003	8/1/2001	10/1/2003	5.1946	0.6549	-4.2938	-1.3316	2/12/2007	1/6/2003	7/2/2001	9/22/2003
10/11/1999	3/3/2007	2/26/2003	9/26/2001	11/26/2003	1.1946	0.6549	-1.2938	-9.3316	3/12/2007	3/3/2003	9/17/2001	9/22/2003
1/10/2000	6/2/2007	5/28/2003	12/26/2001	2/25/2004	-0.8054	2.6549	0.7062	-2.3316	5/28/2007	6/16/2003	12/31/2001	2/9/2004
2/21/2000	7/14/2007	7/9/2003	2/6/2002	4/7/2004	-0.8054	-3.3451	-0.2938	1.6684	7/9/2007	6/16/2003	2/4/2002	4/19/2004
3/20/2000	8/11/2007	8/6/2003	3/6/2002	5/5/2004	0.1946	6.6549	0.7062	1.6684	8/13/2007	9/22/2003	3/11/2002	5/17/2004
4/10/2000	9/1/2007	8/27/2003	3/27/2002	5/26/2004	-2.8054	3.6549	-2.2938	-1.3316	8/13/2007	9/22/2003	3/11/2002	5/17/2004
5/22/2000	10/13/2007	10/8/2003	5/8/2002	7/7/2004	-0.8054	-2.3451	0.7062	-3.3316	10/8/2007	9/22/2003	5/13/2002	6/14/2004
5/29/2000	10/20/2007	10/15/2003	5/15/2002	7/14/2004	-1.8054	-3.3451	-0.2938	2.6684	10/8/2007	9/22/2003	5/13/2002	8/2/2004
8/28/2000	1/19/2008	1/14/2004	8/14/2002	10/13/2004	-0.8054	3.6549	0.7062	0.6684	1/14/2008	2/9/2004	8/19/2002	10/18/2004
10/9/2000	3/1/2008	2/25/2004	9/25/2002	11/24/2004	0.1946	-2.3451	0.7062	3.6684	3/3/2008	2/9/2004	9/30/2002	12/20/2004
10/30/2000	3/22/2008	3/17/2004	10/16/2002	12/15/2004	-2.8054	-0.3451	-2.2938	0.6684	3/3/2008	3/15/2004	9/30/2002	12/20/2004
11/27/2000	4/19/2008	4/14/2004	11/13/2002	1/12/2005	1.1946	0.6549	1.7062	0.6684	4/28/2008	4/19/2004	11/25/2002	1/17/2005
12/25/2000	5/17/2008	5/12/2004	12/11/2002	2/9/2005	-2.8054	0.6549	-2.2938	2.6684	4/28/2008	5/17/2004	11/25/2002	2/28/2005

Table 16: Summary of expected turning points, closest match and difference for DJIA Weeks 2001-2007

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
1/29/2001	6/21/2008	6/16/2004	1/15/2003	3/16/2005	2.1946	-0.3451	-1.2938	-2.3316	7/7/2008	6/14/2004	1/6/2003	2/28/2005
3/19/2001	8/9/2008	8/4/2004	3/5/2003	5/4/2005	-0.8054	-0.3451	-0.2938	-3.3316	8/4/2008	8/2/2004	3/3/2003	4/11/2005
5/14/2001	10/4/2008	9/29/2004	4/30/2003	6/29/2005	6.1946	2.6549	-6.2938	-1.3316	11/17/2008	10/18/2004	3/17/2003	6/20/2005
7/2/2001	11/22/2008	11/17/2004	6/18/2003	8/17/2005	-0.8054	-4.3451	-0.2938	0.6684	11/17/2008	10/18/2004	6/16/2003	8/22/2005
9/17/2001	2/7/2009	2/2/2005	9/3/2003	11/2/2005	3.1946	-2.3451	2.7062	-2.3316	3/2/2009	1/17/2005	9/22/2003	10/17/2005
12/10/2001	5/2/2009	4/27/2005	11/26/2003	1/25/2006	5.1946	-2.3451	-9.2938	-1.3316	6/8/2009	4/11/2005	9/22/2003	1/16/2006
12/31/2001	5/23/2009	5/18/2005	12/17/2003	2/15/2006	2.1946	4.6549	7.7062	-4.3316	6/8/2009	6/20/2005	2/9/2004	1/16/2006
2/4/2002	6/27/2009	6/22/2005	1/21/2004	3/22/2006	1.1946	-0.3451	2.7062	5.6684	7/6/2009	6/20/2005	2/9/2004	5/1/2006
3/11/2002	8/1/2009	7/27/2005	2/25/2004	4/26/2006	-3.8054	-1.3451	-2.2938	0.6684	7/6/2009	7/18/2005	2/9/2004	5/1/2006
4/22/2002	9/12/2009	9/7/2005	4/7/2004	6/7/2006	-9.8054	-0.3451	1.7062	-0.3316	7/6/2009	9/5/2005	4/19/2004	6/5/2006
5/13/2002	10/3/2009	9/28/2005	4/28/2004	6/28/2006	-12.8054	2.6549	-1.2938	1.6684	7/6/2009	10/17/2005	4/19/2004	7/10/2006
7/15/2002	12/5/2009	11/30/2005	6/30/2004	8/30/2006	4.1946	-1.3451	-2.2938	-7.3316	1/4/2010	11/21/2005	6/14/2004	7/10/2006
8/19/2002	1/9/2010	1/4/2006	8/4/2004	10/4/2006	-0.8054	0.6549	-0.2938	-12.3316	1/4/2010	1/9/2006	8/2/2004	7/10/2006
9/30/2002	2/20/2010	2/15/2006	9/15/2004	11/15/2006	-2.8054	-4.3451	-1.2938	12.6684	2/1/2010	1/16/2006	9/6/2004	2/12/2007
11/25/2002	4/17/2010	4/12/2006	11/10/2004	1/10/2007	0.1946	2.6549	-3.2938	4.6684	4/19/2010	5/1/2006	10/18/2004	2/12/2007
1/6/2003	5/29/2010	5/24/2006	12/22/2004	2/21/2007	2.1946	1.6549	-0.2938	-1.3316	6/14/2010	6/5/2006	12/20/2004	2/12/2007
3/3/2003	7/24/2010	7/19/2006	2/16/2005	4/18/2007	1.1946	-1.3451	1.7062	-5.3316	8/2/2010	7/10/2006	2/28/2005	3/12/2007
3/17/2003	8/7/2010	8/2/2006	3/2/2005	5/2/2007	-0.8054	-3.3451	-0.2938	3.6684	8/2/2010	7/10/2006	2/28/2005	5/28/2007
6/16/2003	11/6/2010	11/1/2006	6/1/2005	8/1/2007	-0.8054	14.6549	2.7062	1.6684	11/1/2010	2/12/2007	6/20/2005	8/13/2007
9/22/2003	2/12/2011	2/7/2007	9/7/2005	11/7/2007	0.1946	0.6549	-0.2938	1.6684	2/14/2011	2/12/2007	9/5/2005	11/19/2007
2/9/2004	7/2/2011	6/27/2007	1/25/2006	3/26/2008	-1.8054	-1.3451	-1.2938	-3.3316	6/20/2011	6/18/2007	1/16/2006	3/3/2008
3/15/2004	8/6/2011	8/1/2007	3/1/2006	4/30/2008	1.1946	1.6549	-6.2938	-0.3316	8/15/2011	8/13/2007	1/16/2006	4/28/2008
4/19/2004	9/10/2011	9/5/2007	4/5/2006	6/4/2008	1.1946	-3.3451	3.7062	4.6684	9/19/2011	8/13/2007	5/1/2006	7/7/2008
5/17/2004	10/8/2011	10/3/2007	5/3/2006	7/2/2008	2.1946	0.6549	-0.2938	0.6684	10/24/2011	10/8/2007	5/1/2006	7/7/2008
6/14/2004	11/5/2011	10/31/2007	5/31/2006	7/30/2008	-1.8054	2.6549	0.7062	0.6684	10/24/2011	11/19/2007	6/5/2006	8/4/2008
8/2/2004	12/24/2011	12/19/2007	7/19/2006	9/17/2008	-4.8054	-2.3451	-1.2938	-6.3316	11/21/2011	12/3/2007	7/10/2006	8/4/2008
9/6/2004	1/28/2012	1/23/2008	8/23/2006	10/22/2008	6.1946	-1.3451	-6.2938	3.6684	3/12/2012	1/14/2008	7/10/2006	11/17/2008
10/18/2004	3/10/2012	3/5/2008	10/4/2006	12/3/2008	0.1946	-0.3451	-12.2938	-2.3316	3/12/2012	3/3/2008	7/10/2006	11/17/2008
12/20/2004	5/12/2012	5/7/2008	12/6/2006	2/4/2009	2.1946	-1.3451	9.7062	3.6684	5/28/2012	4/28/2008	2/12/2007	3/2/2009
1/17/2005	6/9/2012	6/4/2008	1/3/2007	3/4/2009	-1.8054	4.6549	5.7062	-0.3316	5/28/2012	7/7/2008	2/12/2007	3/2/2009
2/28/2005	7/21/2012	7/16/2008	2/14/2007	4/15/2009	5.1946	-1.3451	-0.2938	-6.3316	8/27/2012	7/7/2008	2/12/2007	3/2/2009
4/11/2005	9/1/2012	8/27/2008	3/28/2007	5/27/2009	-0.8054	-3.3451	-2.2938	1.6684	8/27/2012	8/4/2008	3/12/2007	6/8/2009
6/20/2005	11/10/2012	11/5/2008	6/6/2007	8/5/2009	0.1946	1.6549	-1.2938	-4.3316	11/12/2012	11/17/2008	5/28/2007	7/6/2009
7/18/2005	12/8/2012	12/3/2008	7/4/2007	9/2/2009	2.1946	-2.3451	0.7062	-8.3316	12/24/2012	11/17/2008	7/9/2007	7/6/2009
8/22/2005	1/12/2013	1/7/2009	8/8/2007	10/7/2009	-2.8054	-1.3451	0.7062	12.6684	12/24/2012	12/29/2008	8/13/2007	1/4/2010
9/5/2005	1/26/2013	1/21/2009	8/22/2007	10/21/2009	-4.8054	-3.3451	-1.2938	10.6684	12/24/2012	12/29/2008	8/13/2007	1/4/2010
10/17/2005	3/9/2013	3/4/2009	10/3/2007	12/2/2009	9.1946	-0.3451	0.7062	4.6684	5/13/2013	3/2/2009	10/8/2007	1/4/2010
11/21/2005	4/13/2013	4/8/2009	11/7/2007	1/6/2010	4.1946	-5.3451	1.7062	-0.3316	5/13/2013	3/2/2009	11/19/2007	1/4/2010
1/9/2006	6/1/2013	5/27/2009	12/26/2007	2/24/2010	2.1946	1.6549	2.7062	-3.3316	6/17/2013	6/8/2009	1/14/2008	2/1/2010
1/16/2006	6/8/2013	6/3/2009	1/2/2008	3/3/2010	1.1946	0.6549	1.7062	-4.3316	6/17/2013	6/8/2009	1/14/2008	2/1/2010
5/1/2006	9/21/2013	9/16/2009	4/16/2008	6/16/2010	-0.8054	-10.3451	1.7062	-0.3316	9/16/2013	7/6/2009	4/28/2008	6/14/2010
6/5/2006	10/26/2013	10/21/2009	5/21/2008	7/21/2010	-5.8054	10.6549	-3.2938	1.6684	9/16/2013	1/4/2010	4/28/2008	8/2/2010
7/10/2006	11/30/2013	11/25/2009	6/25/2008	8/25/2010	1.1946	5.6549	1.7062	-0.3316	12/9/2013	1/4/2010	7/7/2008	8/23/2010
2/12/2007	7/5/2014	6/30/2010	1/28/2009	3/30/2011	1.1946	-0.3451	-4.2938	-2.3316	7/14/2014	6/28/2010	12/29/2008	3/14/2011
3/12/2007	8/2/2014	7/28/2010	2/25/2009	4/27/2011	-0.8054	0.6549	0.7062	-0.3316	7/28/2014	8/2/2010	3/2/2009	4/25/2011
5/28/2007	10/18/2014	10/13/2010	5/13/2009	7/13/2011	-0.8054	2.6549	3.7062	0.6684	10/13/2014	11/1/2010	6/8/2009	7/18/2011
6/18/2007	11/8/2014	11/3/2010	6/3/2009	8/3/2011	-3.8054	-0.3451	0.7062	1.6684	10/13/2014	11/1/2010	6/8/2009	8/15/2011
7/9/2007	11/29/2014	11/24/2010	6/24/2009	8/24/2011	1.1946	-0.3451	1.7062	-1.3316	12/8/2014	11/22/2010	7/6/2009	8/15/2011
8/13/2007	1/3/2015	12/29/2010	7/29/2009	9/28/2011	-1.8054	-5.3451	-3.2938	-1.3316	12/22/2014	11/22/2010	7/6/2009	9/19/2011
10/8/2007	2/28/2015	2/23/2011	9/23/2009	11/23/2011	-1.8054	-1.3451	-11.2938	-0.3316	2/16/2015	2/14/2011	7/6/2009	11/21/2011
11/19/2007	4/11/2015	4/6/2011	11/4/2009	1/4/2012	-2.8054	2.6549	8.7062	-6.3316	3/23/2015	4/25/2011	1/4/2010	11/21/2011
12/3/2007	4/25/2015	4/20/2011	11/18/2009	1/18/2012	2.1946	0.6549	6.7062	7.6684	5/11/2015	4/25/2011	1/4/2010	3/12/2012

Table 17: Summary of expected turning points, closest match and difference for DJIA Weeks 2008-2018

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
1/14/2008	6/6/2015	6/1/2011	12/30/2009	2/29/2012	-3.8054	2.6549	0.7062	1.6684	5/11/2015	6/20/2011	1/4/2010	3/12/2012
3/3/2008	7/25/2015	7/20/2011	2/17/2010	4/18/2012	-1.8054	-0.3451	-2.2938	0.6684	7/13/2015	7/18/2011	2/1/2010	4/23/2012
4/28/2008	9/19/2015	9/14/2011	4/14/2010	6/13/2012	-2.8054	0.6549	0.7062	-2.3316	8/31/2015	9/19/2011	4/19/2010	5/28/2012
7/7/2008	11/28/2015	11/23/2011	6/23/2010	8/22/2012	-3.8054	-0.3451	0.7062	0.6684	11/2/2015	11/21/2011	6/28/2010	8/27/2012
8/4/2008	12/26/2015	12/21/2011	7/21/2010	9/19/2012	6.1946	-4.3451	1.7062	1.6684	2/8/2016	11/21/2011	8/2/2010	10/1/2012
11/17/2008	4/9/2016	4/4/2012	11/3/2010	1/2/2013	1.1946	2.6549	-0.2938	-1.3316	4/18/2016	4/23/2012	11/1/2010	12/24/2012
12/29/2008	5/21/2016	5/16/2012	12/15/2010	2/13/2013	0.1946	1.6549	-3.2938	-7.3316	5/23/2016	5/28/2012	11/22/2010	12/24/2012
3/2/2009	7/23/2016	7/18/2012	2/16/2011	4/17/2013	2.1946	5.6549	-0.2938	3.6684	8/8/2016	8/27/2012	2/14/2011	5/13/2013
6/8/2009	10/29/2016	10/24/2012	5/25/2011	7/24/2013	0.1946	2.6549	3.7062	0.6684	10/31/2016	11/12/2012	6/20/2011	7/29/2013
7/6/2009	11/26/2016	11/21/2012	6/22/2011	8/21/2013	-3.8054	-1.3451	-0.2938	0.6684	10/31/2016	11/12/2012	6/20/2011	8/26/2013
1/4/2010	5/27/2017	5/22/2013	12/21/2011	2/19/2014	-6.8054	-1.3451	-4.2938	1.6684	4/10/2017	5/13/2013	11/21/2011	3/3/2014
2/1/2010	6/24/2017	6/19/2013	1/18/2012	3/19/2014	5.1946	-0.3451	7.7062	-2.3316	7/31/2017	6/17/2013	3/12/2012	3/3/2014
4/19/2010	9/9/2017	9/4/2013	4/4/2012	6/4/2014	-5.8054	-1.3451	2.7062	5.6684	7/31/2017	8/26/2013	4/23/2012	7/14/2014
6/14/2010	11/4/2017	10/30/2013	5/30/2012	7/30/2014	11.1946	5.6549	-0.2938	-0.3316	1/22/2018	12/9/2013	5/28/2012	7/28/2014
6/28/2010	11/18/2017	11/13/2013	6/13/2012	8/13/2014	9.1946	3.6549	-2.2938	-2.3316	1/22/2018	12/9/2013	5/28/2012	7/28/2014
8/2/2010	12/23/2017	12/18/2013	7/18/2012	9/17/2014	4.1946	0.6549	5.7062	-0.3316	1/22/2018	12/23/2013	8/27/2012	9/15/2014
8/23/2010	1/13/2018	1/8/2014	8/8/2012	10/8/2014	1.1946	-2.3451	2.7062	0.6684	1/22/2018	12/23/2013	8/27/2012	10/13/2014
11/1/2010	3/24/2018	3/19/2014	10/17/2012	12/17/2014	-0.8054	-2.3451	-2.2938	0.6684	3/19/2018	3/3/2014	10/1/2012	12/22/2014
11/22/2010	4/14/2018	4/9/2014	11/7/2012	1/7/2015	-3.8054	-0.3451	0.7062	-2.3316	3/19/2018	4/7/2014	11/12/2012	12/22/2014
2/14/2011	7/7/2018	7/2/2014	1/30/2013	4/1/2015	-4.8054	1.6549	-5.2938	-1.3316	6/4/2018	7/14/2014	12/24/2012	3/23/2015
3/14/2011		7/30/2014	2/27/2013	4/29/2015		-0.3451	-9.2938	1.6684		7/28/2014	12/24/2012	5/11/2015
4/25/2011		9/10/2014	4/10/2013	6/10/2015		0.6549	4.7062	-4.3316		9/15/2014	5/13/2013	5/11/2015
6/20/2011		11/5/2014	6/5/2013	8/5/2015		-3.3451	1.7062	-3.3316		10/13/2014	6/17/2013	7/13/2015
7/18/2011		12/3/2014	7/3/2013	9/2/2015		0.6549	-2.2938	-0.3316		12/8/2014	6/17/2013	8/31/2015
8/15/2011		12/31/2014	7/31/2013	9/30/2015		-1.3451	-0.2938	-4.3316		12/22/2014	7/29/2013	8/31/2015
9/19/2011		2/4/2015	9/4/2013	11/4/2015		-1.3451	-1.2938	-0.3316		1/26/2015	8/26/2013	11/2/2015
10/24/2011		3/11/2015	10/9/2013	12/9/2015		1.6549	-3.2938	-5.3316		3/23/2015	9/16/2013	11/2/2015
11/21/2011		4/8/2015	11/6/2013	1/6/2016		-2.3451	4.7062	4.6684		3/23/2015	12/9/2013	2/8/2016
3/12/2012		7/29/2015	2/26/2014	4/27/2016		-2.3451	0.7062	-1.3316		7/13/2015	3/3/2014	4/18/2016
4/23/2012		9/9/2015	4/9/2014	6/8/2016		-1.3451	-0.2938	1.6684		8/31/2015	4/7/2014	6/20/2016
5/28/2012		10/14/2015	5/14/2014	7/13/2016		2.6549	-5.2938	-3.3316		11/2/2015	4/7/2014	6/20/2016
8/27/2012		1/13/2016	8/13/2014	10/12/2016		3.6549	-2.2938	2.6684		2/8/2016	7/28/2014	10/31/2016
10/1/2012		2/17/2016	9/17/2014	11/16/2016		-1.3451	-0.2938	-2.3316		2/8/2016	9/15/2014	10/31/2016
11/12/2012		3/30/2016	10/29/2014	12/28/2016		2.6549	-2.2938	-8.3316		4/18/2016	10/13/2014	10/31/2016
12/24/2012		5/11/2016	12/10/2014	2/8/2017		0.6549	-0.2938	2.6684		5/16/2016	12/8/2014	2/27/2017
5/13/2013		9/28/2016	4/29/2015	6/28/2017		-3.3451	1.7062	4.6684		9/5/2016	5/11/2015	7/31/2017
6/17/2013		11/2/2016	6/3/2015	8/2/2017		-0.3451	-3.2938	-0.3316		10/31/2016	5/11/2015	7/31/2017
7/29/2013		12/14/2016	7/15/2015	9/13/2017		-6.3451	-0.2938	-6.3316		10/31/2016	7/13/2015	7/31/2017
8/26/2013		1/11/2017	8/12/2015	10/11/2017		6.6549	2.7062	-10.3316		2/27/2017	8/31/2015	7/31/2017
9/16/2013		2/1/2017	9/2/2015	11/1/2017		3.6549	-0.2938	11.6684		2/27/2017	8/31/2015	1/22/2018
12/9/2013		4/26/2017	11/25/2015	1/24/2018		-2.3451	-3.2938	-0.3316		4/10/2017	11/2/2015	1/22/2018
12/23/2013		5/10/2017	12/9/2015	2/7/2018		-4.3451	-5.2938	-0.3316		4/10/2017	11/2/2015	2/5/2018
1/27/2014		6/14/2017	1/13/2016	3/14/2018		6.6549	3.7062	0.6684		7/31/2017	2/8/2016	3/19/2018
3/3/2014		7/19/2017	2/17/2016	4/18/2018		1.6549	-1.2938	-4.3316		7/31/2017	2/8/2016	3/19/2018
4/7/2014		8/23/2017	3/23/2016	5/23/2018		-3.3451	3.7062	1.6684		7/31/2017	4/18/2016	6/4/2018
7/14/2014		11/29/2017	6/29/2016			7.6549	-1.2938			1/22/2018	6/20/2016	
7/28/2014		12/13/2017	7/13/2016			5.6549	-3.2938			1/22/2018	6/20/2016	
9/15/2014		1/31/2018	8/31/2016			0.6549	0.7062			2/5/2018	9/5/2016	
10/13/2014		2/28/2018	9/28/2016			0.6549	-3.2938			3/5/2018	9/5/2016	
12/8/2014		4/25/2018	11/23/2016			-5.3451	-3.2938			3/19/2018	10/31/2016	
12/22/2014		5/9/2018	12/7/2016			3.6549	-5.2938			6/4/2018	10/31/2016	
1/26/2015		6/13/2018	1/11/2017			-1.3451	6.7062			6/4/2018	2/27/2017	
2/16/2015		7/4/2018	2/1/2017			-4.3451	3.7062			6/4/2018	2/27/2017	
3/23/2015			3/8/2017				-1.2938				2/27/2017	
5/11/2015			4/26/2017				-2.2938				4/10/2017	
7/13/2015			6/28/2017				4.7062				7/31/2017	
8/31/2015			8/16/2017				-2.2938				7/31/2017	
11/2/2015			10/18/2017				-11.2938				7/31/2017	
2/8/2016			1/24/2018				-0.2938				1/22/2018	
4/18/2016			4/4/2018				-2.2938				3/19/2018	
5/16/2016			5/2/2018				4.7062				6/4/2018	
5/23/2016			5/9/2018				3.7062				6/4/2018	
6/20/2016			6/6/2018				-0.2938				6/4/2018	
8/8/2016			7/25/2018				-7.2938				6/4/2018	
9/5/2016												

Table 18: Summary of expected turning points, closest match and difference for S&P 500 Quarters 1950-2018

	EXPECTED TURNING POINTS					DIFFERENCES IN QUARTERS					CLOSEST MATCH				
	0.00802636	*0.03741488*	*0.0632765*	*0.07189704*	*0.0345*										
	124.58941	*26.7273338*	*15.8036563*	*13.9087791*	*28.9855072*	*124.5894*	*26.7273*	*15.8037*	*13.9088*	*28.9855*	*124.58941*	*26.7273338*	*15.8036563*	*13.9087791*	*28.9855072*
12/31/52	2/23/1984	9/6/1959	12/13/1956	6/23/1956	3/30/1960	1.3955	-0.7506	-1.8187	0.0762	2.0070	6/30/1984	6/30/1959	6/30/1956	6/30/1956	9/30/1960
6/30/56	8/23/1987	3/6/1963	6/12/1960	12/22/1959	9/28/1963	-0.5976	-1.7253	1.2039	-1.9170	-3.9835	6/30/1987	9/30/1962	9/30/1960	6/30/1959	9/30/1962
9/30/57	11/22/1988	6/5/1964	9/12/1961	3/23/1961	12/28/1964	-5.6024	6.2802	1.2039	-1.9060	4.0220	6/30/1987	12/31/1965	12/31/1961	9/30/1960	12/31/1965
6/30/59	8/22/1990	3/5/1966	6/12/1963	12/21/1962	9/27/1966	0.4209	-0.7068	-2.7934	-0.8985	0.0248	9/30/1990	12/31/1965	9/30/1962	9/30/1962	9/30/1966
9/30/60	11/23/1991	6/6/1967	9/12/1964	3/23/1964	12/29/1967	-4.5949	-2.7328	5.2011	-5.9143	-4.9910	9/30/1990	9/30/1966	12/31/1965	9/30/1962	9/30/1966
12/31/61	2/22/1993	9/5/1968	12/13/1965	6/23/1965	3/30/1969	3.4106	2.2610	0.1963	2.0912	0.0029	12/31/1993	3/31/1969	12/31/1965	12/31/1965	3/31/1969
9/30/62	11/22/1993	6/5/1969	9/12/1966	3/23/1966	12/28/1969	0.4209	-0.7287	0.1963	-0.8985	2.0070	12/31/1993	3/31/1969	9/30/1966	12/31/1965	6/30/1970
12/31/65	2/22/1997	9/5/1972	12/13/1969	6/23/1969	3/30/1973	12.4017	1.2754	2.1785	-0.9204	-0.9828	3/31/2000	12/31/1972	6/30/1970	3/31/1969	12/31/1972
9/30/66	11/22/1997	6/5/1973	9/12/1970	3/23/1970	12/28/1973	9.4120	-1.7143	-0.8112	1.0837	3.0145	3/31/2000	12/31/1972	6/30/1970	6/30/1970	9/30/1974
3/31/69	5/23/2000	12/5/1975	3/13/1973	9/21/1972	6/28/1976	-0.5867	2.2720	-0.7893	1.1056	0.0138	3/31/2000	6/30/1976	12/31/1972	12/31/1972	6/30/1976
6/30/70	8/22/2001	3/5/1977	6/12/1974	12/21/1973	9/27/1977	5.4256	-2.7219	1.2039	3.0988	1.0323	12/31/2002	6/30/1976	9/30/1974	9/30/1974	12/31/1977
12/31/72	2/23/2004	9/6/1979	12/13/1976	6/23/1976	3/30/1980	-4.5949	6.2583	-1.8187	0.0762	4.0001	12/31/2002	3/31/1981	6/30/1976	6/30/1976	3/31/1981
9/30/74	11/22/2005	6/5/1981	9/12/1978	3/23/1978	12/28/1981	7.4079	-0.7287	-2.7934	-0.8985	2.0070	9/30/2007	3/31/1981	12/31/1977	12/31/1977	6/30/1982
6/30/76	8/23/2007	3/6/1983	6/12/1980	12/22/1979	9/28/1983	0.4099	0.2679	3.1970	5.0919	-1.9903	9/30/2007	3/31/1983	3/31/1981	3/31/1981	3/31/1983
12/31/77	2/22/2009	9/5/1984	12/13/1981	6/23/1981	3/30/1985	-0.5867	-0.7397	2.1785	-0.9204	-2.9978	12/31/2008	6/30/1984	6/30/1982	3/31/1981	6/30/1984
3/31/81	5/23/2012	12/5/1987	3/13/1985	9/21/1984	6/28/1988	-13.5750	-1.7362	-2.8043	-0.9095	-3.9944	12/31/2008	6/30/1987	6/30/1984	6/30/1984	6/30/1987
6/30/82	8/22/2013	3/5/1989	6/12/1986	12/21/1985	9/27/1989	9.4229	6.2802	4.1936	-5.9033	4.0220	12/31/2015	9/30/1990	6/30/1987	6/30/1984	9/30/1990
3/31/83	5/23/2014	12/4/1989	3/13/1987	9/21/1986	6/28/1990	6.4222	3.2795	1.1929	3.0878	1.0213	12/31/2015	9/30/1990	6/30/1987	6/30/1987	9/30/1990
6/30/84	8/23/2015	3/6/1991	6/12/1988	12/22/1987	9/28/1991	1.4174	-1.7253	-3.8119	-1.9170	-3.9835	12/31/2015	9/30/1990	6/30/1987	6/30/1987	9/30/1990
6/30/87		3/5/1994	6/12/1991	12/21/1990	9/27/1994		-0.7068	-2.7934	-0.8985	-2.9650		12/31/1993	9/30/1990	9/30/1990	12/31/1993
9/30/90		6/5/1997	9/12/1994	3/23/1994	12/28/1997		11.2740	-2.7934	-0.8985	9.0159		3/31/2000	12/31/1993	12/31/1993	3/31/2000
12/31/93		9/5/2000	12/13/1997	6/23/1997	3/30/2001		-1.7362	9.1874	11.0823	-3.9944		3/31/2000	3/31/2000	3/31/2000	3/31/2000
3/31/00		12/5/2006	3/13/2004	9/22/2003	6/29/2007		3.2686	-4.7975	-2.9026	1.0104		9/30/2007	12/31/2002	12/31/2002	9/30/2007
12/31/02		9/5/2009	12/13/2006	6/23/2006	3/30/2010		-2.7219	3.1861	5.0810	-4.9800		12/31/2008	9/30/2007	9/30/2007	12/31/2008
9/30/07		6/5/2014	9/12/2011	3/23/2011	12/28/2014		6.2802	-10.7879	-8.8930	4.0220		12/31/2015	12/31/2008	12/31/2008	12/31/2015
12/31/08		9/6/2015	12/13/2012	6/23/2012	3/30/2016		1.2645	12.1881	-13.9088	-0.9937		12/31/2015	12/31/2015	12/31/2008	12/31/2015
12/31/15															
12/31/17															

Table 19: Summary of expected turning points, closest match and difference for S&P 500 Months 1950-1989

EXPECTED TURNING POINTS							DIFFERENCES IN MONTHS						CLOSEST MATCH					
Spectral Result	*0.0118283*	*0.0190121*	*0.0231171*	*0.0415897*	*0.1862915*	*0.2376043*												
No. Mo's	*84.543217*	*52.598082*	*43.258077*	*24.044444*	*5.3679314*	*4.2086786*	*84.5432*	*52.5981*	*43.2581*	*24.0444*	*5.3679*	*4.2087*	*84.54322*	*52.59808*	*43.25808*	*24.04444*	*5.367931*	*4.208679*
6/1/1951	6/17/1958	10/18/1955	1/7/1955	6/1/1953	11/11/1951	10/7/1951	-6.5145	8.4122	-17.2375	1.9761	-5.3679	-4.2087	12/1/1957	7/1/1956	8/1/1953	8/1/1953	6/1/1951	6/1/1951
10/1/1952	10/18/1959	2/17/1957	5/9/1956	10/2/1954	3/13/1953	2/6/1953	1.4362	-0.5570	1.7193	-14.0568	-3.3638	-2.2046	12/1/1959	7/1/1957	7/1/1956	8/1/1953	12/1/1952	12/1/1952
12/1/1952	12/18/1959	4/19/1957	7/9/1956	12/2/1954	5/13/1953	4/8/1953	-0.5679	2.3670	-0.2848	-16.0609	2.6156	3.7749	12/1/1959	7/1/1957	7/1/1956	8/1/1953	8/1/1953	8/1/1953
8/1/1953	8/17/1960	12/18/1957	3/9/1957	8/2/1955	1/11/1954	12/7/1953	1.4691	-0.5899	-1.2047	10.9453	-5.3679	-4.2087	10/1/1960	12/1/1957	2/1/1957	7/1/1956	8/1/1953	8/1/1953
7/1/1956	7/18/1963	11/17/1960	2/7/1960	7/2/1958	12/11/1956	11/6/1956	-13.5453	-1.5755	1.7522	-7.0260	1.6957	2.8550	6/1/1962	10/1/1960	4/1/1960	12/1/1957	2/1/1957	2/1/1957
2/1/1957	2/18/1964	6/20/1961	9/9/1960	2/2/1959	7/14/1957	6/9/1957	13.3952	5.3567	0.7009	4.8673	-0.4398	0.7195	4/1/1965	12/1/1961	10/1/1960	7/1/1959	7/1/1957	7/1/1957
7/1/1957	7/17/1964	11/17/1961	2/6/1961	7/2/1959	12/11/1957	11/6/1957	8.4670	0.4286	-4.2273	-0.0609	-0.3412	0.8180	4/1/1965	12/1/1961	10/1/1960	7/1/1959	12/1/1957	12/1/1957
12/1/1957	12/17/1964	4/19/1962	7/9/1961	12/2/1959	5/13/1958	4/8/1958	3.4404	1.3814	4.7419	-0.0609	-5.3679	-4.2087	4/1/1965	6/1/1962	12/1/1961	12/1/1959	12/1/1957	12/1/1957
7/1/1959	7/17/1966	11/17/1963	2/6/1963	7/1/1961	12/11/1959	11/6/1959	1.5020	16.4286	-8.2355	4.9987	-0.3412	0.8180	9/1/1966	4/1/1965	6/1/1962	12/1/1961	12/1/1959	12/1/1959
12/1/1959	12/17/1966	4/18/1964	7/9/1963	12/1/1961	5/12/1960	4/7/1960	-3.5247	11.4019	-13.2622	-0.0280	-1.3597	-0.2005	9/1/1966	4/1/1965	6/1/1962	12/1/1961	4/1/1960	4/1/1960
4/1/1960	4/18/1967	8/18/1964	11/8/1963	4/2/1962	9/11/1960	8/7/1960	4.4588	7.3937	16.7337	1.9432	0.6444	1.8036	9/1/1967	4/1/1965	4/1/1965	6/1/1962	10/1/1960	10/1/1960
10/1/1960	10/18/1967	2/17/1965	5/9/1964	10/2/1962	3/13/1961	2/6/1961	-1.5535	1.3814	10.7214	-4.0691	-5.3679	-4.2087	9/1/1967	4/1/1965	4/1/1965	6/1/1962	10/1/1960	10/1/1960
12/1/1961	12/17/1968	4/19/1966	7/9/1965	12/2/1963	5/13/1962	4/8/1962	-1.5206	-3.5796	-1.2704	15.9391	0.6115	1.7708	11/1/1968	1/1/1966	6/1/1965	4/1/1965	6/1/1962	6/1/1962
6/1/1962	6/17/1969	10/18/1966	1/7/1966	6/1/1964	11/11/1962	10/7/1962	0.4506	-1.5755	-0.2191	9.9597	-5.3679	-4.2087	7/1/1969	9/1/1966	1/1/1966	4/1/1965	6/1/1962	6/1/1962
4/1/1965	4/17/1972	8/18/1969	11/7/1968	4/2/1967	9/11/1965	8/7/1965	-5.5288	-1.6083	-0.2191	4.9658	-3.3638	-2.2046	11/1/1971	7/1/1969	11/1/1968	9/1/1967	6/1/1965	6/1/1965
6/1/1965	6/17/1972	10/18/1969	1/7/1969	6/2/1967	11/11/1965	10/7/1965	5.4773	-3.6125	-2.2232	2.9617	1.6629	2.8221	12/1/1972	7/1/1969	11/1/1968	9/1/1967	1/1/1966	1/1/1966
1/1/1966	1/17/1973	5/20/1970	8/9/1969	1/2/1968	6/13/1966	5/9/1966	-1.5535	0.3629	-1.3033	0.9576	2.6156	3.7749	12/1/1972	6/1/1970	7/1/1969	2/1/1968	9/1/1966	9/1/1966
9/1/1966	9/17/1973	1/18/1971	4/9/1970	9/1/1968	2/11/1967	1/7/1967	-0.5350	2.3670	1.7193	1.9761	-5.3679	-4.2087	9/1/1973	4/1/1971	6/1/1970	11/1/1968	9/1/1966	9/1/1966
9/1/1967	9/17/1974	1/18/1972	4/9/1971	9/1/1969	2/11/1968	1/7/1968	-0.5350	-2.5940	-0.2848	-2.0650	-0.3412	0.8180	9/1/1974	11/1/1971	4/1/1971	7/1/1969	2/1/1968	2/1/1968
2/1/1968	2/17/1975	6/19/1972	9/9/1971	2/1/1970	7/13/1968	6/8/1968	3.4075	5.3896	1.7193	3.9145	3.6341	-4.2087	6/1/1975	12/1/1972	11/1/1971	6/1/1970	11/1/1968	2/1/1968
11/1/1968	11/18/1975	3/20/1973	6/9/1972	11/2/1970	4/13/1969	3/9/1969	-2.5720	-3.6125	5.7275	4.9001	2.5828	3.7420	9/1/1975	12/1/1972	12/1/1972	4/1/1971	7/1/1969	7/1/1969
7/1/1969	7/17/1976	11/17/1973	2/6/1973	7/2/1971	12/11/1969	11/6/1969	4.4917	-2.5611	-2.2232	-3.0506	-5.3679	-4.2087	12/1/1976	9/1/1973	12/1/1972	4/1/1971	7/1/1969	7/1/1969
6/1/1970	6/17/1977	10/18/1974	1/7/1974	6/1/1972	11/11/1970	10/7/1970	-0.5350	-1.5755	-4.2273	5.9843	4.6197	-4.2087	6/1/1977	9/1/1974	9/1/1973	12/1/1972	4/1/1971	6/1/1970
4/1/1971	4/17/1978	8/18/1975	11/7/1974	4/1/1973	9/11/1971	8/7/1971	-2.4734	0.4286	-2.2232	-4.0034	1.6629	2.8221	2/1/1978	9/1/1975	9/1/1974	12/1/1972	11/1/1971	11/1/1971
11/1/1971	11/17/1978	3/19/1976	6/9/1975	11/1/1973	4/12/1972	3/8/1972	-1.5535	-6.6022	-0.2848	-2.0321	-5.3679	-4.2087	10/1/1978	9/1/1975	6/1/1975	9/1/1973	11/1/1971	11/1/1971
12/1/1972	12/18/1979	4/19/1977	7/9/1976	12/2/1974	5/13/1973	4/8/1973	0.4506	0.3629	4.7419	-3.0506	3.6341	-4.2087	1/1/1980	5/1/1977	12/1/1976	9/1/1974	9/1/1973	12/1/1972
9/1/1973	9/17/1980	1/18/1978	4/9/1977	9/2/1975	2/11/1974	1/7/1974	1.4691	0.4286	0.7009	-0.0609	-5.3679	-4.2087	11/1/1980	2/1/1978	5/1/1977	9/1/1975	9/1/1973	9/1/1973
9/1/1974	9/17/1981	1/18/1979	4/9/1978	9/1/1976	2/11/1975	1/7/1975	-0.5350	-3.6125	-2.2232	2.9617	3.6013	-4.2087	9/1/1981	10/1/1978	2/1/1978	12/1/1976	6/1/1975	9/1/1974
6/1/1975	6/17/1982	10/18/1979	1/7/1979	6/1/1977	11/11/1975	10/7/1975	0.4506	-0.5899	-3.2417	-0.0280	-2.3453	-1.1861	7/1/1982	10/1/1979	10/1/1978	6/1/1977	9/1/1975	9/1/1975
9/1/1975	9/17/1982	1/18/1980	4/9/1979	9/1/1977	2/11/1976	1/7/1976	-2.5720	-0.5899	5.7275	-3.0506	-5.3679	-4.2087	7/1/1982	1/1/1980	10/1/1979	6/1/1977	9/1/1975	9/1/1975
12/1/1976	12/18/1983	4/19/1981	7/9/1980	12/2/1978	5/13/1977	4/8/1977	-1.5535	4.4040	3.7563	-2.0650	-0.4069	0.7523	11/1/1983	9/1/1981	11/1/1980	10/1/1978	5/1/1977	5/1/1977
5/1/1977	5/17/1984	9/17/1981	12/7/1980	5/2/1979	10/11/1977	9/6/1977	-0.5350	-0.5570	-1.2047	4.9658	3.6998	-3.1902	5/1/1984	9/1/1981	11/1/1980	10/1/1979	2/1/1978	6/1/1977
6/1/1977	6/17/1984	10/18/1981	1/7/1981	6/2/1979	11/11/1977	10/7/1977	-1.5535	-1.5755	-2.2232	3.9473	2.6813	3.8406	5/1/1984	9/1/1981	11/1/1980	10/1/1979	2/1/1978	2/1/1978
2/1/1978	2/17/1985	6/20/1982	9/9/1981	2/2/1980	7/14/1978	6/9/1978	3.4075	0.3300	-0.2848	0.8919	0.5787	1.7379	6/1/1985	7/1/1982	9/1/1981	3/1/1980	8/1/1978	8/1/1978
8/1/1978	8/17/1985	12/18/1982	3/9/1982	8/1/1980	1/11/1979	12/7/1978	0.4835	5.3896	3.7234	2.9946	-3.3638	-2.2046	9/1/1985	6/1/1983	7/1/1982	11/1/1980	10/1/1978	10/1/1978
10/1/1978	10/17/1985	2/17/1983	5/9/1982	10/1/1980	3/13/1979	2/6/1979	-1.5206	3.3855	1.7193	0.9905	-5.3679	-4.2087	9/1/1985	6/1/1983	7/1/1982	11/1/1980	10/1/1978	10/1/1978
10/1/1979	10/17/1986	2/17/1984	5/9/1983	10/1/1981	3/12/1980	2/6/1980	-1.5206	2.3999	0.7337	-1.0136	-0.3741	0.7852	9/1/1986	5/1/1984	6/1/1983	9/1/1981	3/1/1980	3/1/1980
1/1/1980	1/17/1987	5/19/1984	8/9/1983	1/1/1982	6/12/1980	5/8/1980	-4.5432	-0.6227	-2.2889	-4.0362	-3.3967	-2.2374	9/1/1986	5/1/1984	6/1/1983	9/1/1981	3/1/1980	3/1/1980
3/1/1980	3/18/1987	7/18/1984	10/8/1983	3/2/1982	8/11/1980	7/7/1980	4.4588	-2.5940	0.7666	3.9473	2.6813	3.8406	8/1/1987	5/1/1984	11/1/1983	7/1/1982	11/1/1980	11/1/1980
11/1/1980	11/18/1987	3/20/1985	6/9/1984	11/2/1982	4/13/1981	3/9/1981	-0.5679	2.3670	-1.3033	-4.1019	4.6197	-4.2087	11/1/1987	6/1/1985	5/1/1984	7/1/1982	9/1/1981	11/1/1980
9/1/1981	9/17/1988	1/18/1986	4/9/1985	9/2/1983	2/11/1982	1/7/1982	-10.5555	-4.5981	1.7193	1.9432	4.5869	-4.2087	11/1/1987	9/1/1985	6/1/1985	11/1/1983	7/1/1982	9/1/1981
7/1/1982	7/17/1989	11/17/1986	2/6/1986	7/1/1984	12/11/1982	11/6/1982	4.4917	-2.5611	-5.2129	-2.0321	-5.3679	-4.2087	12/1/1989	9/1/1986	9/1/1985	5/1/1984	7/1/1982	7/1/1982
6/1/1983	6/17/1990	10/18/1987	1/7/1987	6/1/1985	11/11/1983	10/7/1983	-1.5535	0.4286	-4.2273	-0.0280	-0.3412	0.8180	5/1/1990	11/1/1987	9/1/1986	6/1/1985	11/1/1983	11/1/1983
11/1/1983	11/17/1990	3/19/1988	6/9/1987	11/1/1985	4/12/1984	3/8/1984	-1.5535	-4.5981	1.7193	-2.0321	0.6115	1.7708	10/1/1990	11/1/1987	8/1/1987	9/1/1985	5/1/1984	5/1/1984
5/1/1984	5/18/1991	9/17/1988	12/8/1987	5/2/1986	10/11/1984	9/6/1984	5.4773	-10.5775	-1.2375	2.9617	-5.3679	-4.2087	11/1/1991	11/1/1987	11/1/1987	8/1/1986	5/1/1984	5/1/1984
6/1/1985	6/17/1992	10/18/1989	1/7/1989	6/2/1987	11/11/1985	10/7/1985	-6.5473	1.4142	10.7542	1.9432	-2.3453	-1.1861	12/1/1991	12/1/1989	12/1/1989	8/1/1987	9/1/1985	9/1/1985
9/1/1985	9/17/1992	1/18/1990	4/9/1989	9/2/1987	2/11/1986	1/7/1986	5.4116	-0.5899	7.7317	-1.0794	-5.3679	-4.2087	3/1/1993	1/1/1990	12/1/1989	8/1/1987	9/1/1985	9/1/1985
8/1/1986	8/17/1993	12/18/1990	3/9/1990	8/1/1988	1/11/1987	12/7/1986	4.4917	-2.5940	1.7193	-9.0301	-4.3495	-3.1902	1/1/1994	10/1/1990	5/1/1990	11/1/1987	9/1/1986	9/1/1986
9/1/1986	9/17/1993	1/18/1991	4/9/1990	9/1/1988	2/11/1987	1/7/1987	3.4732	-3.6125	0.7009	-10.0486	-5.3679	-4.2087	1/1/1994	10/1/1990	5/1/1990	11/1/1987	9/1/1986	9/1/1986
8/1/1987	8/17/1994	12/18/1991	3/9/1991	8/1/1989	1/11/1988	12/7/1987	-0.5350	-0.5899	-5.2458	3.9802	-2.3453	-1.1861	8/1/1994	12/1/1991	10/1/1990	12/1/1989	11/1/1987	11/1/1987
11/1/1987	11/17/1994	3/19/1992	6/9/1991	11/1/1989	4/12/1988	3/8/1988	-0.5350	-3.6125	4.7419	0.9576	-5.3679	-4.2087	11/1/1994	12/1/1991	11/1/1991	12/1/1989	11/1/1987	11/1/1987
12/1/1989	12/17/1996	4/19/1994	7/9/1993	12/2/1991	5/13/1990	4/8/1990	-5.5617	1.3814	-4.2930	-0.0609	-0.4069	0.7523	7/1/1996	6/1/1994	3/1/1993	12/1/1991	5/1/1990	5/1/1990

Table 20: Summary of expected turning points, closest match and difference for S&P 500 Months 1990-2018

EXPECTED TURNING POINTS							DIFFERENCES IN MONTHS						CLOSEST MATCH					
Spectral Result	*0.0118283*	*0.0190121*	*0.0231171*	*0.0415897*	*0.1862915*	*0.2376043*												
No. Mo's	*84.543217*	*52.598082*	*43.258077*	*24.044444*	*5.3679314*	*4.2086786*	*84.5432*	*52.5981*	*43.2581*	*24.0444*	*5.3679*	*4.2087*	*84.54322*	*52.59808*	*43.25808*	*24.04444*	*5.367931*	*4.208679*
1/1/1990	1/17/1997	5/20/1994	8/9/1993	1/2/1992	6/13/1990	5/9/1990	-6.5802	0.3629	4.7419	-1.0794	-1.4254	-0.2662	7/1/1996	6/1/1994	1/1/1994	12/1/1991	5/1/1990	5/1/1990
5/1/1990	5/17/1997	9/17/1994	12/7/1993	5/1/1992	10/11/1990	9/6/1990	-10.5227	1.4471	0.7994	-5.0219	-0.3412	0.8180	7/1/1996	11/1/1994	1/1/1994	12/1/1991	10/1/1990	10/1/1990
10/1/1990	10/17/1997	2/17/1995	5/9/1994	10/1/1992	3/13/1991	2/6/1991	7.4486	-3.5796	0.7337	4.9330	-5.3679	-4.2087	6/1/1998	11/1/1994	6/1/1994	3/1/1993	10/1/1990	10/1/1990
11/1/1991	11/17/1998	3/19/1996	6/9/1995	11/1/1993	4/12/1992	3/8/1992	-3.5576	3.3855	-7.2499	1.9761	-4.3823	-3.2231	8/1/1998	7/1/1996	11/1/1994	1/1/1994	12/1/1991	12/1/1991
12/1/1991	12/17/1998	4/18/1996	7/9/1995	12/1/1993	5/12/1992	4/7/1992	-4.5432	2.3999	-8.2355	0.9905	-5.3679	-4.2087	8/1/1998	7/1/1996	11/1/1994	1/1/1994	12/1/1991	12/1/1991
3/1/1993	3/17/2000	7/18/1997	10/7/1996	3/2/1995	8/11/1993	7/7/1993	-0.5350	10.4163	-3.2417	-4.0034	4.6855	-4.2087	3/1/2000	6/1/1998	7/1/1996	11/1/1994	1/1/1994	3/1/1993
1/1/1994	1/17/2001	5/20/1998	8/9/1997	1/2/1996	6/13/1994	5/9/1994	1.4034	0.3629	9.7029	5.9186	-0.4069	0.7523	3/1/2001	6/1/1998	6/1/1998	7/1/1996	6/1/1994	6/1/1994
6/1/1994	6/17/2001	10/18/1998	1/7/1998	6/1/1996	11/11/1994	10/7/1994	2.4876	-2.5940	4.7419	0.9576	-0.3412	0.8180	9/1/2001	8/1/1998	6/1/1998	7/1/1996	11/1/1994	11/1/1994
8/1/1994	8/17/2001	12/18/1998	3/9/1998	8/1/1996	1/11/1995	12/7/1994	0.4835	-4.5981	2.7378	-1.0465	-2.3453	-1.1861	9/1/2001	8/1/1998	6/1/1998	7/1/1996	11/1/1994	11/1/1994
11/1/1994	11/17/2001	3/20/1999	6/9/1998	11/1/1996	4/13/1995	3/9/1995	0.4506	2.3670	-0.2848	-4.0691	-5.3679	-4.2087	12/1/2001	6/1/1999	6/1/1998	7/1/1996	11/1/1994	11/1/1994
7/1/1996	7/18/2003	11/17/2000	2/7/2000	7/2/1998	12/11/1996	11/6/1996	-5.4960	3.3855	0.7337	0.9576	-5.3679	-4.2087	2/1/2003	3/1/2001	3/1/2000	8/1/1998	7/1/1996	7/1/1996
6/1/1998	6/17/2005	10/18/2002	1/7/2002	6/1/2000	11/11/1998	10/7/1998	-2.5391	0.4286	-1.2375	1.9761	-3.3638	-2.2046	4/1/2005	11/1/2002	12/1/2001	8/1/2000	8/1/1998	8/1/1998
8/1/1998	8/17/2005	12/18/2002	3/9/2002	8/1/2000	1/11/1999	12/7/1998	-4.5432	1.4471	-3.2417	-0.0280	4.6197	-4.2087	4/1/2005	2/1/2003	12/1/2001	8/1/2000	6/1/1999	8/1/1998
6/1/1999	6/17/2006	10/18/2003	1/7/2003	6/1/2001	11/11/1999	10/7/1999	-1.5535	3.4512	0.7994	2.9946	-2.3453	-1.1861	5/1/2006	2/1/2004	2/1/2003	9/1/2001	9/1/1999	9/1/1999
9/1/1999	9/17/2006	1/18/2004	4/9/2003	9/1/2001	2/11/2000	1/7/2000	-4.5761	0.4286	-2.2232	-0.0280	0.6115	1.7708	5/1/2006	2/1/2004	2/1/2003	9/1/2001	3/1/2000	3/1/2000
3/1/2000	3/18/2007	7/18/2004	10/8/2003	3/2/2002	8/11/2000	7/7/2000	1.4362	-0.5899	3.7892	-3.0177	-0.3412	0.8180	5/1/2007	7/1/2004	2/1/2004	12/1/2001	8/1/2000	8/1/2000
8/1/2000	8/18/2007	12/18/2004	3/9/2004	8/2/2002	1/11/2001	12/7/2000	1.4362	-0.5899	-1.2375	0.9576	1.5972	2.7564	10/1/2007	12/1/2004	2/1/2004	9/1/2002	3/1/2001	3/1/2001
3/1/2001	3/17/2008	7/18/2005	10/7/2004	3/2/2003	8/11/2001	7/7/2001	1.4691	-3.5796	1.7850	-0.9808	0.6772	1.8365	5/1/2008	4/1/2005	12/1/2004	2/1/2003	9/1/2001	9/1/2001
9/1/2001	9/17/2008	1/18/2006	4/9/2005	9/2/2003	2/11/2002	1/7/2002	4.4917	2.3670	-0.2848	4.9658	-2.3782	-1.2189	2/1/2009	4/1/2006	4/1/2005	2/1/2004	12/1/2001	12/1/2001
12/1/2001	12/17/2008	4/19/2006	7/9/2005	12/2/2003	5/13/2002	4/8/2002	1.5020	0.3629	-3.2745	1.9761	3.6341	-4.2087	2/1/2009	5/1/2006	4/1/2005	2/1/2004	9/1/2002	12/1/2001
9/1/2002	9/17/2009	1/18/2007	4/9/2006	9/1/2004	2/11/2003	1/7/2003	6.4301	3.3526	-0.2848	-2.0650	-0.3412	0.8180	4/1/2010	5/1/2007	4/1/2006	7/1/2004	2/1/2003	2/1/2003
11/1/2002	11/17/2009	3/20/2007	6/9/2006	11/1/2004	4/13/2003	3/9/2003	4.4260	1.3485	-1.3033	0.9576	-2.3453	-1.1861	4/1/2010	5/1/2007	5/1/2006	12/1/2004	2/1/2003	2/1/2003
2/1/2003	2/17/2010	6/20/2007	9/9/2006	2/1/2005	7/14/2003	6/9/2003	1.4034	-1.6741	-4.3258	1.9104	-5.3679	-4.2087	4/1/2010	5/1/2007	5/1/2006	4/1/2005	2/1/2003	2/1/2003
2/1/2004	2/17/2011	6/19/2008	9/9/2007	2/1/2006	7/13/2004	6/8/2004	1.4034	-1.6412	0.7009	1.9104	-0.4069	0.7523	4/1/2011	5/1/2008	10/1/2007	4/1/2006	7/1/2004	7/1/2004
7/1/2004	7/18/2011	11/17/2008	2/7/2008	7/2/2006	12/11/2004	11/6/2004	1.4691	2.4656	2.7378	-2.0650	-0.3412	0.8180	9/1/2011	2/1/2009	5/1/2008	5/1/2006	12/1/2004	12/1/2004
12/1/2004	12/18/2011	4/19/2009	7/9/2008	12/2/2006	5/13/2005	4/8/2005	2.4219	-2.5611	-2.2889	4.9001	-1.3926	-0.2333	3/1/2012	2/1/2009	5/1/2008	5/1/2007	4/1/2005	4/1/2005
4/1/2005	4/17/2012	8/18/2009	11/7/2008	4/2/2007	9/11/2005	8/7/2005	0.4506	-6.5365	2.8035	0.9248	-5.3679	-4.2087	5/1/2012	2/1/2009	2/1/2009	5/1/2007	4/1/2005	4/1/2005
4/1/2006	4/17/2013	8/18/2010	11/7/2009	4/1/2008	9/11/2006	8/7/2006	-11.5412	-2.5940	4.7419	0.9576	-4.3823	-3.2231	5/1/2012	6/1/2010	4/1/2010	5/1/2008	5/1/2006	5/1/2006
5/1/2006	5/17/2013	9/17/2010	12/7/2009	5/1/2008	10/11/2006	9/6/2006	-12.5268	-3.5796	3.7563	-0.0280	-5.3679	-4.2087	5/1/2012	6/1/2010	4/1/2010	5/1/2008	5/1/2006	5/1/2006
5/1/2007	5/17/2014	9/17/2011	12/7/2010	5/1/2009	10/11/2007	9/6/2007	11.4568	-0.5570	3.7563	-2.9520	-0.3412	0.8180	5/1/2015	9/1/2011	4/1/2011	2/1/2009	10/1/2007	10/1/2007
10/1/2007	10/17/2014	2/17/2012	5/9/2011	10/1/2009	3/12/2008	2/6/2008	6.4301	0.3958	-1.2704	5.9514	1.6300	2.7893	5/1/2015	3/1/2012	4/1/2011	4/1/2010	5/1/2008	5/1/2008
5/1/2008	5/18/2015	9/17/2012	12/8/2011	5/2/2010	10/11/2008	9/6/2008	-0.5679	-4.5981	2.7378	0.9576	3.6998	-4.2087	5/1/2015	5/1/2012	3/1/2012	6/1/2010	2/1/2009	5/1/2008
2/1/2009	2/18/2016	6/20/2013	9/9/2012	2/2/2011	7/14/2009	6/9/2009	-0.5679	-13.6658	-4.3258	1.8775	-5.3679	-4.2087	2/1/2016	5/1/2012	5/1/2012	4/1/2011	2/1/2009	2/1/2009
4/1/2010	4/17/2017	8/18/2014	11/7/2013	4/1/2012	9/11/2010	8/7/2010	8.4999	8.3793	17.7193	0.9576	-3.3638	-2.2046	1/1/2018	5/1/2015	5/1/2015	5/1/2012	6/1/2010	6/1/2010
6/1/2010	6/17/2017	10/18/2014	1/7/2014	6/1/2012	11/11/2010	10/7/2010	6.4958	6.3752	15.7152	-1.0465	4.6197	-4.2087	1/1/2018	5/1/2015	5/1/2015	5/1/2012	4/1/2011	6/1/2010
4/1/2011	4/17/2018	8/18/2015	11/7/2014	4/1/2013	9/11/2011	8/7/2011	1.4691	0.4286	5.7275	-11.0342	-0.3412	0.8180	6/1/2018	9/1/2015	5/1/2015	5/1/2012	9/1/2011	9/1/2011
9/1/2011		1/18/2016	4/9/2015	9/1/2013	2/11/2012	1/7/2012		0.4286	0.7009	-16.0609	0.6115	1.7708		2/1/2016	5/1/2015	5/1/2012	3/1/2012	3/1/2012
3/1/2012		7/18/2016	10/8/2015	3/2/2014	8/11/2012	7/7/2012		-5.5509	-1.2375	13.9350	-3.3638	-2.2046		2/1/2016	9/1/2015	5/1/2015	5/1/2012	5/1/2012
5/1/2012		9/17/2016	12/8/2015	5/2/2014	10/11/2012	9/6/2012		-7.5550	1.7850	11.9309	-5.3679	-4.2087		2/1/2016	2/1/2016	5/1/2015	5/1/2012	5/1/2012
5/1/2015				5/1/2017	10/11/2015	9/6/2015				8.0213	-1.3269	-0.1676				1/1/2018	9/1/2015	9/1/2015
9/1/2015				9/1/2017	2/11/2016	1/7/2016				3.9802	-0.3412	0.8180				1/1/2018	2/1/2016	2/1/2016
2/1/2016				2/1/2018	7/13/2016	6/8/2016				-1.0465	-5.3679	-4.2087				1/1/2018	2/1/2016	2/1/2016
1/1/2018					6/13/2018	5/9/2018					-0.4069	0.7523					6/1/2018	6/1/2018
6/1/2018																		

Table 21: Summary of expected turning points, closest match and difference for S&P 500 Weeks 1950-1977

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
5/1/1950	9/21/1957	9/16/1953	4/16/1952	6/16/1954	-2.9483	6.5121	-2.1510	15.2398	9/1/1957	11/1/1953	4/1/1952	10/1/1954
6/1/1950	10/22/1957	10/17/1953	5/17/1952	7/17/1954	-7.3769	2.0835	-6.5796	10.8112	9/1/1957	11/1/1953	4/1/1952	10/1/1954
10/1/1950	2/21/1958	2/16/1954	9/16/1952	11/16/1954	1.0517	-6.6308	-24.0081	-6.6173	3/1/1958	1/1/1954	4/1/1952	10/1/1954
11/1/1951	3/24/1959	3/19/1955	10/17/1953	12/17/1955	5.3374	6.0835	2.1347	2.0970	5/1/1959	5/1/1955	11/1/1953	1/1/1956
4/1/1952	8/23/1959	8/18/1955	3/18/1954	5/17/1956	1.1946	6.2264	-10.8653	2.0970	9/1/1959	10/1/1955	1/1/1954	6/1/1956
4/1/1953	8/22/1960	8/17/1956	3/18/1955	5/17/1957	31.6231	-11.0594	6.2776	15.2398	4/1/1961	6/1/1956	5/1/1955	9/1/1957
11/1/1953	3/24/1961	3/19/1957	10/18/1955	12/17/1957	1.0517	23.6549	-2.4367	10.5255	4/1/1961	9/1/1957	10/1/1955	3/1/1958
1/1/1954	5/24/1961	5/19/1957	12/18/1955	2/16/1958	-7.6626	14.9406	1.9919	1.8112	4/1/1961	9/1/1957	1/1/1956	3/1/1958
10/1/1954	2/21/1962	2/16/1958	9/16/1956	11/16/1958	1.0517	1.7978	-15.2938	2.0970	3/1/1962	3/1/1958	6/1/1956	12/1/1958
5/1/1955	9/21/1962	9/16/1958	4/16/1957	6/16/1959	14.4803	10.7978	19.7062	-6.6173	1/1/1963	12/1/1958	9/1/1957	5/1/1959
10/1/1955	2/21/1963	2/16/1959	9/16/1957	11/16/1959	-7.3769	10.5121	-2.1510	2.0970	1/1/1963	5/1/1959	9/1/1957	12/1/1959
1/1/1956	5/24/1963	5/19/1959	12/17/1957	2/16/1960	1.0517	-2.6308	10.5633	-11.0459	6/1/1963	5/1/1959	3/1/1958	12/1/1959
4/1/1956	8/23/1963	8/18/1959	3/18/1958	5/17/1960	-3.2340	1.9406	-2.4367	-24.0459	8/1/1963	9/1/1959	3/1/1958	12/1/1959
6/1/1956	10/23/1963	10/18/1959	5/18/1958	7/17/1960	-11.9483	6.2264	-11.1510	-32.7602	8/1/1963	12/1/1959	3/1/1958	12/1/1959
9/1/1957	1/22/1965	1/17/1961	8/18/1959	10/17/1961	-7.5197	10.5121	1.9919	19.2398	12/1/1964	4/1/1961	9/1/1959	3/1/1962
3/1/1958	7/22/1965	7/17/1961	2/15/1960	4/16/1962	1.3374	-15.3451	-10.8653	-6.6173	8/1/1965	4/1/1961	12/1/1959	3/1/1962
12/1/1958	4/23/1966	4/18/1962	11/16/1960	1/16/1963	-11.6626	-6.9165	19.4204	-2.1888	2/1/1966	3/1/1962	4/1/1961	1/1/1963
5/1/1959	9/21/1966	9/16/1962	4/16/1961	6/16/1963	-33.2340	15.2264	-2.1510	-2.1888	2/1/1966	1/1/1963	4/1/1961	6/1/1963
9/1/1959	1/22/1967	1/17/1963	8/17/1961	10/17/1963	-50.8054	-2.3451	-19.7224	-11.0459	2/1/1966	1/1/1963	4/1/1961	8/1/1963
12/1/1959	4/23/1967	4/18/1963	11/16/1961	1/16/1964	-63.8054	6.2264	14.9919	15.0970	2/1/1966	6/1/1963	3/1/1962	5/1/1964
4/1/1961	8/22/1968	8/17/1964	3/18/1963	5/17/1965	31.6231	2.0835	10.7062	10.8112	4/1/1969	9/1/1964	6/1/1963	8/1/1965
3/1/1962	7/22/1969	7/17/1965	2/15/1964	4/16/1966	-16.0912	2.0835	10.8490	-10.6173	4/1/1969	8/1/1965	5/1/1964	2/1/1966
1/1/1963	5/24/1970	5/19/1966	12/17/1964	2/16/1967	27.1946	-15.3451	-2.2938	-54.3316	12/1/1970	2/1/1966	12/1/1964	2/1/1966
6/1/1963	10/22/1970	10/17/1966	5/17/1965	7/17/1967	5.6231	-36.9165	10.8490	-75.9030	12/1/1970	2/1/1966	8/1/1965	2/1/1966
8/1/1963	12/22/1970	12/17/1966	7/17/1965	9/16/1967	-3.0912	-45.6308	2.1347	80.3827	12/1/1970	2/1/1966	8/1/1965	4/1/1969
5/1/1964	9/22/1971	9/17/1967	4/17/1966	6/16/1968	5.6231	80.2264	-10.7224	41.2398	11/1/1971	4/1/1969	2/1/1966	4/1/1969
9/1/1964	1/23/1972	1/18/1968	8/18/1966	10/17/1968	-11.9483	62.6549	-28.2938	23.6684	11/1/1971	4/1/1969	2/1/1966	4/1/1969
12/1/1964	4/23/1972	4/18/1968	11/17/1966	1/16/1969	5.4803	49.6549	-41.2938	10.6684	6/1/1972	4/1/1969	2/1/1966	4/1/1969
8/1/1965	12/22/1972	12/17/1968	7/18/1967	9/16/1969	1.3374	14.9406	-76.0081	-24.0459	1/1/1973	4/1/1969	2/1/1966	4/1/1969
2/1/1966	6/24/1973	6/19/1969	1/18/1968	3/19/1970	-12.0912	-11.3451	62.7062	36.6684	4/1/1973	4/1/1969	4/1/1969	12/1/1970
4/1/1969	8/22/1976	8/17/1972	3/18/1971	5/17/1973	-20.5197	-6.7736	-15.2938	-6.6173	4/1/1976	7/1/1972	12/1/1970	4/1/1973
12/1/1970	4/23/1978	4/18/1974	11/16/1972	1/16/1975	14.1946	6.2264	6.5633	2.2398	8/1/1978	6/1/1974	1/1/1973	2/1/1975
11/1/1971	3/24/1979	3/19/1975	10/17/1973	12/17/1975	1.0517	-6.6308	19.2776	-11.0459	4/1/1979	2/1/1975	3/1/1974	10/1/1975
6/1/1972	10/23/1979	10/18/1975	5/18/1974	7/17/1976	9.9088	-2.4879	1.9919	-15.3316	1/1/1980	10/1/1975	6/1/1974	4/1/1976
7/1/1972	11/22/1979	11/17/1975	6/17/1974	8/16/1976	5.6231	-6.7736	-2.2938	-19.6173	1/1/1980	10/1/1975	6/1/1974	4/1/1976
1/1/1973	5/24/1980	5/19/1976	12/18/1974	2/16/1977	-16.2340	-6.9165	6.4204	1.8112	2/1/1980	4/1/1976	2/1/1975	3/1/1977
4/1/1973	8/22/1980	8/17/1976	3/18/1975	5/17/1977	10.0517	-19.7736	-6.4367	-11.0459	11/1/1980	4/1/1976	2/1/1975	3/1/1977
3/1/1974	7/22/1981	7/17/1977	2/15/1976	4/16/1978	-37.6626	10.7978	6.5633	15.2398	11/1/1980	10/1/1977	4/1/1976	8/1/1978
6/1/1974	10/22/1981	10/17/1977	5/17/1976	7/17/1978	31.6231	-2.3451	-6.5796	2.0970	6/1/1982	10/1/1977	4/1/1976	8/1/1978
11/1/1974	3/24/1982	3/19/1978	10/17/1976	12/17/1978	9.7660	19.2264	19.2776	14.9541	6/1/1982	8/1/1978	3/1/1977	4/1/1979
2/1/1975	6/24/1982	6/19/1978	1/17/1977	3/19/1979	-3.3769	6.0835	6.1347	1.8112	6/1/1982	8/1/1978	3/1/1977	4/1/1979
10/1/1975	2/21/1983	2/16/1979	9/16/1977	11/16/1979	-24.8054	6.2264	2.1347	6.5255	9/1/1982	4/1/1979	10/1/1977	1/1/1980
4/1/1976	8/23/1983	8/18/1979	3/18/1978	5/17/1980	23.0517	19.3692	19.4204	-15.1888	2/1/1984	1/1/1980	8/1/1978	2/1/1980
3/1/1977	7/22/1984	7/17/1980	2/15/1979	4/16/1981	1.3374	15.2264	6.4204	-23.7602	8/1/1984	11/1/1980	4/1/1979	11/1/1980
10/1/1977	2/21/1985	2/16/1981	9/17/1979	11/16/1981	14.1946	-15.3451	15.1347	28.0970	6/1/1985	11/1/1980	1/1/1980	6/1/1982

Table 22: Summary of expected turning points, closest match and difference for S&P 500 Weeks 1978-2009

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
8/1/1978	12/22/1985	12/17/1981	7/17/1980	9/16/1982	-7.3769	23.6549	15.2776	-2.1888	11/1/1985	6/1/1982	11/1/1980	9/1/1982
4/1/1979	8/22/1986	8/17/1982	3/17/1981	5/17/1983	35.9088	2.0835	-19.4367	-36.9030	5/1/1987	9/1/1982	11/1/1980	9/1/1982
1/1/1980	5/24/1987	5/19/1983	12/17/1981	2/16/1984	-3.3769	36.7978	23.7062	-2.1888	5/1/1987	2/1/1984	6/1/1982	2/1/1984
2/1/1980	6/24/1987	6/19/1983	1/17/1982	3/18/1984	-7.8054	32.3692	19.2776	6.2398	5/1/1987	2/1/1984	6/1/1982	5/1/1984
11/1/1980	3/24/1988	3/19/1984	10/18/1982	12/17/1984	-46.9483	6.0835	-6.7224	-19.7602	5/1/1987	5/1/1984	9/1/1982	8/1/1984
6/1/1982	10/22/1989	10/17/1985	5/17/1984	7/17/1986	5.6231	2.0835	-2.2938	-36.9030	12/1/1989	11/1/1985	5/1/1984	11/1/1985
9/1/1982	1/22/1990	1/17/1986	8/17/1984	10/17/1986	-7.5197	-11.0594	-2.2938	27.9541	12/1/1989	11/1/1985	8/1/1984	5/1/1987
2/1/1984	6/24/1991	6/19/1987	1/17/1986	3/18/1988	5.3374	-7.0594	-11.0081	-46.0459	8/1/1991	5/1/1987	11/1/1985	5/1/1987
5/1/1984	9/22/1991	9/17/1987	4/17/1986	6/16/1988	-7.5197	-19.9165	-23.8653	45.5255	8/1/1991	5/1/1987	11/1/1985	5/1/1989
8/1/1984	12/23/1991	12/18/1987	7/18/1986	9/16/1988	9.7660	-33.0594	-37.0081	32.3827	3/1/1992	5/1/1987	11/1/1985	5/1/1989
6/1/1985	10/22/1992	10/17/1988	5/18/1987	7/17/1989	-11.8054	27.9406	-2.4367	-2.3316	8/1/1992	5/1/1989	5/1/1987	7/1/1989
11/1/1985	3/24/1993	3/19/1989	10/18/1987	12/17/1989	9.7660	6.0835	-24.2938	-2.3316	6/1/1993	5/1/1989	5/1/1987	12/1/1989
5/1/1987	9/21/1994	9/16/1990	4/16/1989	6/16/1991	-2.9483	6.5121	2.1347	6.5255	9/1/1994	11/1/1990	5/1/1989	8/1/1991
5/1/1989	9/21/1996	9/16/1992	4/17/1991	6/16/1993	14.4803	-6.6308	-10.7224	-2.1888	1/1/1997	8/1/1992	2/1/1991	6/1/1993
7/1/1989	11/21/1996	11/16/1992	6/17/1991	8/16/1993	5.7660	-15.3451	6.4204	-10.9030	1/1/1997	8/1/1992	8/1/1991	6/1/1993
12/1/1989	4/23/1997	4/18/1993	11/17/1991	1/16/1994	-16.0912	6.2264	14.9919	10.6684	1/1/1997	6/1/1993	3/1/1992	4/1/1994
11/1/1990	3/24/1998	3/19/1994	10/17/1992	12/17/1994	61.9088	1.7978	-11.0081	-6.6173	6/1/1999	4/1/1994	8/1/1992	11/1/1994
2/1/1991	6/24/1998	6/19/1994	1/17/1993	3/19/1995	48.7660	10.5121	19.2776	6.0970	6/1/1999	9/1/1994	6/1/1993	5/1/1995
8/1/1991	12/22/1998	12/17/1994	7/17/1993	9/16/1995	22.9088	-6.6308	-6.5796	6.5255	6/1/1999	11/1/1994	6/1/1993	11/1/1995
3/1/1992	7/23/1999	7/18/1995	2/15/1994	4/16/1996	-7.5197	-11.2022	6.4204	-2.1888	6/1/1999	5/1/1995	4/1/1994	4/1/1996
8/1/1992	12/23/1999	12/18/1995	7/18/1994	9/16/1996	-3.2340	-6.7736	6.4204	15.2398	12/1/1999	11/1/1995	9/1/1994	1/1/1997
6/1/1993	10/22/2000	10/17/1996	5/18/1995	7/17/1997	5.6231	10.7978	-2.4367	-28.1888	12/1/2000	1/1/1997	5/1/1995	1/1/1997
4/1/1994	8/22/2001	8/17/1997	3/17/1996	5/17/1998	10.0517	-32.6308	2.1347	54.2398	11/1/2001	1/1/1997	4/1/1996	6/1/1999
9/1/1994	1/22/2002	1/17/1998	8/17/1996	10/17/1998	-11.8054	-54.4879	19.5633	32.3827	11/1/2001	1/1/1997	1/1/1997	6/1/1999
11/1/1994	3/24/2002	3/19/1998	10/17/1996	12/17/1998	9.7660	62.6549	10.8490	23.6684	6/1/2002	6/1/1999	1/1/1997	6/1/1999
5/1/1995	9/21/2002	9/16/1998	4/16/1997	6/16/1999	14.4803	36.7978	-15.0081	-2.1888	1/1/2003	6/1/1999	1/1/1997	6/1/1999
11/1/1995	3/24/2003	3/19/1999	10/17/1997	12/17/1999	-11.8054	10.5121	-41.2938	-2.3316	1/1/2003	6/1/1999	1/1/1997	12/1/1999
4/1/1996	8/23/2003	8/18/1999	3/18/1998	5/17/2000	27.1946	-11.2022	62.8490	6.3827	3/1/2004	6/1/1999	6/1/1999	7/1/2000
1/1/1997	5/24/2004	5/19/2000	12/18/1998	2/16/2001	-12.0912	6.0835	23.5633	-11.0459	3/1/2004	7/1/2000	6/1/1999	12/1/2000
6/1/1999	10/22/2006	10/17/2002	5/17/2001	7/17/2003	10.0517	10.7978	-23.8653	-28.1888	1/1/2007	1/1/2003	12/1/2000	1/1/2003
12/1/1999	4/23/2007	4/18/2003	11/16/2001	1/16/2004	-7.6626	-15.3451	-2.1510	6.3827	3/1/2007	1/1/2003	11/1/2001	3/1/2004
7/1/2000	11/22/2007	11/17/2003	6/17/2002	8/16/2004	18.6231	14.9406	-2.2938	15.2398	4/1/2008	3/1/2004	6/1/2002	12/1/2004
12/1/2000	4/23/2008	4/18/2004	11/17/2002	1/16/2005	-3.2340	-6.9165	6.4204	-6.6173	4/1/2008	3/1/2004	1/1/2003	12/1/2004
11/1/2001	3/24/2009	3/19/2005	10/18/2003	12/17/2005	-20.5197	-15.4879	19.2776	-15.3316	11/1/2008	12/1/2004	3/1/2004	9/1/2005
6/1/2002	10/22/2009	10/17/2005	5/17/2004	7/17/2006	-7.3769	-6.6308	-11.0081	23.9541	9/1/2009	9/1/2005	3/1/2004	1/1/2007
1/1/2003	5/24/2010	5/19/2006	12/17/2004	2/16/2007	-3.3769	32.3692	-2.2938	1.8112	5/1/2010	1/1/2007	12/1/2004	3/1/2007
3/1/2004	7/23/2011	7/18/2007	2/15/2006	4/16/2008	44.7660	-19.9165	-23.8653	-2.1888	6/1/2012	3/1/2007	9/1/2005	4/1/2008
12/1/2004	4/23/2012	4/18/2008	11/17/2006	1/16/2009	5.4803	-2.4879	6.4204	-10.9030	6/1/2012	4/1/2008	1/1/2007	11/1/2008
9/1/2005	1/22/2013	1/17/2009	8/18/2007	10/17/2009	5.3374	-11.0594	-24.2938	-6.6173	3/1/2013	11/1/2008	3/1/2007	9/1/2009
1/1/2007	5/24/2014	5/19/2010	12/17/2008	2/16/2011	14.1946	-2.6308	-6.5796	-41.6173	9/1/2014	5/1/2010	11/1/2008	5/1/2010
3/1/2007	7/22/2014	7/17/2010	2/14/2009	4/16/2011	5.7660	-11.0594	-15.0081	-50.0459	9/1/2014	5/1/2010	11/1/2008	5/1/2010
4/1/2008	8/23/2015	8/18/2011	3/18/2010	5/17/2012	1.1946	41.0835	6.2776	2.0970	9/1/2015	6/1/2012	5/1/2010	6/1/2012
11/1/2008	3/24/2016	3/19/2012	10/18/2010	12/17/2012	-3.3769	10.5121	-24.2938	10.5255	3/1/2016	6/1/2012	5/1/2010	3/1/2013
9/1/2009	1/22/2017	1/17/2013	8/18/2011	10/17/2013	9.7660	6.0835	41.1347	-19.7602	4/1/2017	3/1/2013	6/1/2012	6/1/2013

Table 23: Summary of expected turning points, closest match and difference for S&P 500 Weeks 2010-2018

	EXPECTED TURNING POINTS				DIFFERENCES IN WEEKS				CLOSEST MATCH			
Spectral Result	*0.00259198*	*0.0056707*	*0.00977576*	*0.004644*								
No. Wk's	*385.805446*	*176.345072*	*102.293838*	*215.331611*	*385.8054*	*176.3451*	*102.2938*	*215.3316*	*385.805446*	*176.345072*	*102.293838*	*215.331611*
1/1/2010	5/24/2017	5/19/2013	12/18/2011	2/16/2014	-7.6626	1.7978	23.7062	28.0970	4/1/2017	6/1/2013	6/1/2012	9/1/2014
5/1/2010	9/21/2017	9/16/2013	4/16/2012	6/16/2014	-24.8054	-15.3451	6.5633	10.9541	4/1/2017	6/1/2013	6/1/2012	9/1/2014
6/1/2012		10/18/2015	5/18/2014	7/17/2016		-6.7736	15.1347	10.8112		9/1/2015	9/1/2014	10/1/2016
9/1/2012		1/18/2016	8/18/2014	10/17/2016		6.0835	1.9919	-2.3316		3/1/2016	9/1/2014	10/1/2016
3/1/2013		7/17/2016	2/15/2015	4/16/2017		10.7978	-10.8653	-2.1888		10/1/2016	12/1/2014	4/1/2017
6/1/2013		10/17/2016	5/18/2015	7/17/2017		-2.3451	6.2776	-15.3316		10/1/2016	7/1/2015	4/1/2017
9/1/2014		1/17/2018	8/17/2016			-41.6308	6.4204			4/1/2017	10/1/2016	
12/1/2014		4/18/2018	11/16/2016			-54.6308	-6.5796			4/1/2017	10/1/2016	
7/1/2015			6/16/2017				-10.8653			5/1/1950	4/1/2017	
9/1/2015			8/17/2017				-19.7224			5/1/1950	4/1/2017	
3/1/2016			2/15/2018				-45.7224			5/1/1950	4/1/2017	
10/1/2016												
4/1/2017												

Table 24: Summary of expected turning points, closest match and difference for S&P 500 Days 1950-1969

	EXPECTED TURNING POINTS						DIFFERENCES IN DAYS						CLOSEST MATCH					
Spectral Result	*0.00116019*	*0.00158149*	*0.00196067*	*0.00265853*	*0.00319218*	*0.00360268*												
No. Day's	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*	*861.9244*	*632.3168*	*510.0289*	*376.1483*	*313.2657*	*277.5711*	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*
6/12/1950	10/20/1952	3/5/1952	11/4/1951	6/23/1951	4/21/1951	3/16/1951	1.0756	-43.3168	18.9711	5.8517	11.7343	47.4289	10/22/1952	1/22/1952	11/23/1951	6/29/1951	5/3/1951	5/3/1951
7/17/1950	11/24/1952	4/9/1952	12/9/1951	7/28/1951	5/26/1951	4/20/1951	-33.9244	-78.3168	-16.0289	-29.1483	-23.2657	12.4289	10/22/1952	1/22/1952	11/23/1951	6/29/1951	5/3/1951	5/3/1951
5/3/1951	9/10/1953	1/24/1953	9/24/1952	5/13/1952	3/11/1952	2/4/1952	3.0756	-19.3168	27.9711	86.8517	-49.2657	-13.5711	9/14/1953	1/5/1953	10/22/1952	8/8/1952	1/22/1952	1/22/1952
6/29/1951	11/6/1953	3/22/1953	11/20/1952	7/9/1952	5/7/1952	4/1/1952	-53.9244	-76.3168	-29.0289	29.8517	92.7343	-70.5711	9/14/1953	1/5/1953	10/22/1952	8/8/1952	8/8/1952	1/22/1952
11/23/1951	4/2/1954	8/16/1953	4/16/1953	12/3/1952	10/1/1952	8/26/1952	-200.9244	28.6832	-101.0289	32.8517	20.7343	-18.5711	9/14/1953	9/14/1953	1/5/1953	1/5/1953	10/22/1952	8/8/1952
1/22/1952	6/1/1954	10/15/1953	6/15/1953	2/1/1953	11/30/1952	10/25/1952	-260.9244	-31.3168	90.9711	-27.1483	35.7343	-3.5711	9/14/1953	9/14/1953	9/14/1953	1/5/1953	1/5/1953	10/22/1952
8/8/1952	12/17/1954	5/2/1954	12/31/1953	8/19/1953	6/17/1953	5/12/1953	297.0756	-230.3168	-108.0289	25.8517	88.7343	124.4289	10/11/1955	9/14/1953	9/14/1953	9/14/1953	9/14/1953	9/14/1953
10/22/1952	3/2/1955	7/16/1954	3/16/1954	11/2/1953	8/31/1953	7/26/1953	222.0756	-305.3168	-183.0289	-49.1483	13.7343	49.4289	10/11/1955	9/14/1953	9/14/1953	9/14/1953	9/14/1953	9/14/1953
1/5/1953	5/16/1955	9/29/1954	5/30/1954	1/16/1954	11/14/1953	10/9/1953	147.0756	376.6832	-258.0289	-124.1483	-61.2657	-25.5711	10/11/1955	10/11/1955	9/14/1953	9/14/1953	9/14/1953	9/14/1953
9/14/1953	1/23/1956	6/8/1955	2/6/1955	9/25/1954	7/24/1954	6/18/1954	56.0756	124.6832	246.9711	-376.1483	-313.2657	-277.5711	3/20/1956	10/11/1955	10/11/1955	9/14/1953	9/14/1953	9/14/1953
10/11/1955	2/18/1958	7/4/1957	3/4/1957	10/21/1956	8/19/1956	7/14/1956	-119.9244	10.6832	-20.0289	-79.1483	-16.2657	18.4289	10/22/1957	7/15/1957	2/12/1957	8/3/1956	8/3/1956	8/2/1956
11/14/1955	3/24/1958	8/7/1957	4/7/1957	11/24/1956	9/22/1956	8/17/1956	-153.9244	-23.3168	-54.0289	79.8517	-50.2657	-14.5711	10/22/1957	7/15/1957	2/12/1957	2/12/1957	8/3/1956	8/3/1956
3/20/1956	7/29/1958	12/12/1957	8/12/1957	3/31/1957	1/27/1957	12/22/1956	-280.9244	-51.3168	-28.0289	-47.1483	15.7343	51.4289	10/22/1957	10/22/1957	7/15/1957	2/12/1957	2/12/1957	2/12/1957
5/28/1956	10/6/1958	2/19/1958	10/20/1957	6/8/1957	4/6/1957	3/1/1957	300.0756	-120.3168	1.9711	36.8517	-53.2657	-17.5711	8/3/1959	10/22/1957	10/22/1957	7/15/1957	2/12/1957	2/12/1957
8/2/1956	12/11/1958	4/26/1958	12/25/1957	8/13/1957	6/11/1957	5/6/1957	234.0756	-186.3168	-64.0289	-29.1483	33.7343	69.4289	8/3/1959	10/22/1957	10/22/1957	7/15/1957	7/15/1957	7/15/1957
8/3/1956	12/12/1958	4/27/1958	12/26/1957	8/14/1957	6/12/1957	5/7/1957	233.0756	-187.3168	-65.0289	-30.1483	32.7343	68.4289	8/3/1959	10/22/1957	10/22/1957	7/15/1957	7/15/1957	7/15/1957
2/12/1957	6/23/1959	11/6/1958	7/7/1958	2/23/1958	12/22/1957	11/16/1957	40.0756	269.6832	-258.0289	-124.1483	-61.2657	-25.5711	8/3/1959	8/3/1959	10/22/1957	10/22/1957	10/22/1957	10/22/1957
7/15/1957	11/23/1959	4/8/1959	12/7/1958	7/26/1958	5/24/1958	4/18/1958	42.0756	116.6832	238.9711	-277.1483	-214.2657	-178.5711	1/5/1960	8/3/1959	8/3/1959	10/22/1957	10/22/1957	10/22/1957
10/22/1957	3/1/1960	7/16/1959	3/16/1959	11/2/1958	8/31/1958	7/26/1958	6.0756	17.6832	139.9711	273.8517	-313.2657	-277.5711	3/8/1960	8/3/1959	8/3/1959	8/3/1959	10/22/1957	10/22/1957
8/3/1959	12/11/1961	4/26/1961	12/25/1960	8/13/1960	6/11/1960	5/6/1960	0.0756	-9.3168	-61.0289	10.8517	73.7343	-59.5711	12/12/1961	4/17/1961	10/25/1960	8/24/1960	8/24/1960	3/8/1960
9/22/1959	1/30/1962	6/15/1961	2/13/1961	10/2/1960	7/31/1960	6/25/1960	-49.9244	-59.3168	62.9711	22.8517	23.7343	59.4289	12/12/1961	4/17/1961	4/17/1961	10/25/1960	8/24/1960	8/24/1960
1/5/1960	5/15/1962	9/28/1961	5/29/1961	1/15/1961	11/13/1960	10/8/1960	41.0756	74.6832	-42.0289	-82.1483	-19.2657	16.4289	6/26/1962	12/12/1961	4/17/1961	10/25/1960	10/25/1960	10/25/1960
3/8/1960	7/17/1962	11/30/1961	7/31/1961	3/19/1961	1/15/1961	12/10/1960	-21.9244	11.6832	-105.0289	28.8517	-82.2657	-46.5711	6/26/1962	12/12/1961	4/17/1961	4/17/1961	10/25/1960	10/25/1960
8/24/1960	1/2/1963	5/18/1962	1/16/1962	9/4/1961	7/3/1961	5/28/1961	-71.9244	38.6832	-35.0289	98.8517	-77.2657	-41.5711	10/23/1962	6/26/1962	12/12/1961	12/12/1961	4/17/1961	4/17/1961
10/25/1960	3/5/1963	7/19/1962	3/19/1962	11/5/1961	9/3/1961	7/29/1961	-133.9244	-23.3168	-97.0289	36.8517	99.7343	-103.5711	10/23/1962	6/26/1962	12/12/1961	12/12/1961	12/12/1961	4/17/1961
4/17/1961	8/26/1963	1/9/1963	9/9/1962	4/28/1962	2/24/1962	1/19/1962	-35.9244	-78.3168	43.9711	58.8517	-74.2657	-38.5711	7/22/1963	10/23/1962	10/23/1962	6/26/1962	12/12/1961	12/12/1961
12/12/1961	4/21/1964	9/5/1963	5/6/1963	12/23/1962	10/21/1962	9/15/1962	-151.9244	-45.3168	76.9711	-61.1483	1.7343	37.4289	11/22/1963	7/22/1963	7/22/1963	10/23/1962	10/23/1962	10/23/1962
6/26/1962	11/3/1964	3/19/1964	11/18/1963	7/7/1963	5/5/1963	3/30/1963	41.0756	-118.3168	3.9711	14.8517	77.7343	113.4289	12/15/1964	11/22/1963	11/22/1963	7/22/1963	7/22/1963	7/22/1963
10/23/1962	3/2/1965	7/16/1964	3/16/1964	11/3/1963	9/1/1963	7/27/1963	71.0756	151.6832	-115.0289	18.8517	-41.2657	-5.5711	5/13/1965	12/15/1964	11/22/1963	11/22/1963	7/22/1963	7/22/1963
7/22/1963	11/29/1965	4/14/1965	12/13/1964	8/1/1964	5/30/1964	4/24/1964	71.0756	28.6832	1.9711	135.8517	-190.2657	-154.5711	2/9/1966	5/13/1965	12/15/1964	12/15/1964	11/22/1963	11/22/1963
11/22/1963	4/1/1966	8/15/1965	4/15/1965	12/2/1964	9/30/1964	8/25/1964	-51.9244	-48.3168	27.9711	12.8517	75.7343	111.4289	2/9/1966	6/28/1965	5/13/1965	12/15/1964	12/15/1964	12/15/1964
12/15/1964	4/25/1967	9/8/1966	5/9/1966	12/26/1965	10/24/1965	9/18/1965	152.0756	28.6832	-89.0289	44.8517	107.7343	-82.5711	9/25/1967	10/7/1966	2/9/1966	2/9/1966	2/9/1966	6/28/1965
5/13/1965	9/21/1967	2/4/1967	10/5/1966	5/24/1966	3/22/1966	2/14/1966	3.0756	-120.3168	1.9711	-104.1483	-41.2657	-5.5711	9/25/1967	10/7/1966	10/7/1966	2/9/1966	2/9/1966	2/9/1966
6/28/1965	11/6/1967	3/22/1967	11/20/1966	7/9/1966	5/7/1966	4/1/1966	1.0756	-166.3168	-44.0289	89.8517	-87.2657	-51.5711	11/8/1967	10/7/1966	10/7/1966	10/7/1966	2/9/1966	2/9/1966
2/9/1966	6/19/1968	11/3/1967	7/4/1967	2/20/1967	12/19/1966	11/13/1966	-106.9244	4.6832	82.9711	-136.1483	-73.2657	-37.5711	3/5/1968	11/8/1967	9/25/1967	10/7/1966	10/7/1966	10/7/1966
10/7/1966	2/14/1969	6/30/1968	2/29/1968	10/18/1967	8/16/1967	7/11/1967	10.0756	-117.3168	4.9711	20.8517	39.7343	75.4289	2/25/1969	3/5/1968	3/5/1968	11/8/1967	9/25/1967	9/25/1967
9/25/1967	2/2/1970	6/18/1969	2/16/1969	10/5/1968	8/3/1968	6/28/1968	-84.9244	-35.3168	8.9711	54.8517	117.7343	-115.5711	11/10/1969	5/14/1969	2/25/1969	11/29/1968	11/29/1968	3/5/1968
11/8/1967	3/18/1970	8/1/1969	4/1/1969	11/18/1968	9/16/1968	8/11/1968	68.0756	-3.3168	-35.0289	10.8517	73.7343	109.4289	5/26/1970	7/29/1969	2/25/1969	11/29/1968	11/29/1968	11/29/1968
1/12/1968	5/22/1970	10/5/1969	6/5/1969	1/22/1969	11/20/1968	10/15/1968	3.0756	35.6832	-22.0289	33.8517	8.7343	44.4289	5/26/1970	11/10/1969	5/14/1969	2/25/1969	11/29/1968	11/29/1968
3/5/1968	7/14/1970	11/27/1969	7/28/1969	3/16/1969	1/12/1969	12/7/1968	-49.9244	-17.3168	0.9711	-19.1483	43.7343	-8.5711	5/26/1970	11/10/1969	7/29/1969	2/25/1969	2/25/1969	11/29/1968
11/29/1968	4/9/1971	8/23/1970	4/23/1970	12/10/1969	10/8/1969	9/2/1969	18.0756	-89.3168	32.9711	-30.1483	32.7343	-35.5711	4/28/1971	5/26/1970	5/26/1970	11/10/1969	11/10/1969	7/29/1969
2/25/1969	7/6/1971	11/19/1970	7/20/1970	3/8/1970	1/4/1970	11/29/1969	63.0756	159.6832	-55.0289	78.8517	-55.2657	-19.5711	9/8/1971	4/28/1971	5/26/1970	5/26/1970	11/10/1969	11/10/1969
5/14/1969	9/22/1971	2/5/1971	10/6/1970	5/25/1970	3/23/1970	2/15/1970	-14.9244	81.6832	-133.0289	0.8517	63.7343	-97.5711	9/8/1971	4/28/1971	5/26/1970	5/26/1970	5/26/1970	11/10/1969
7/29/1969	12/7/1971	4/22/1971	12/21/1970	8/9/1970	6/7/1970	5/2/1970	-14.9244	5.6832	127.9711	-75.1483	-12.2657	23.4289	11/23/1971	4/28/1971	4/28/1971	5/26/1970	5/26/1970	5/26/1970
11/10/1969	3/20/1972	8/4/1971	4/4/1971	11/21/1970	9/19/1970	8/14/1970	-118.9244	34.6832	23.9711	157.8517	-116.2657	-80.5711	11/23/1971	9/8/1971	4/28/1971	4/28/1971	5/26/1970	5/26/1970

Table 25: Summary of expected turning points, closest match and difference for S&P 500 Days 1970-1989

EXPECTED TURNING POINTS							DIFFERENCES IN DAYS						CLOSEST MATCH					
Spectral Result	*0.00116019*	*0.00158149*	*0.00196067*	*0.00265853*	*0.00319218*	*0.00360268*												
No. Day's	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*	*861.9244*	*632.3168*	*510.0289*	*376.1483*	*313.2657*	*277.5711*	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*
5/26/1970	10/3/1972	2/17/1972	10/18/1971	6/6/1971	4/4/1971	2/27/1971	99.0756	-86.3168	35.9711	-39.1483	23.7343	59.4289	1/11/1973	11/23/1971	11/23/1971	4/28/1971	4/28/1971	4/28/1971
4/28/1971	9/5/1973	1/19/1973	9/19/1972	5/8/1972	3/6/1972	1/30/1972	-14.9244	-8.3168	113.9711	-167.1483	-104.2657	-68.5711	8/22/1973	1/11/1973	1/11/1973	11/23/1971	11/23/1971	11/23/1971
9/8/1971	1/16/1974	6/1/1973	1/30/1973	9/18/1972	7/17/1972	6/11/1972	-96.9244	81.6832	-19.0289	114.8517	177.7343	-201.5711	10/12/1973	8/22/1973	1/11/1973	1/11/1973	1/11/1973	11/23/1971
11/23/1971	4/2/1974	8/16/1973	4/16/1973	12/3/1972	10/1/1972	8/26/1972	-172.9244	5.6832	-95.0289	38.8517	101.7343	137.4289	10/12/1973	8/22/1973	1/11/1973	1/11/1973	1/11/1973	1/11/1973
1/11/1973	5/22/1975	10/5/1974	6/5/1974	1/22/1974	11/20/1973	10/15/1973	53.0756	-2.3168	119.9711	-102.1483	-39.2657	-3.5711	7/15/1975	10/3/1974	10/3/1974	10/12/1973	10/12/1973	10/12/1973
8/22/1973	12/31/1975	5/16/1975	1/14/1975	9/2/1974	7/1/1974	5/26/1974	-106.9244	59.6832	-103.0289	30.8517	93.7343	129.4289	9/16/1975	7/15/1975	10/3/1974	10/3/1974	10/3/1974	10/3/1974
10/12/1973	2/20/1976	7/6/1975	3/6/1975	10/23/1974	8/21/1974	7/16/1974	107.0756	8.6832	130.9711	-20.1483	42.7343	78.4289	6/7/1976	7/15/1975	7/15/1975	10/3/1974	10/3/1974	10/3/1974
10/3/1974	2/10/1977	6/26/1976	2/25/1976	10/14/1975	8/12/1975	7/7/1975	-41.9244	-19.3168	102.9711	-28.1483	-28.2657	7.4289	12/31/1976	6/7/1976	6/7/1976	9/16/1975	7/15/1975	7/15/1975
7/15/1975	11/22/1977	4/7/1977	12/6/1976	7/25/1976	5/23/1976	4/17/1976	103.0756	-97.3168	24.9711	-48.1483	14.7343	50.4289	3/6/1978	12/31/1976	12/31/1976	6/7/1976	6/7/1976	6/7/1976
9/16/1975	1/24/1978	6/9/1977	2/7/1977	9/26/1976	7/25/1976	6/19/1976	40.0756	39.6832	-38.0289	-5.1483	-48.2657	-12.5711	3/6/1978	7/19/1977	12/31/1976	9/21/1976	6/7/1976	6/7/1976
6/7/1976	10/16/1978	3/1/1978	10/30/1977	6/18/1977	4/16/1977	3/11/1977	28.0756	4.6832	-103.0289	30.8517	93.7343	-70.5711	11/14/1978	3/6/1978	7/19/1977	7/19/1977	7/19/1977	12/31/1976
9/21/1976	1/30/1979	6/15/1978	2/13/1978	10/2/1977	7/31/1977	6/25/1977	-77.9244	88.6832	20.9711	-75.1483	-12.2657	23.4289	11/14/1978	9/12/1978	3/6/1978	7/19/1977	7/19/1977	7/19/1977
11/10/1976	3/21/1979	8/4/1978	4/4/1978	11/21/1977	9/19/1977	8/14/1977	-127.9244	38.6832	-29.0289	104.8517	-62.2657	-26.5711	11/14/1978	9/12/1978	3/6/1978	3/6/1978	7/19/1977	7/19/1977
12/31/1976	5/11/1979	9/24/1978	5/25/1978	1/11/1978	11/9/1977	10/4/1977	146.0756	-12.3168	-80.0289	53.8517	-113.2657	-77.5711	10/5/1979	9/12/1978	3/6/1978	3/6/1978	7/19/1977	7/19/1977
7/19/1977	11/27/1979	4/12/1979	12/11/1978	7/30/1978	5/28/1978	4/22/1978	-20.9244	-149.3168	-27.0289	43.8517	-83.2657	-47.5711	11/7/1979	11/14/1978	11/14/1978	9/12/1978	3/6/1978	3/6/1978
3/6/1978	7/14/1980	11/28/1979	7/29/1979	3/17/1979	1/13/1979	12/8/1978	-109.9244	-21.3168	67.9711	-123.1483	-60.2657	-24.5711	3/27/1980	11/7/1979	10/5/1979	11/14/1978	11/14/1978	11/14/1978
9/12/1978	1/20/1981	6/5/1980	2/4/1980	9/23/1979	7/22/1979	6/16/1979	30.0756	-70.3168	8.9711	11.8517	74.7343	110.4289	2/20/1981	3/27/1980	2/13/1980	10/5/1979	10/5/1979	10/5/1979
11/14/1978	3/24/1981	8/7/1980	4/7/1980	11/25/1979	9/23/1979	8/18/1979	-32.9244	112.6832	-11.0289	-18.1483	11.7343	47.4289	2/20/1981	11/28/1980	3/27/1980	11/7/1979	10/5/1979	10/5/1979
10/5/1979	2/12/1982	6/28/1981	2/26/1981	10/15/1980	8/13/1980	7/8/1980	23.0756	43.6832	-6.0289	43.8517	106.7343	-103.5711	3/8/1982	8/11/1981	2/20/1981	11/28/1980	11/28/1980	3/27/1980
11/7/1979	3/17/1982	7/31/1981	3/31/1981	11/17/1980	9/15/1980	8/10/1980	-9.9244	10.6832	-39.0289	10.8517	73.7343	109.4289	3/8/1982	8/11/1981	2/20/1981	11/28/1980	11/28/1980	11/28/1980
2/13/1980	6/23/1982	11/6/1981	7/7/1981	2/23/1981	12/22/1980	11/16/1980	-47.9244	23.6832	34.9711	-3.1483	-24.2657	11.4289	5/7/1982	11/30/1981	8/11/1981	2/20/1981	11/28/1980	11/28/1980
3/27/1980	8/5/1982	12/19/1981	8/19/1981	4/7/1981	2/3/1981	12/29/1980	6.0756	-19.3168	-8.0289	-46.1483	16.7343	-31.5711	8/12/1982	11/30/1981	8/11/1981	2/20/1981	2/20/1981	11/28/1980
11/28/1980	4/8/1983	8/22/1982	4/22/1982	12/9/1981	10/7/1981	9/1/1981	74.0756	-10.3168	14.9711	-9.1483	-12.2657	-21.5711	6/22/1983	8/12/1982	5/7/1982	11/30/1981	9/25/1981	8/11/1981
2/20/1981	7/1/1983	11/14/1982	7/15/1982	3/3/1982	12/30/1981	11/24/1981	-9.9244	-94.3168	27.9711	4.8517	-30.2657	5.4289	6/22/1983	8/12/1982	8/12/1982	3/8/1982	11/30/1981	11/30/1981
8/11/1981	12/20/1983	5/5/1983	1/3/1983	8/22/1982	6/20/1982	5/15/1982	64.0756	47.6832	-144.0289	-10.1483	-44.2657	-8.5711	2/23/1984	6/22/1983	8/12/1982	8/12/1982	5/7/1982	5/7/1982
9/25/1981	2/3/1984	6/19/1983	2/17/1983	10/6/1982	8/4/1982	6/29/1982	19.0756	2.6832	124.9711	-55.1483	7.7343	43.4289	2/23/1984	6/22/1983	6/22/1983	8/12/1982	8/12/1982	8/12/1982
11/30/1981	4/9/1984	8/24/1983	4/24/1983	12/11/1982	10/9/1982	9/3/1982	-46.9244	-16.3168	58.9711	-121.1483	-58.2657	-22.5711	2/23/1984	8/8/1983	6/22/1983	8/12/1982	8/12/1982	8/12/1982
3/8/1982	7/16/1984	11/30/1983	7/31/1983	3/19/1983	1/15/1983	12/10/1982	7.0756	-51.3168	7.9711	94.8517	-156.2657	-120.5711	7/24/1984	10/10/1983	8/8/1983	6/22/1983	8/12/1982	8/12/1982
5/7/1982	9/14/1984	1/29/1984	9/29/1983	5/18/1983	3/16/1983	2/8/1983	-52.9244	24.6832	10.9711	34.8517	97.7343	133.4289	7/24/1984	2/23/1984	10/10/1983	6/22/1983	6/22/1983	6/22/1983
8/12/1982	12/20/1984	5/5/1984	1/4/1984	8/23/1983	6/21/1983	5/16/1983	-149.9244	-72.3168	49.9711	-15.1483	0.7343	36.4289	7/24/1984	2/23/1984	2/23/1984	8/8/1983	6/22/1983	6/22/1983
6/22/1983	10/30/1985	3/15/1985	11/13/1984	7/2/1984	4/30/1984	3/25/1984	-35.9244	123.6832	-112.0289	21.8517	-67.2657	-31.5711	9/25/1985	7/17/1985	7/24/1984	7/24/1984	2/23/1984	2/23/1984
8/8/1983	12/16/1985	5/1/1985	12/30/1984	8/18/1984	6/16/1984	5/11/1984	-82.9244	76.6832	-159.0289	-25.1483	37.7343	73.4289	9/25/1985	7/17/1985	7/24/1984	7/24/1984	7/24/1984	7/24/1984
10/10/1983	2/17/1986	7/3/1985	3/3/1985	10/20/1984	8/18/1984	7/13/1984	-145.9244	13.6832	135.9711	-88.1483	-25.2657	10.4289	9/25/1985	7/17/1985	7/17/1985	7/24/1984	7/24/1984	7/24/1984
2/23/1984	7/3/1986	11/16/1985	7/17/1985	3/5/1985	1/1/1985	11/26/1984	62.0756	-52.3168	-0.0289	133.8517	-161.2657	-125.5711	9/4/1986	9/25/1985	7/17/1985	7/17/1985	7/24/1984	7/24/1984
7/24/1984	12/2/1986	4/17/1986	12/16/1985	8/4/1985	6/2/1985	4/27/1985	-64.9244	139.6832	-82.0289	-18.1483	44.7343	80.4289	9/29/1986	9/4/1986	9/25/1985	7/17/1985	7/17/1985	7/17/1985
7/17/1985	11/25/1987	4/10/1987	12/9/1986	7/28/1986	5/26/1986	4/20/1986	8.0756	39.6832	-71.0289	37.8517	100.7343	136.4289	12/4/1987	5/20/1987	9/29/1986	9/4/1986	9/4/1986	9/4/1986
9/25/1985	2/3/1988	6/19/1987	2/17/1987	10/6/1986	8/4/1986	6/29/1986	-61.9244	-30.3168	91.9711	-7.1483	30.7343	66.4289	12/4/1987	5/20/1987	5/20/1987	9/29/1986	9/4/1986	9/4/1986
9/4/1986	1/12/1989	5/28/1988	1/27/1988	9/15/1987	7/14/1987	6/8/1987	-191.9244	-5.3168	-54.0289	-21.1483	41.7343	-19.5711	7/5/1988	5/23/1988	12/4/1987	8/25/1987	8/25/1987	5/20/1987
9/29/1986	2/6/1989	6/22/1988	2/21/1988	10/10/1987	8/8/1987	7/3/1987	-216.9244	12.6832	-79.0289	-46.1483	16.7343	-44.5711	7/5/1988	7/5/1988	12/4/1987	8/25/1987	8/25/1987	5/20/1987
5/20/1987	9/27/1989	2/10/1989	10/11/1988	5/30/1988	3/28/1988	2/21/1988	11.0756	-220.3168	-98.0289	-7.1483	55.7343	-79.5711	10/9/1989	7/5/1988	7/5/1988	5/23/1988	5/23/1988	12/4/1987
8/25/1987	1/2/1990	5/18/1989	1/16/1989	9/4/1988	7/3/1988	5/28/1988	27.0756	143.6832	-195.0289	-61.1483	1.7343	-5.5711	1/30/1990	10/9/1989	7/5/1988	7/5/1988	7/5/1988	5/23/1988
12/4/1987	4/13/1990	8/27/1989	4/27/1989	12/14/1988	10/12/1988	9/6/1988	-73.9244	42.6832	164.9711	-162.1483	-99.2657	-63.5711	1/30/1990	10/9/1989	10/9/1989	7/5/1988	7/5/1988	7/5/1988
5/23/1988	10/1/1990	2/14/1990	10/15/1989	6/3/1989	4/1/1989	2/24/1989	9.0756	-15.3168	-6.0289	127.8517	190.7343	226.4289	10/11/1990	1/30/1990	10/9/1989	10/9/1989	10/9/1989	10/9/1989
7/5/1988	11/13/1990	3/29/1990	11/27/1989	7/16/1989	5/14/1989	4/8/1989	-33.9244	-58.3168	-49.0289	84.8517	147.7343	183.4289	10/11/1990	1/30/1990	10/9/1989	10/9/1989	10/9/1989	10/9/1989
10/9/1989	2/17/1992	7/3/1991	3/3/1991	10/20/1990	8/18/1990	7/13/1990	-33.9244	-77.3168	44.9711	-9.1483	-33.2657	2.4289	1/15/1992	4/17/1991	4/17/1991	10/11/1990	7/16/1990	7/16/1990

Table 26: Summary of expected turning points, closest match and difference for S&P 500 Days 1990-2009

EXPECTED TURNING POINTS							DIFFERENCES IN DAYS						CLOSEST MATCH					
Spectral Result	*0.00116019*	*0.00158149*	*0.00196067*	*0.00265853*	*0.00319218*	*0.00360268*												
No. Day's	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*	*861.9244*	*632.3168*	*510.0289*	*376.1483*	*313.2657*	*277.5711*	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*
1/30/1990	6/9/1992	10/24/1991	6/24/1991	2/10/1991	12/9/1990	11/3/1990	-62.9244	35.6832	-68.0289	65.8517	-59.2657	-23.5711	4/8/1992	11/29/1991	4/17/1991	4/17/1991	10/11/1990	10/11/1990
7/16/1990	11/23/1992	4/8/1992	12/8/1991	7/27/1991	5/25/1991	4/19/1991	-45.9244	-0.3168	-9.0289	-101.1483	-38.2657	-2.5711	10/9/1992	4/8/1992	11/29/1991	4/17/1991	4/17/1991	4/17/1991
10/11/1990	2/18/1993	7/4/1992	3/4/1992	10/22/1991	8/20/1991	7/15/1991	19.0756	-87.3168	34.9711	37.8517	100.7343	-89.5711	3/10/1993	4/8/1992	4/8/1992	11/29/1991	11/29/1991	4/17/1991
4/17/1991	8/25/1993	1/8/1993	9/8/1992	4/27/1992	2/24/1992	1/19/1992	160.0756	60.6832	30.9711	-19.1483	-40.2657	-4.5711	2/2/1994	3/10/1993	10/9/1992	4/8/1992	1/15/1992	1/15/1992
11/29/1991	4/8/1994	8/22/1993	4/22/1993	12/9/1992	10/7/1992	9/1/1992	-4.9244	163.6832	-43.0289	-61.1483	1.7343	37.4289	4/4/1994	2/2/1994	3/10/1993	10/9/1992	10/9/1992	10/9/1992
1/15/1992	5/25/1994	10/8/1993	6/8/1993	1/25/1993	11/23/1992	10/18/1992	-51.9244	116.6832	-90.0289	43.8517	-45.2657	-9.5711	4/4/1994	2/2/1994	3/10/1993	3/10/1993	10/9/1992	10/9/1992
4/8/1992	8/17/1994	12/31/1993	8/31/1993	4/19/1993	2/15/1993	1/10/1993	12.0756	32.6832	154.9711	-40.1483	22.7343	58.4289	8/30/1994	2/2/1994	2/2/1994	3/10/1993	3/10/1993	3/10/1993
10/9/1992	2/17/1995	7/3/1994	3/3/1994	10/20/1993	8/18/1993	7/13/1993	-71.9244	57.6832	-29.0289	104.8517	-161.2657	-125.5711	12/8/1994	8/30/1994	2/2/1994	2/2/1994	3/10/1993	3/10/1993
3/10/1993	7/19/1995	12/2/1994	8/2/1994	3/21/1994	1/17/1994	12/12/1993	207.0756	5.6832	27.9711	13.8517	15.7343	51.4289	2/12/1996	12/8/1994	8/30/1994	4/4/1994	2/2/1994	2/2/1994
2/2/1994	6/12/1996	10/27/1995	6/27/1995	2/13/1995	12/12/1994	11/6/1994	-19.9244	107.6832	-201.0289	-67.1483	-4.2657	31.4289	5/24/1996	2/12/1996	12/8/1994	12/8/1994	12/8/1994	12/8/1994
4/4/1994	8/12/1996	12/27/1995	8/27/1995	4/15/1995	2/11/1995	1/6/1995	-19.9244	46.6832	168.9711	-128.1483	-65.2657	-29.5711	7/24/1996	2/12/1996	2/12/1996	12/8/1994	12/8/1994	12/8/1994
8/30/1994	1/7/1997	5/23/1996	1/22/1996	9/10/1995	7/9/1995	6/3/1995	93.0756	0.6832	20.9711	154.8517	-213.2657	-177.5711	4/11/1997	5/24/1996	2/12/1996	2/12/1996	12/8/1994	12/8/1994
12/8/1994	4/17/1997	8/31/1996	5/1/1996	12/19/1995	10/17/1995	9/11/1995	-6.9244	-38.3168	22.9711	54.8517	117.7343	153.4289	4/11/1997	7/24/1996	5/24/1996	2/12/1996	2/12/1996	2/12/1996
2/12/1996	6/22/1998	11/5/1997	7/6/1997	2/22/1997	12/21/1996	11/15/1996	24.0756	-9.3168	-86.0289	47.8517	110.7343	-114.5711	7/17/1998	10/27/1997	4/11/1997	4/11/1997	4/11/1997	7/24/1996
5/24/1996	10/2/1998	2/15/1998	10/16/1997	6/4/1997	4/2/1997	2/25/1997	-32.9244	-111.3168	10.9711	-54.1483	8.7343	44.4289	8/31/1998	10/27/1997	10/27/1997	4/11/1997	4/11/1997	4/11/1997
7/24/1996	12/2/1998	4/17/1998	12/16/1997	8/4/1997	6/2/1997	4/27/1997	-93.9244	90.6832	-50.0289	83.8517	-52.2657	-16.5711	8/31/1998	7/17/1998	10/27/1997	10/27/1997	4/11/1997	4/11/1997
4/11/1997	8/20/1999	1/3/1999	9/3/1998	4/22/1998	2/18/1998	1/13/1998	-35.9244	-125.3168	-3.0289	85.8517	-114.2657	-78.5711	7/16/1999	8/31/1998	8/31/1998	7/17/1998	10/27/1997	10/27/1997
10/27/1997	3/6/2000	7/21/1999	3/21/1999	11/7/1998	9/5/1998	7/31/1998	-10.9244	-5.3168	116.9711	-68.1483	-5.2657	-14.5711	2/25/2000	7/16/1999	7/16/1999	8/31/1998	8/31/1998	7/17/1998
7/17/1998	11/24/2000	4/9/2000	12/9/1999	7/28/1999	5/26/1999	4/20/1999	-84.9244	-16.3168	-55.0289	-12.1483	50.7343	86.4289	9/1/2000	3/24/2000	10/15/1999	7/16/1999	7/16/1999	7/16/1999
8/31/1998	1/8/2001	5/24/2000	1/23/2000	9/11/1999	7/10/1999	6/4/1999	85.0756	-61.3168	32.9711	33.8517	5.7343	41.4289	4/4/2001	3/24/2000	2/25/2000	10/15/1999	7/16/1999	7/16/1999
7/16/1999	11/23/2001	4/8/2001	12/7/2000	7/26/2000	5/24/2000	4/18/2000	41.0756	-4.3168	-97.0289	36.8517	-61.2657	-25.5711	1/4/2002	4/4/2001	9/1/2000	9/1/2000	3/24/2000	3/24/2000
10/15/1999	2/22/2002	7/8/2001	3/8/2001	10/25/2000	8/23/2000	7/18/2000	-49.9244	-48.3168	26.9711	-54.1483	8.7343	44.4289	1/4/2002	5/21/2001	4/4/2001	9/1/2000	9/1/2000	9/1/2000
2/25/2000	7/5/2002	11/18/2001	7/19/2001	3/7/2001	1/3/2001	11/28/2000	95.0756	46.6832	-59.0289	27.8517	90.7343	-88.5711	10/9/2002	1/4/2002	5/21/2001	4/4/2001	4/4/2001	9/1/2000
3/24/2000	8/2/2002	12/16/2001	8/16/2001	4/4/2001	1/31/2001	12/26/2000	67.0756	18.6832	35.9711	-0.1483	62.7343	98.4289	10/9/2002	1/4/2002	9/21/2001	4/4/2001	4/4/2001	4/4/2001
9/1/2000	1/10/2003	5/26/2002	1/24/2002	9/12/2001	7/11/2001	6/5/2001	-44.9244	135.6832	-20.0289	8.8517	-51.2657	-15.5711	11/27/2002	10/9/2002	1/4/2002	9/21/2001	5/21/2001	5/21/2001
4/4/2001	8/13/2003	12/27/2002	8/27/2002	4/15/2002	2/11/2002	1/6/2002	-155.9244	-30.3168	42.9711	-101.1483	-38.2657	-2.5711	3/11/2003	11/27/2002	10/9/2002	1/4/2002	1/4/2002	1/4/2002
5/21/2001	9/29/2003	2/12/2003	10/13/2002	6/1/2002	3/30/2002	2/22/2002	134.0756	26.6832	-4.0289	129.8517	-85.2657	-49.5711	2/11/2004	3/11/2003	10/9/2002	10/9/2002	1/4/2002	1/4/2002
9/21/2001	1/30/2004	6/15/2003	2/13/2003	10/2/2002	7/31/2002	6/25/2002	11.0756	-96.3168	25.9711	6.8517	69.7343	105.4289	2/11/2004	3/11/2003	3/11/2003	10/9/2002	10/9/2002	10/9/2002
1/4/2002	5/14/2004	9/28/2003	5/29/2003	1/15/2003	11/13/2002	10/8/2002	89.0756	135.6832	-79.0289	-49.1483	13.7343	0.4289	8/12/2004	2/11/2004	3/11/2003	11/27/2002	11/27/2002	10/9/2002
10/9/2002	2/16/2005	7/2/2004	3/2/2004	10/20/2003	8/18/2003	7/13/2003	18.0756	40.6832	-20.0289	113.8517	-160.2657	-124.5711	3/7/2005	8/12/2004	2/11/2004	2/11/2004	3/11/2003	3/11/2003
11/27/2002	4/6/2005	8/20/2004	4/20/2004	12/8/2003	10/6/2003	8/31/2003	13.0756	-8.3168	-69.0289	64.8517	127.7343	163.4289	4/20/2005	8/12/2004	2/11/2004	2/11/2004	2/11/2004	2/11/2004
3/11/2003	7/19/2005	12/2/2004	8/2/2004	3/21/2004	1/18/2004	12/13/2003	14.0756	94.6832	9.9711	-39.1483	23.7343	59.4289	8/3/2005	3/7/2005	8/12/2004	2/11/2004	2/11/2004	2/11/2004
2/11/2004	6/21/2006	11/4/2005	7/5/2005	2/21/2005	12/20/2004	11/14/2004	-8.9244	-22.3168	28.9711	13.8517	76.7343	-94.5711	6/13/2006	10/13/2005	8/3/2005	3/7/2005	3/7/2005	8/12/2004
8/12/2004	12/21/2006	5/6/2006	1/4/2006	8/23/2005	6/21/2005	5/16/2005	73.0756	-1.3168	-83.0289	-20.1483	42.7343	-26.5711	3/5/2007	5/5/2006	10/13/2005	8/3/2005	8/3/2005	4/20/2005
3/7/2005	7/16/2007	11/29/2006	7/30/2006	3/18/2006	1/14/2006	12/9/2005	29.0756	95.6832	-47.0289	47.8517	-93.2657	-57.5711	8/15/2007	3/5/2007	6/13/2006	5/5/2006	10/13/2005	10/13/2005
4/20/2005	8/29/2007	1/12/2007	9/12/2006	5/1/2006	2/27/2006	1/22/2006	-14.9244	51.6832	-91.0289	3.8517	66.7343	-101.5711	8/15/2007	3/5/2007	6/13/2006	5/5/2006	5/5/2006	10/13/2005
8/3/2005	12/12/2007	4/27/2007	12/26/2006	8/14/2006	6/12/2006	5/7/2006	-64.9244	-53.3168	68.9711	-62.1483	0.7343	-2.5711	10/9/2007	3/5/2007	3/5/2007	6/13/2006	6/13/2006	5/5/2006
10/13/2005	2/21/2008	7/7/2007	3/7/2007	10/24/2006	8/22/2006	7/17/2006	17.0756	38.6832	-2.0289	131.8517	-70.2657	-34.5711	3/10/2008	8/15/2007	3/5/2007	3/5/2007	6/13/2006	6/13/2006
5/5/2006	9/12/2008	1/27/2008	9/27/2007	5/16/2007	3/14/2007	2/6/2007	68.0756	42.6832	11.9711	-72.1483	-9.2657	26.4289	11/20/2008	3/10/2008	10/9/2007	3/5/2007	3/5/2007	3/5/2007
6/13/2006	10/21/2008	3/6/2008	11/5/2007	6/24/2007	4/22/2007	3/17/2007	29.0756	3.6832	-27.0289	51.8517	-48.2657	-12.5711	11/20/2008	3/10/2008	10/9/2007	8/15/2007	3/5/2007	3/5/2007
3/5/2007	7/13/2009	11/26/2008	7/27/2008	3/15/2008	1/12/2008	12/7/2007	-126.9244	-6.3168	-69.0289	-5.1483	57.7343	-59.5711	3/9/2009	11/20/2008	5/19/2008	3/10/2008	3/10/2008	10/9/2007
8/15/2007	12/23/2009	5/8/2009	1/6/2009	8/25/2008	6/23/2008	5/18/2008	46.0756	-60.3168	-47.0289	86.8517	-35.2657	0.4289	2/8/2010	3/9/2009	11/20/2008	11/20/2008	5/19/2008	5/19/2008
10/9/2007	2/16/2010	7/2/2009	3/2/2009	10/19/2008	8/17/2008	7/12/2008	-8.9244	-115.3168	6.9711	31.8517	-90.2657	-54.5711	2/8/2010	3/9/2009	3/9/2009	11/20/2008	5/19/2008	5/19/2008
3/10/2008	7/19/2010	12/2/2009	8/2/2009	3/21/2009	1/17/2009	12/12/2008	-17.9244	67.6832	-146.0289	-12.1483	50.7343	-22.5711	7/2/2010	2/8/2010	3/9/2009	3/9/2009	3/9/2009	11/20/2008
5/19/2008	9/27/2010	2/10/2010	10/11/2009	5/30/2009	3/28/2009	2/20/2009	-87.9244	-2.3168	119.9711	-82.1483	-19.2657	16.4289	7/2/2010	2/8/2010	2/8/2010	3/9/2009	3/9/2009	3/9/2009
11/20/2008	3/31/2011	8/14/2010	4/14/2010	12/1/2009	9/29/2009	8/24/2009	28.0756	-43.3168	8.9711	68.8517	131.7343	167.4289	4/29/2011	7/2/2010	4/23/2010	2/8/2010	2/8/2010	2/8/2010
3/9/2009	7/18/2011	12/1/2010	8/1/2010	3/20/2010	1/16/2010	12/11/2009	76.0756	148.6832	-30.0289	33.8517	22.7343	58.4289	10/3/2011	4/29/2011	7/2/2010	4/23/2010	2/8/2010	2/8/2010

Table 27: Summary of expected turning points, closest match and difference for S&P 500 Days 2010-2018

EXPECTED TURNING POINTS						
Spectral Result	*0.00116019*	*0.00158149*	*0.00196067*	*0.00265853*	*0.00319218*	*0.00360268*
No. Day's	*861.924368*	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*
2/8/2010	6/18/2012	11/2/2011	7/3/2011	2/19/2011	12/18/2010	11/12/2010
4/23/2010	8/31/2012	1/15/2012	9/15/2011	5/4/2011	3/2/2011	1/25/2011
7/2/2010	11/9/2012	3/25/2012	11/24/2011	7/13/2011	5/11/2011	4/5/2011
4/29/2011	9/6/2013	1/20/2013	9/20/2012	5/9/2012	3/7/2012	1/31/2012
10/3/2011	2/10/2014	6/26/2013	2/24/2013	10/13/2012	8/11/2012	7/6/2012
4/2/2012	8/11/2014	12/25/2013	8/25/2013	4/13/2013	2/9/2013	1/4/2013
6/1/2012	10/10/2014	2/23/2014	10/24/2013	6/12/2013	4/10/2013	3/5/2013
9/14/2012	1/23/2015	6/8/2014	2/6/2014	9/25/2013	7/24/2013	6/18/2013
11/15/2012	3/26/2015	8/9/2014	4/9/2014	11/26/2013	9/24/2013	8/19/2013
2/3/2014	6/13/2016	10/28/2015	6/28/2015	2/14/2015	12/13/2014	11/7/2014
10/15/2014	2/22/2017	7/8/2016	3/8/2016	10/26/2015	8/24/2015	7/19/2015
5/21/2015	9/28/2017	2/11/2017	10/12/2016	5/31/2016	3/29/2016	2/22/2016
8/25/2015	1/2/2018	5/18/2017	1/16/2017	9/4/2016	7/3/2016	5/28/2016
11/3/2015	3/13/2018	7/27/2017	3/27/2017	11/13/2016	9/11/2016	8/6/2016
2/11/2016	6/21/2018	11/4/2017	7/5/2017	2/21/2017	12/20/2016	11/14/2016
6/27/2016		3/21/2018	11/19/2017	7/8/2017	5/6/2017	3/31/2017
8/15/2016		5/9/2018	1/7/2018	8/26/2017	6/24/2017	5/19/2017
11/4/2016		7/29/2018	3/29/2018	11/15/2017	9/13/2017	8/8/2017
1/26/2018						
6/12/2018						

DIFFERENCES IN DAYS					
861.9244	*632.3168*	*510.0289*	*376.1483*	*313.2657*	*277.5711*
-17.9244	-30.3168	-65.0289	68.8517	131.7343	-133.5711
13.0756	77.6832	17.9711	-5.1483	57.7343	93.4289
5.0756	7.6832	-52.0289	-75.1483	-12.2657	23.4289
149.0756	-66.3168	-6.0289	22.8517	25.7343	61.4289
-7.9244	221.6832	-101.0289	-29.1483	33.7343	-35.5711
64.0756	39.6832	161.9711	-149.1483	-86.2657	-50.5711
4.0756	-20.3168	101.9711	-209.1483	-146.2657	-110.5711
-100.9244	-125.3168	-3.0289	130.8517	193.7343	-215.5711
55.0756	66.6832	-65.0289	68.8517	131.7343	167.4289
13.0756	5.6832	-38.0289	95.8517	-59.2657	-23.5711
-110.9244	-11.3168	-26.0289	7.8517	0.7343	36.4289
119.0756	-99.3168	22.9711	26.8517	-47.2657	-11.5711
23.0756	-195.3168	-73.0289	-20.1483	-6.2657	29.4289
-46.9244	182.6832	-143.0289	-9.1483	-27.2657	8.4289
-9.9244	82.6832	204.9711	-109.1483	-46.2657	-10.5711
	-54.3168	67.9711	201.8517	-183.2657	-147.5711
	33.6832	18.9711	152.8517	215.7343	-196.5711
	-47.3168	-62.0289	71.8517	134.7343	170.4289

CLOSEST MATCH					
861.924368	*632.316775*	*510.028938*	*376.148254*	*313.265686*	*277.571114*
6/1/2012	10/3/2011	4/29/2011	4/29/2011	4/29/2011	7/2/2010
9/14/2012	4/2/2012	10/3/2011	4/29/2011	4/29/2011	4/29/2011
11/15/2012	4/2/2012	10/3/2011	4/29/2011	4/29/2011	4/29/2011
2/3/2014	11/15/2012	9/14/2012	6/1/2012	4/2/2012	4/2/2012
2/3/2014	2/3/2014	11/15/2012	9/14/2012	9/14/2012	6/1/2012
10/15/2014	2/3/2014	2/3/2014	11/15/2012	11/15/2012	11/15/2012
10/15/2014	2/3/2014	2/3/2014	11/15/2012	11/15/2012	11/15/2012
10/15/2014	2/3/2014	2/3/2014	2/3/2014	2/3/2014	11/15/2012
5/21/2015	10/15/2014	2/3/2014	2/3/2014	2/3/2014	2/3/2014
6/27/2016	11/3/2015	5/21/2015	5/21/2015	10/15/2014	10/15/2014
11/4/2016	6/27/2016	2/11/2016	11/3/2015	8/25/2015	8/25/2015
1/26/2018	11/4/2016	11/4/2016	6/27/2016	2/11/2016	2/11/2016
1/26/2018	11/4/2016	11/4/2016	8/15/2016	6/27/2016	6/27/2016
1/26/2018	1/26/2018	11/4/2016	11/4/2016	8/15/2016	8/15/2016
6/12/2018	1/26/2018	1/26/2018	11/4/2016	11/4/2016	11/4/2016
	1/26/2018	1/26/2018	1/26/2018	11/4/2016	11/4/2016
	6/12/2018	1/26/2018	1/26/2018	1/26/2018	11/4/2016
	6/12/2018	1/26/2018	1/26/2018	1/26/2018	1/26/2018

Table 30: Kolmogorov-Smirnov test results for selected DJIA cycles

Dow Jones Industrial Average					
85 month cycle		53 month cycle		24 month cycle	
K-S statistic	0.114	K-S statistic	0.11	K-S statistic	0.136
P-value	0.039	P-value	0.048	P-value	0.006
Alpha	0.05	Alpha	0.05	Alpha	0.05
112 quarter cycle		80 quarter cycle		47 quarter cycle	
K-S statistic	0.166	K-S statistic	0.162	K-S statistic	0.157
P-value	0.055	P-value	0.061	P-value	0.054
Alpha	0.05	Alpha	0.05	Alpha	0.05
348 week cycle		131 week cycle		109 week cycle	
K-S statistic	0.098	K-S statistic	0.111	K-S statistic	0.115
P-value	0.072	P-value	0.068	P-value	0.053
Alpha	0.05	Alpha	0.05	Alpha	0.05

Table 31: Kolmogorv-Smirnov test results for 85, 53 and 24 month cycles of DJIA without outliers

85 month cycle without outliers	
K-S statistic	0.098
P-value	0.154
Alpha	0.05
53 month cycle without outliers	
K-S statistic	0.088
P-value	0.240
Alpha	0.05
24 month cycle without outliers	
K-S statistic	0.122
P-value	0.034
Alpha	0.05

Table 32: Kolmogorv-Smirnov test results for selected S&P 500 cycles

Standard & Poor's 500							
862 day cycle		510 day cycle		313 day cycle		254 day cycle	
K-S statistic	0.083	K-S statistic	0.097	K-S statistic	0.064	K-S statistic	0.073
P-value	0.239	P-value	0.109	P-value	0.531	P-value	0.375
Alpha	0.05	Alpha	0.05	Alpha	0.05	Alpha	0.05
632 day cycle		376 day cycle		278 day cycle		386 week cycle	
K-S statistic	0.085	K-S statistic	0.078	K-S statistic	0.069	K-S statistic	0.12
P-value	0.232	P-value	0.304	P-value	0.435	P-value	0.137
Alpha	0.05	Alpha	0.05	Alpha	0.05	Alpha	0.05
102 week cycle		16 week cycle		53 month cycle		43 month cycle	
K-S statistic	0.1	K-S statistic	0.248	K-S statistic	0.132	K-S statistic	0.115
P-value	0.261	P-value	0.001	P-value	0.021	P-value	0.059
Alpha	0.05	Alpha	0.05	Alpha	0.05	Alpha	0.05
24 month cycle		125 quarter cycle		27 quarter cycle		16 quarter cycle	
K-S statistic	0.097	K-S statistic	0.119	K-S statistic	0.144	K-S statistic	0.113
P-value	0.15	P-value	0.861	P-value	0.423	P-value	0.718
Alpha	0.05	Alpha	0.05	Alpha	0.05	Alpha	0.05

Table 33: Kolmogorv-Smirnov test results for 16 week and 53 month cycles of S&P 500 without outliers

16 week cycle without outliers	
K-S statistic	0.197
P-value	0.036
Alpha	0.05
53 month cycle without outliers	
K-S statistic	0.082
P-value	0.400
Alpha	0.05

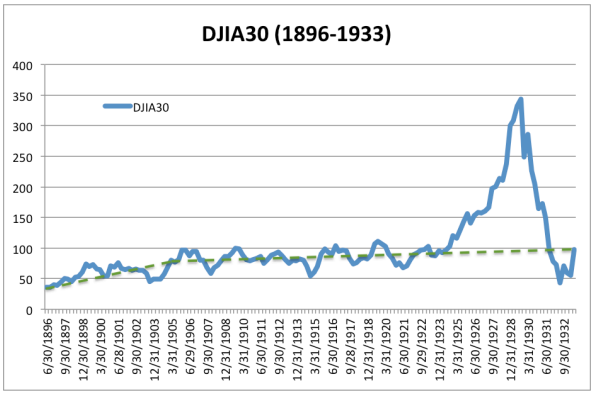

Figure 59: 1st cycles of the 112-quarter cycle strategy

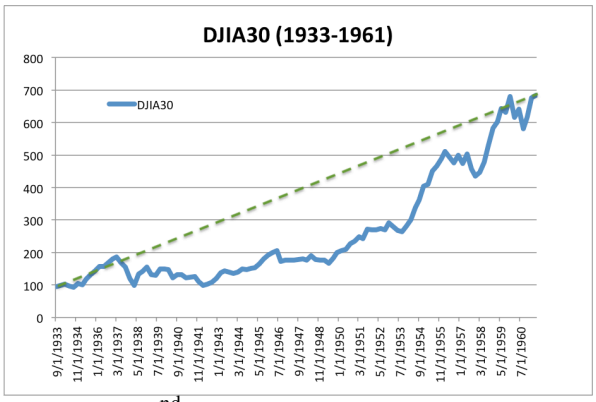

Figure 60: 2nd cycle of the 112-quarter cycle strategy

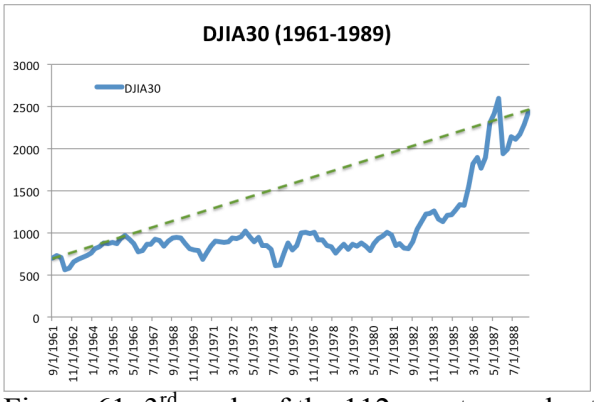

Figure 61: 3rd cycle of the 112-quarter cycle strategy

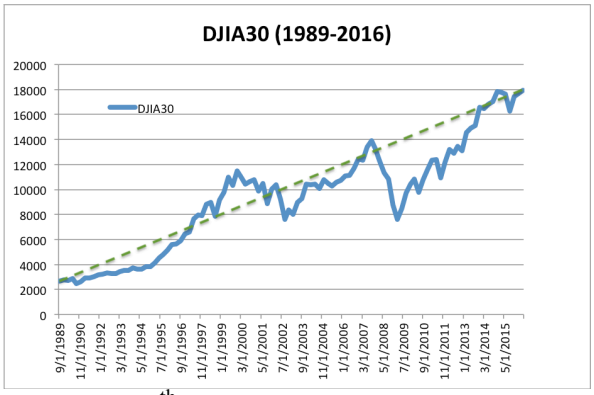

Figure 62: 4th cycle of the 112-quarter cycle strategy

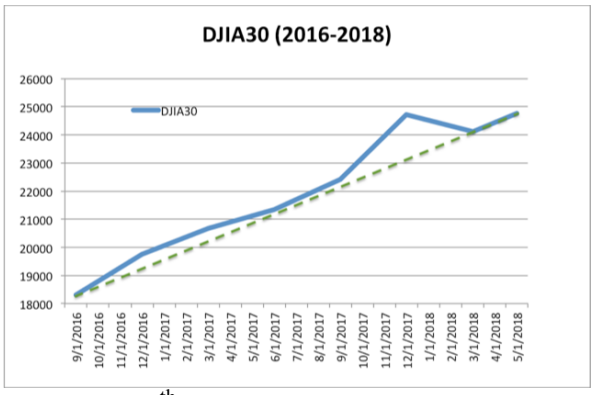

Figure 63: 5th ongoing cycle of the 112-quarter cycle strategy

Table 35: Return of Long/Short cycle strategy

	LONG/SHORT STRATEGY					
SPECTRAL ANALYSIS	0.001160195	0.001581486	0.001960673	0.002658526	0.00360268	0.003931082
CYCLES	861.9243684	632.3167745	510.0289381	376.148254	277.5711135	254.3829057
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$-653,604.71	$-776,502.05	$-1,042,372.09	$-1,848,562.37	$-2,198,202.55	$-1,740,130.40
Amount Settled	$ 655,112.18	$ 794,261.81	$ 1,071,483.40	$ 1,907,252.94	$ 2,251,319.98	$ 1,775,329.66
Closing Cash	$ 11,507.47	$ 27,759.77	$ 39,111.31	$ 68,690.56	$ 63,117.43	$ 45,199.26
Outstanding Trades	$ 71,184.80	$ 49,077.65	$ 70,843.83	$ 138,020.22	$ 153,695.84	$ 124,174.77
Closing Balance	$ 82,692.27	$ 76,837.42	$ 109,955.14	$ 206,710.78	$ 216,813.28	$ 169,374.02
Profit/(Loss)	$ 72,692.27	$ 66,837.42	$ 99,955.14	$ 196,710.78	$ 206,813.28	$ 159,374.02
Trade % of Cash Balance	33%	33%	33%	33%	33%	33%
Winners	96	100	101	107	110	112
Losers	61	57	56	50	47	45
Total Trades	157	157	157	157	157	157
Largest Winner	$ 7,007.66	$ 4,591.70	$ 8,251.54	$ 12,595.60	$ 19,420.13	$ 16,050.09
Largest Loser	$ -4,510.65	$ -4,580.84	$ -5,165.32	$ -4,853.90	$ -7,025.79	$ -7,096.94
Average Profit/Loss	$ 471.92	$ 435.12	$ 650.92	$ 1,281.04	$ 1,348.55	$ 1,039.62
Min CB	$ 427.93	$ 699.31	$ 730.71	$ 1,110.16	$ 2,081.50	$ 2,004.17
Max Drawdown	$ 9,572.07	$ 9,300.69	$ 9,269.29	$ 8,889.84	$ 7,918.50	$ 7,995.83
Number Long Trades	83	83	83	83	83	83
Number of Winners	73	72	69	69	71	71
Number of Losers	10	11	14	14	12	12
Long Trades Amount	$ 342,029.15	$ 387,264.78	$ 555,195.59	$ 990,921.19	$ 1,150,126.51	$ 907,070.77
Long Trade Profit/(Loss)	$ 108,455.94	$ 92,904.65	$ 117,452.57	$ 202,292.80	$ 200,931.41	$ 143,485.18
Number Short Trades	74	74	74	74	74	74
Number of Winners	23	28	32	38	39	41
Number of Losers	51	46	42	36	35	33
Short Trades Amount	$ 311,575.56	$ 389,237.27	$ 487,176.50	$ 857,641.19	$ 1,048,076.04	$ 833,059.64
Short Trade Profit/(Loss)	$ -35,763.67	$ -26,067.24	$ -17,497.42	$ -5,582.01	$ 5,881.87	$ 15,888.84

	LONG/SHORT STRATEGY					
SPECTRAL ANALYSIS	0.001160195	0.001581486	0.001960673	0.002658526	0.00360268	0.003931082
CYCLES	861.9243684	632.3167745	510.0289381	376.148254	277.5711135	254.3829057
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$-653,604.71	$-776,502.05	$-1,042,372.09	$-1,848,562.37	$-2,198,202.55	$-1,740,130.40
Amount Settled	$ 655,112.18	$ 794,261.81	$ 1,071,483.40	$ 1,907,252.94	$ 2,251,319.98	$ 1,775,329.66
Closing Cash	$ 11,507.47	$ 27,759.77	$ 39,111.31	$ 68,690.56	$ 63,117.43	$ 45,199.26
Outstanding Trades	$ 71,184.80	$ 49,077.65	$ 70,843.83	$ 138,020.22	$ 153,695.84	$ 124,174.77
Closing Balance	$ 82,692.27	$ 76,837.42	$ 109,955.14	$ 206,710.78	$ 216,813.28	$ 169,374.02
Profit/(Loss)	$ 72,692.27	$ 66,837.42	$ 99,955.14	$ 196,710.78	$ 206,813.28	$ 159,374.02
Trade % of Cash Balance	33%	33%	33%	33%	33%	33%
Winners	96	100	101	107	110	112
Losers	61	57	56	50	47	45
Total Trades	157	157	157	157	157	157
Largest Winner	$ 7,007.66	$ 4,591.70	$ 8,251.54	$ 12,595.60	$ 19,420.13	$ 16,050.09
Largest Loser	$ -4,510.65	$ -4,580.84	$ -5,165.32	$ -4,853.90	$ -7,025.79	$ -7,096.94
Average Profit/Loss	$ 471.92	$ 435.12	$ 650.92	$ 1,281.04	$ 1,348.55	$ 1,039.62
Min CB	$ 427.93	$ 699.31	$ 730.71	$ 1,110.16	$ 2,081.50	$ 2,004.17
Max Drawdown	$ 9,572.07	$ 9,300.69	$ 9,269.29	$ 8,889.84	$ 7,918.50	$ 7,995.83
Number Long Trades	83	83	83	83	83	83
Number of Winners	73	72	69	69	71	71
Number of Losers	10	11	14	14	12	12
Long Trades Amount	$ 342,029.15	$ 387,264.78	$ 555,195.59	$ 990,921.19	$ 1,150,126.51	$ 907,070.77
Long Trade Profit/(Loss)	$ 108,455.94	$ 92,904.65	$ 117,452.57	$ 202,292.80	$ 200,931.41	$ 143,485.18
Number Short Trades	74	74	74	74	74	74
Number of Winners	23	28	32	38	39	41
Number of Losers	51	46	42	36	35	33
Short Trades Amount	$ 311,575.56	$ 389,237.27	$ 487,176.50	$ 857,641.19	$ 1,048,076.04	$ 833,059.64
Short Trade Profit/(Loss)	$ -35,763.67	$ -26,067.24	$ -17,497.42	$ -5,582.01	$ 5,881.87	$ 15,888.84

Table 36: Return of Long Only cycle strategy

	LONG ONLY					
SPECTRAL ANALYSIS	0.001160195	0.001581486	0.001960673	0.002658526	0.00360268	0.003931082
CYCLES	861.9243684	632.3167745	510.0289381	376.148254	277.5711135	254.3829057
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$-1,661,064.78	$-1,642,156.40	$-1,371,297.72	$-1,502,234.38	$-1,404,586.31	$-880,283.37
Amount Settled	$ 1,693,351.15	$ 1,718,949.08	$ 1,422,967.46	$ 1,549,297.85	$ 1,431,479.14	$ 888,106.75
Closing Cash	$ 42,286.38	$ 86,792.67	$ 61,669.74	$ 57,063.47	$ 36,892.83	$ 17,823.39
Outstanding Trades	$ 317,056.81	$ 152,704.39	$ 111,524.73	$ 111,932.19	$ 90,722.51	$ 51,197.93
Closing Balance	$ 359,343.18	$ 239,497.07	$ 173,194.47	$ 168,995.66	$ 127,615.34	$ 69,021.32
Profit/(Loss)	$ 349,343.18	$ 229,497.07	$ 163,194.47	$ 158,995.66	$ 117,615.34	$ 59,021.32
Trade % of Cash Balance	33%	33%	33%	33%	33%	33%
Winners	124	118	111	105	106	104
Losers	33	39	46	52	51	53
Total Trades	157	157	157	157	157	157
Largest Winner	$ 21,398.25	$ 11,216.54	$ 10,378.68	$ 9,804.43	$ 10,664.86	$ 6,183.42
Largest Loser	$ -9,442.04	$ -11,332.21	$ -10,283.89	$ -7,066.19	$ -4,877.56	$ -3,783.66
Average Profit/Loss	$ 2,269.07	$ 1,485.90	$ 1,054.72	$ 1,028.64	$ 757.76	$ 375.74
Min CB	$ 557.95	$ 890.35	$ 832.73	$ 1,185.23	$ 2,235.07	$ 1,865.37
Max Drawdown	$ 9,442.05	$ 9,109.65	$ 9,167.27	$ 8,814.77	$ 7,764.93	$ 8,134.63
Number Long Trades	157	157	157	157	157	157
Number of Winners	124	118	111	105	106	104
Number of Losers	33	39	46	52	51	53
Long Trades Amount	$ 1,661,064.78	$ 1,642,156.40	$ 1,371,297.72	$ 1,502,234.38	$ 1,404,586.31	$ 880,283.37
Long Trade Profit/(Loss)	$ 349,343.18	$ 229,497.07	$ 163,194.47	$ 158,995.66	$ 117,615.34	$ 59,021.32

Table 37: Return of maximizer cycle strategy

	MAXIMISER					
SPECTRAL ANALYSIS	0.001160195	0.001581486	0.001960673	0.002658526	0.00360268	0.003931082
CYCLES	861.9243684	632.3167745	510.0289381	376.148254	277.5711135	254.3829057
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$-4,046,717.71	$-3,526,710.26	$-3,418,891.37	$-6,858,648.36	$-4,109,751.20	$-663,675.49
Amount Settled	$ 4,040,377.44	$ 3,541,602.04	$ 3,431,063.10	$ 6,886,257.18	$ 4,114,663.82	$ 654,647.79
Closing Cash	$ 3,659.73	$ 24,891.78	$ 22,171.73	$ 37,608.82	$ 14,912.62	$ 972.30
Outstanding Trades	$ 748,622.68	$ 442,089.46	$ 371,106.67	$ 771,350.82	$ 301,927.28	$ 42,335.39
Closing Balance	$ 752,282.40	$ 466,981.24	$ 393,278.40	$ 808,959.64	$ 316,839.90	$ 43,307.69
Profit/(Loss)	$ 742,282.40	$ 456,981.24	$ 383,278.40	$ 798,959.64	$ 306,839.90	$ 33,307.69
Trade % of Cash Balance	75%	75%	75%	75%	75%	75%
Winners	124	118	111	105	106	104
Losers	33	39	46	52	51	53
Total Trades	157	157	157	157	157	157
Largest Winner	$ 93,515.12	$ 43,967.46	$ 40,999.74	$ 92,059.97	$ 39,133.23	$ 6,269.79
Largest Loser	$ -40,977.03	$ -42,244.58	$ -55,195.84	$ -24,474.99	$ -23,456.38	$ -4,871.30
Average Profit/Loss	$ 4,832.93	$ 2,969.95	$ 2,490.82	$ 5,204.36	$ 1,990.50	$ 203.38
Min CB	$ 0.22	$ 0.90	$ 1.10	$ 3.77	$ 44.80	$ 15.75
Max Drawdown	$ 9,999.78	$ 9,999.10	$ 9,998.90	$ 9,996.23	$ 9,955.20	$ 9,984.25
Number Long Trades	157	157	157	157	157	157
Number of Winners	124	118	111	105	106	104
Number of Losers	33	39	46	52	51	53
Long Trades Amount	$ 4,046,717.71	$ 3,526,710.26	$ 3,418,891.37	$ 6,858,648.36	$ 4,109,751.20	$ 663,675.49
Long Trade Profit/(Loss)	$ 742,282.40	$ 456,981.24	$ 383,278.40	$ 798,959.64	$ 306,839.90	$ 33,307.69

Table 38: Return of Long/Short random dates strategy

	LONG SHORT RANDOM TRADES 33%							
	1	2	3	4	5	6	7	8
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$ -38,890.41	$ -73,225.82	$ -35,387.71	$ -38,540.70	$ -45,375.40	$ -43,976.35	$ -42,514.74	$ -44,044.38
Amount Settled	$ 27,900.81	$ 63,261.23	$ 25,388.33	$ 28,527.02	$ 35,135.43	$ 33,977.71	$ 32,529.40	$ 34,053.41
Closing Cash	$ -989.60	$ 35.41	$ 0.62	$ -13.68	$ -239.97	$ 1.36	$ 14.66	$ 9.03
Outstanding Trades	$ 11,078.50	$ 12,152.68	$ 10,670.42	$ 10,279.21	$ 11,354.92	$ 10,850.61	$ 10,312.42	$ 11,714.16
Closing Balance	$ 10,088.91	$ 12,188.08	$ 10,671.04	$ 10,265.53	$ 11,114.95	$ 10,851.97	$ 10,327.08	$ 11,723.19
Profit/(Loss)	$ 88.91	$ 2,188.08	$ 671.04	$ 265.53	$ 1,114.95	$ 851.97	$ 327.08	$ 1,723.19
Winners	80	90	85	95	94	87	87	93
Losers	77	69	71	60	64	64	72	65
Total Trades	158	160	156	156	158	151	160	160
Largest Winner	$ 250.84	$ 230.02	$ 106.83	$ 96.02	$ 202.03	$ 219.19	$ 162.93	$ 284.20
Largest Loser	$ -246.51	$ -263.23	$ -189.62	$ -175.89	$ -132.91	$ -138.23	$ -211.98	$ -110.21
Average Profit/Loss	$ 0.57	$ 13.76	$ 4.30	$ 1.71	$ 7.06	$ 5.64	$ 2.06	$ 10.91

	9	10	11	12	13	14	15	SUMMARY
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	
Trades Made	$ -52,845.41	$ -49,531.69	$ -36,256.17	$ -37,320.05	$ -55,828.75	$ -45,036.29	$ -55,908.61	
Amount Settled	$ 42,846.13	$ 39,540.49	$ 26,265.73	$ 27,320.87	$ 45,830.93	$ 34,477.97	$ 45,379.88	
Closing Cash	$ 0.71	$ 8.79	$ 9.56	$ 0.82	$ 2.18	$ -558.32	$ -528.72	
Outstanding Trades	$ 11,764.73	$ 11,171.01	$ 9,350.97	$ 10,290.41	$ 11,103.39	$ 11,614.50	$ 11,725.15	
Closing Balance	$ 11,765.44	$ 11,179.80	$ 9,360.53	$ 10,291.23	$ 11,105.56	$ 11,056.18	$ 11,196.42	
Profit/(Loss)	$ 1,765.44	$ 1,179.80	$ -639.47	$ 291.23	$ 1,105.56	$ 1,056.18	$ 1,196.42	**$ 903.84**
Winners	83	81	74	81	87	89	91	**89**
Losers	65	79	84	71	64	67	66	**68**
Total Trades	149	160	159	154	153	156	158	**157**
Largest Winner	$ 205.42	$ 192.71	$ 117.65	$ 147.49	$ 173.91	$ 260.37	$ 168.74	**$ 284.20**
Largest Loser	$ -265.52	$ -99.71	$ -169.46	$ -92.80	$ -188.76	$ -171.07	$ -123.35	**$ -263.23**
Average Profit/Loss	$ 11.93	$ 7.37	$ -4.05	$ 1.92	$ 7.32	$ 6.77	$ 7.62	**$ 5.75**

Table 39: Return of Long Only random dates strategy

LONG ONLY RANDOM TRADES 33%

	1	2	3	4	5	6	7	8
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$-129,068.46	$ -43,899.71	$ -67,741.96	$-108,465.93	$ -153,333.00	$ -52,495.58	$ -31,713.77	$-164,116.04
Amount Settled	$ 119,046.70	$ 33,899.71	$ 57,741.96	$ 98,144.38	$ 143,131.19	$ 40,243.19	$ 21,713.77	$ 154,116.04
Closing Cash	$ -21.76	$ -	$ 0.00	$ -321.54	$ -201.81	$ -2,252.39	$ 0.00	$ -0.00
Outstanding Trades	$ 14,295.88	$ 11,435.03	$ 13,296.52	$ 14,792.51	$ 16,238.62	$ 13,800.36	$ 11,833.74	$ 15,827.63
Closing Balance	$ 14,274.12	$ 11,435.03	$ 13,296.52	$ 14,470.97	$ 16,036.81	$ 11,547.97	$ 11,833.74	$ 15,827.63
Profit/(Loss)	$ 4,274.12	$ 1,435.03	$ 3,296.52	$ 4,470.97	$ 6,036.81	$ 1,547.97	$ 1,833.74	$ 5,827.63
Winners	101	99	94	98	117	99	111	97
Losers	59	56	57	58	40	61	49	49
Total Trades	160	155	151	156	158	160	160	146
Largest Winner	$ 684.97	$ 353.63	$ 667.54	$ 520.35	$ 677.56	$ 260.74	$ 497.08	$ 992.39
Largest Loser	$ -585.77	$ -68.89	$ -102.67	$ -200.17	$ -345.76	$ -234.28	$ -94.64	$ -761.49
Average Profit/Loss	$ 26.71	$ 9.26	$ 21.83	$ 28.66	$ 38.45	$ 9.67	$ 11.46	$ 39.92

	9	10	11	12	13	14	15	**SUMMARY**
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	
Trades Made	$ -91,270.60	$ -78,874.86	$ -29,272.63	$ -68,255.90	$ -169,089.02	$ -58,999.92	$ -128,197.85	
Amount Settled	$ 77,925.23	$ 67,689.37	$ 19,272.63	$ 56,293.76	$ 155,020.52	$ 48,999.92	$ 116,539.58	
Closing Cash	$ -3,345.37	$ -1,185.49	$ -0.00	$ -1,962.14	$ -4,068.51	$ 0.00	$ -1,658.27	
Outstanding Trades	$ 16,344.12	$ 14,534.84	$ 11,372.66	$ 14,601.68	$ 17,441.00	$ 14,562.52	$ 16,823.61	
Closing Balance	$ 12,998.75	$ 13,349.35	$ 11,372.66	$ 12,639.54	$ 13,372.49	$ 14,562.52	$ 15,165.34	
Profit/(Loss)	$ 2,998.75	$ 3,349.35	$ 1,372.66	$ 2,639.54	$ 3,372.49	$ 4,562.52	$ 5,165.34	**$ 3,590.35**
Winners	102	113	110	108	98	114	100	**102**
Losers	55	44	49	51	55	45	45	**54**
Total Trades	157	160	160	160	154	159	145	**156**
Largest Winner	$ 806.79	$ 445.08	$ 414.72	$ 673.93	$ 634.27	$ 587.36	$ 606.21	**$ 992.39**
Largest Loser	$ -417.92	$ -104.73	$ -48.37	$ -339.66	$ -535.92	$ -150.58	$ -392.49	**$ -761.49**
Average Profit/Loss	$ 19.10	$ 21.33	$ 8.63	$ 16.60	$ 22.04	$ 28.70	$ 35.62	**$ 23.25**

Table 40: Return of Maximizer random dates strategy

LONG ONLY RANDOM TRADES 75%

	1	2	3	4	5	6	7	8
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
Trades Made	$-203,693.52	$ -38,106.61	$ -76,254.79	$ -91,051.34	$ -107,040.15	$ -154,927.10	$ -34,143.00	$-177,636.30
Amount Settled	$ 193,693.52	$ 27,934.26	$ 65,860.15	$ 80,918.52	$ 97,040.15	$ 144,927.09	$ 24,143.00	$ 165,701.77
Closing Cash	$ -	$ -172.35	$ -394.65	$ -132.82	$ -	$ -0.00	$ -0.00	$ -1,934.53
Outstanding Trades	$ 18,744.25	$ 10,924.99	$ 12,843.69	$ 15,639.21	$ 14,297.84	$ 15,270.40	$ 12,695.02	$ 17,875.50
Closing Balance	$ 18,744.25	$ 10,752.64	$ 12,449.04	$ 15,506.39	$ 14,297.84	$ 15,270.40	$ 12,695.02	$ 15,940.98
Profit/(Loss)	$ 8,744.25	$ 752.64	$ 2,449.04	$ 5,506.39	$ 4,297.84	$ 5,270.40	$ 2,695.02	$ 5,940.98
Winners	98	95	103	107	109	109	103	108
Losers	58	57	57	52	51	51	57	50
Total Trades	157	152	160	160	160	160	160	158
Largest Winner	$ 1,051.84	$ 169.74	$ 347.51	$ 1,594.44	$ 1,014.02	$ 1,694.41	$ 933.41	$ 2,213.96
Largest Loser	$ -601.88	$ -147.85	$ -112.75	$ -222.94	$ -717.25	$ -840.04	$ -76.93	$ -1,180.23
Average Profit/Loss	$ 56.05	$ 4.95	$ 15.31	$ 34.63	$ 26.86	$ 32.94	$ 16.84	$ 39.92

	9	10	11	12	13	14	15	**SUMMARY**
Starting Cash	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	
Trades Made	$-102,887.33	$ -183,669.74	$ -26,235.15	$ -127,246.28	$ -151,626.99	$ -81,581.38	$ -168,446.86	
Amount Settled	$ 92,887.33	$ 172,112.26	$ 16,235.15	$ 117,241.64	$ 141,626.99	$ 67,675.53	$ 158,446.86	
Closing Cash	$ -	$ -1,557.48	$ -	$ -4.64	$ -	$ -3,905.85	$ -	
Outstanding Trades	$ 18,302.50	$ 19,016.24	$ 12,493.54	$ 18,191.55	$ 21,783.21	$ 18,196.53	$ 17,658.70	
Closing Balance	$ 18,302.50	$ 17,458.75	$ 12,493.54	$ 18,186.91	$ 21,783.21	$ 14,290.68	$ 17,658.70	
Profit/(Loss)	$ 8,302.50	$ 7,458.75	$ 2,493.54	$ 8,186.91	$ 11,783.21	$ 4,290.68	$ 7,658.70	**$ 17,167.76**
Winners	99	104	111	102	103	113	116	**104**
Losers	55	51	48	57	47	46	44	**54**
Total Trades	154	155	160	159	151	160	160	**158**
Largest Winner	$ 1,663.85	$ 1,272.31	$ 786.95	$ 2,191.14	$ 3,791.61	$ 1,003.55	$ 2,019.12	**$ 2,213.96**
Largest Loser	$ -261.09	$ -1,611.26	$ -48.14	$ -280.12	$ -526.41	$ -602.41	$ -1,427.25	**$ -1,180.23**
Average Profit/Loss	$ 53.91	$ 48.12	$ 15.68	$ 51.49	$ 78.55	$ 26.99	$ 47.87	**$ 28.44**

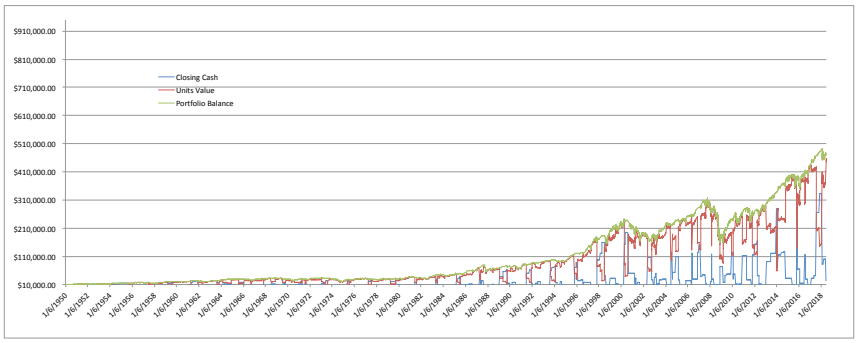

Figure 65: Return of 632-day cycle maximizer strategy

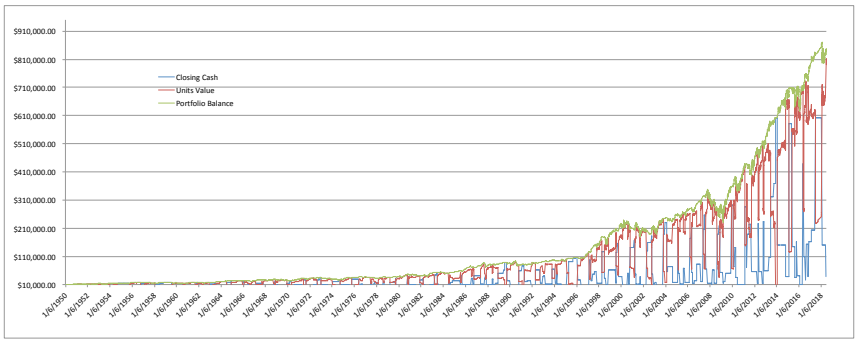

Figure 66: Return of 376-day cycle maximizer strategy

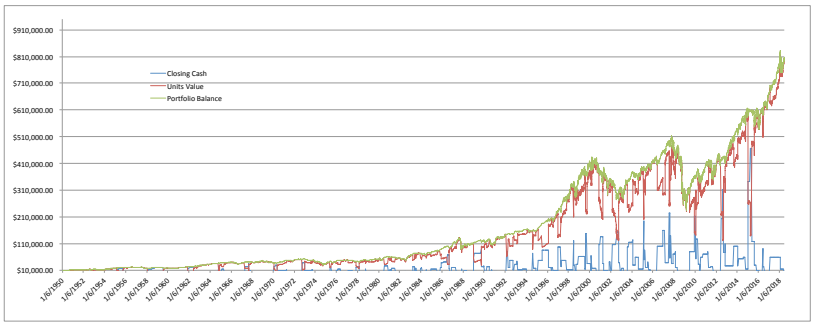

Figure 67: Return of 862-day cycle maximizer strategy

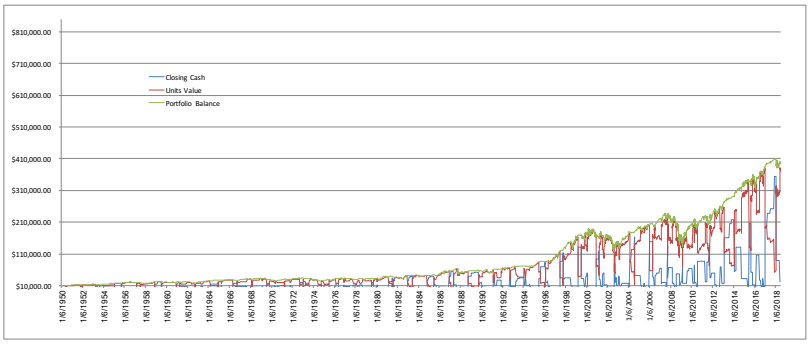

Figure 68: Return of 510-day cycle maximizer strategy

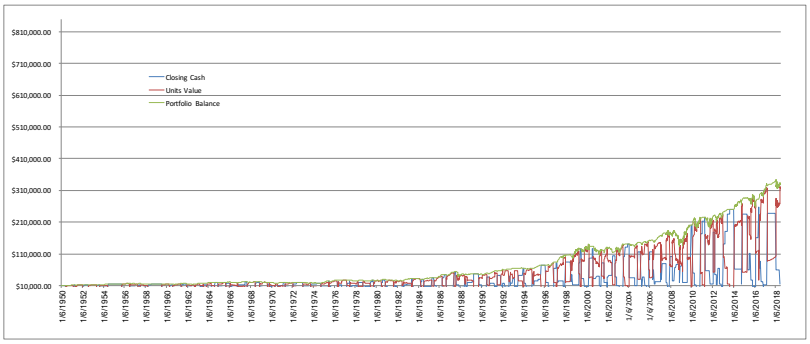

Figure 69: Return of 277-day cycle maximizer strategy

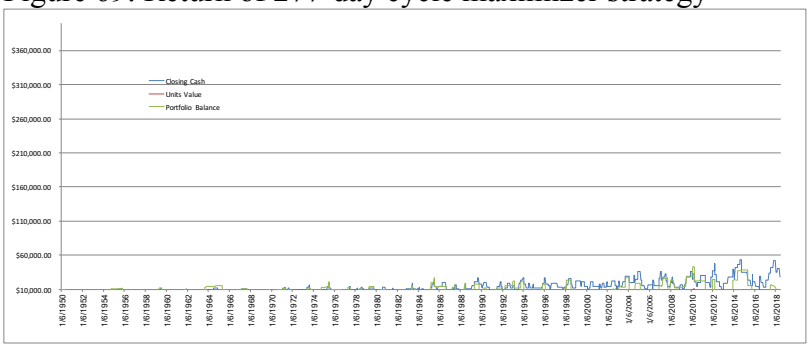

Figure 70: Return of 632-day cycle long/short strategy

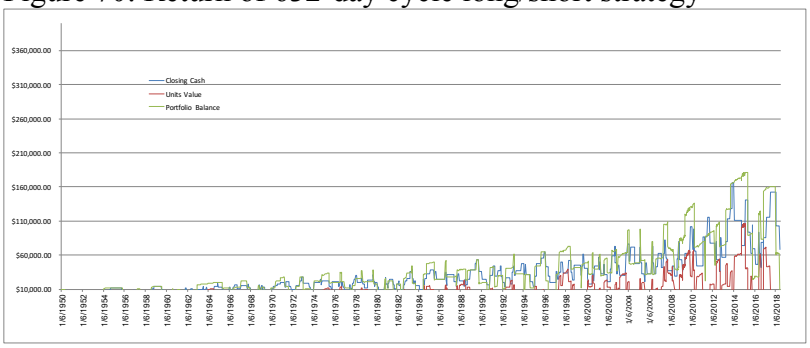

Figure 71: Return of 376-day cycle long/short strategy

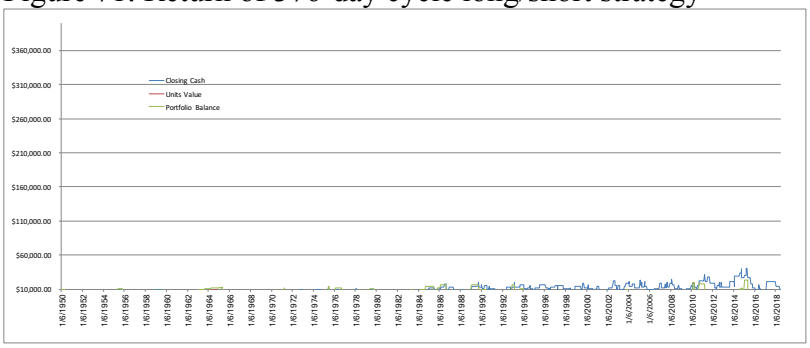

Figure 72: Return of 862-day cycle long/short strategy

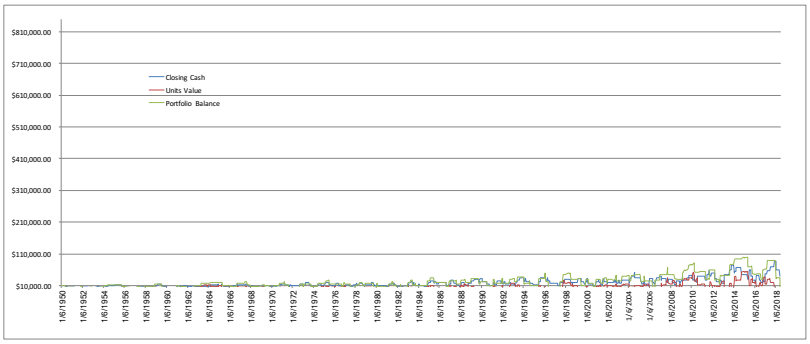

Figure 73: Return of 510-day cycle long/short strategy

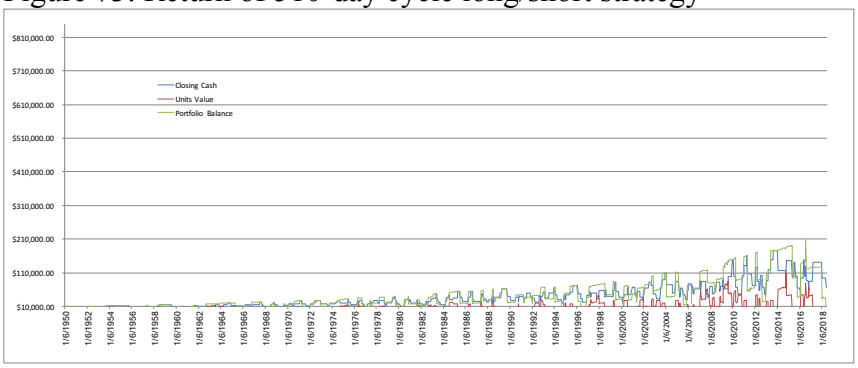

Figure 74: Return of 277-day cycle long/short strategy

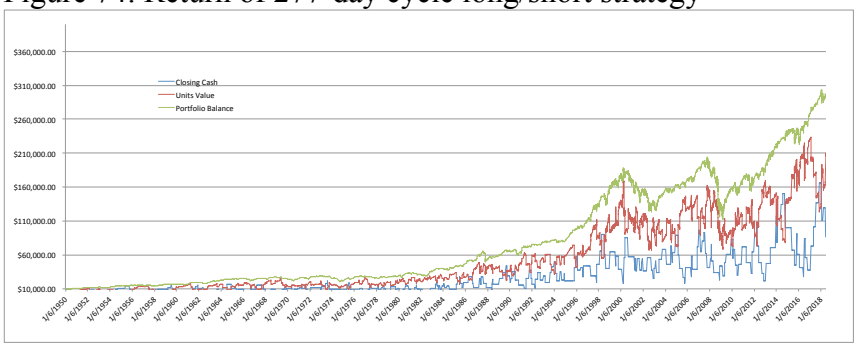

Figure 75: Return of 632-day cycle long only strategy

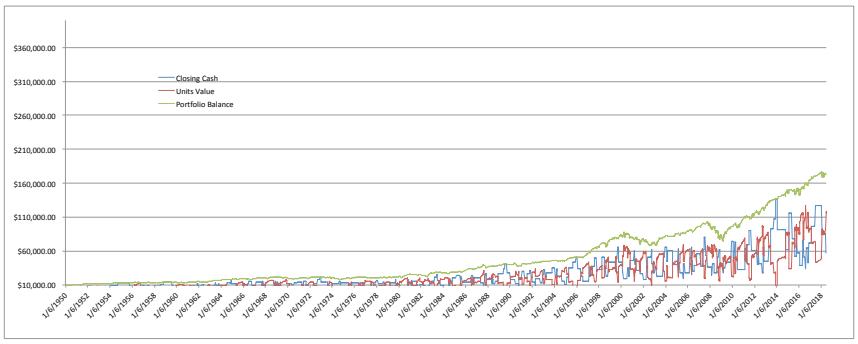

Figure 76: Return of 376-day cycle long only strategy

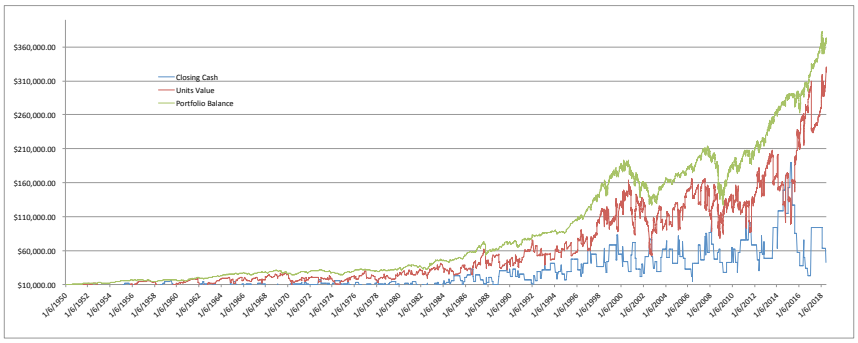

Figure 77: Return of 862-day cycle long only strategy

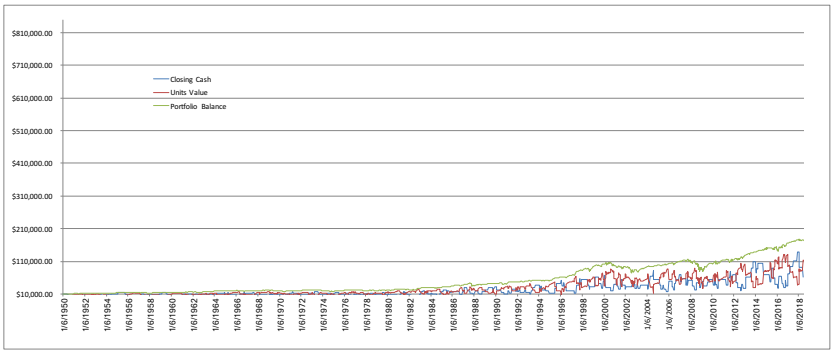

Figure 78: Return of 510-day cycle long only strategy

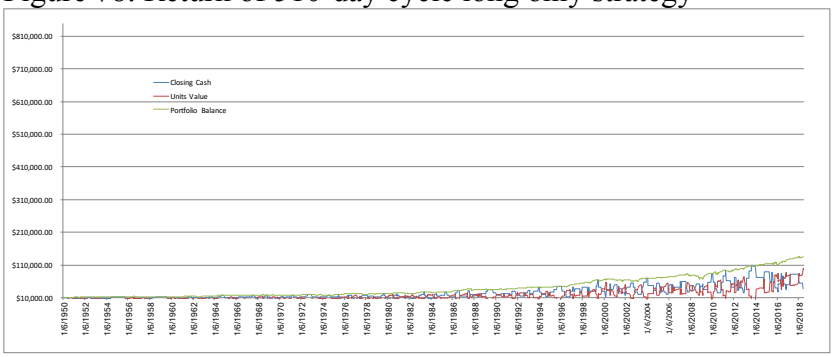

Figure 79: Return of 277-day cycle long only strategy

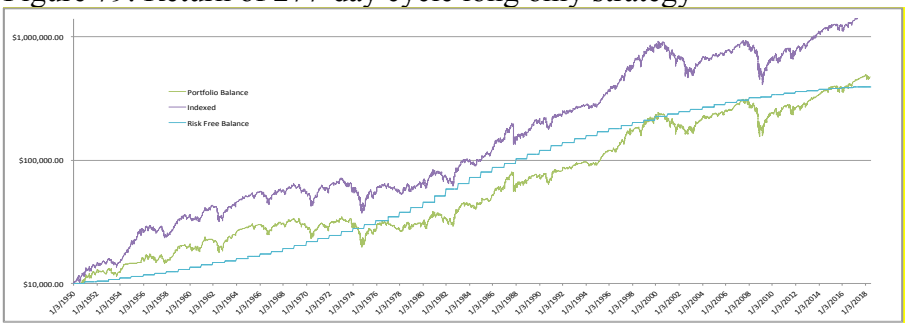

Figure 80: Performance of risk-free strategy against 632-day cycle maximizer strategy

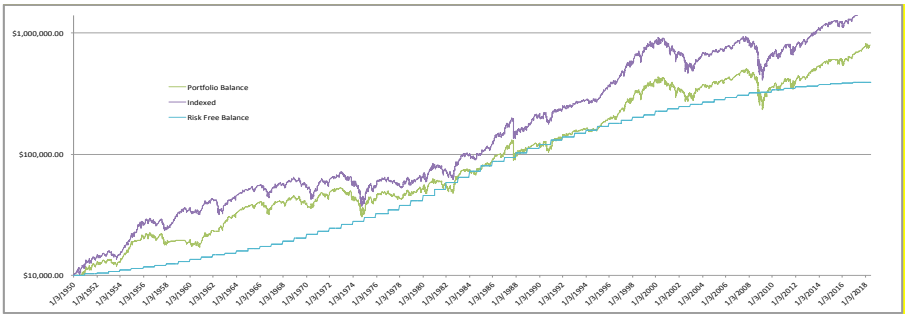

Figure 81: Performance of risk-free strategy against 862-day cycle maximizer strategy

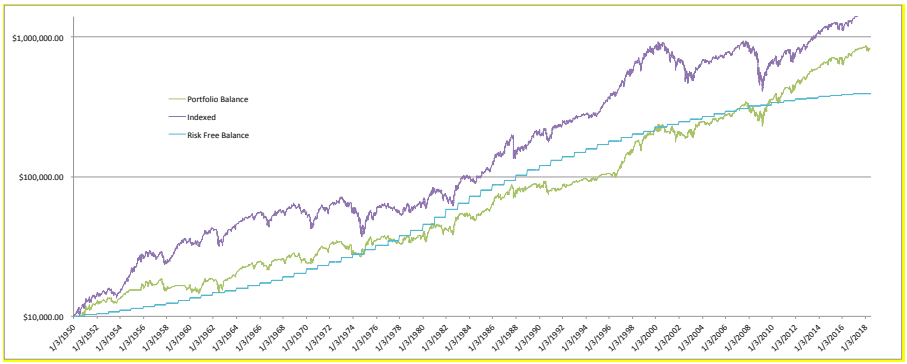

Figure 82: Performance of risk-free strategy against 376-day cycle maximizer strategy

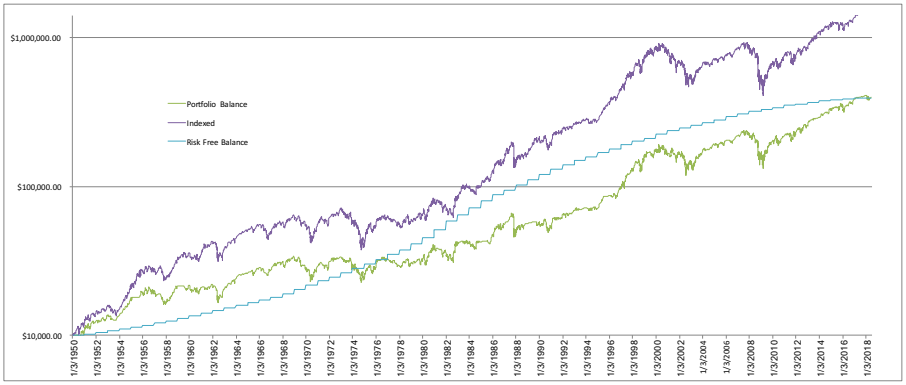

Figure 83: Performance of risk-free strategy against 510-day cycle maximizer strategy

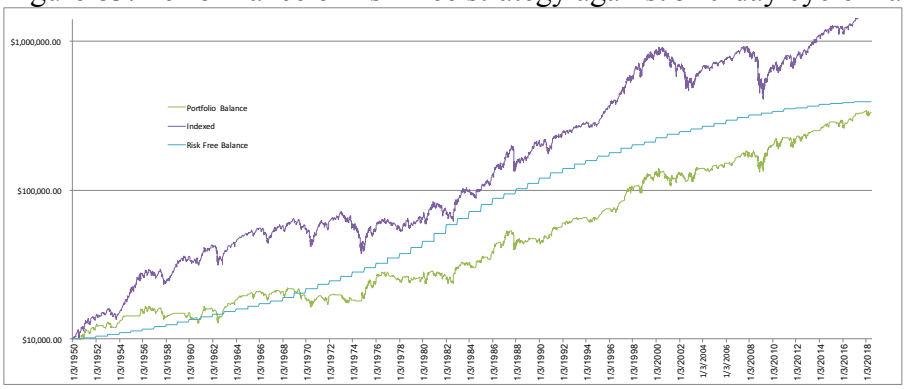

Figure 84: Performance of risk-free strategy against 277-day cycle maximizer strategy

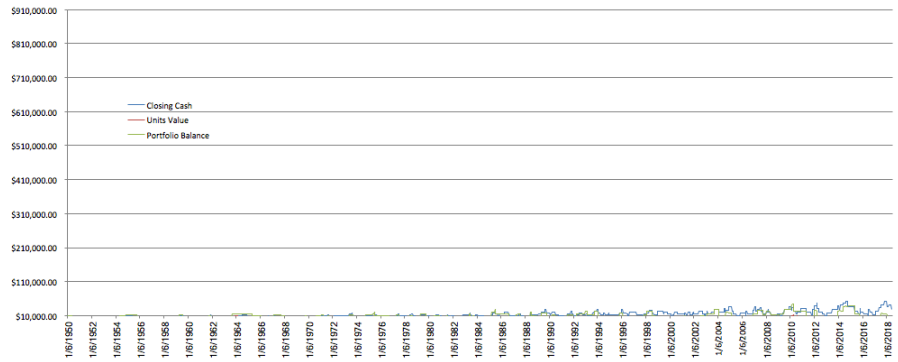

Figure 85: Performance of risk-free strategy against 632-day cycle long/short strategy

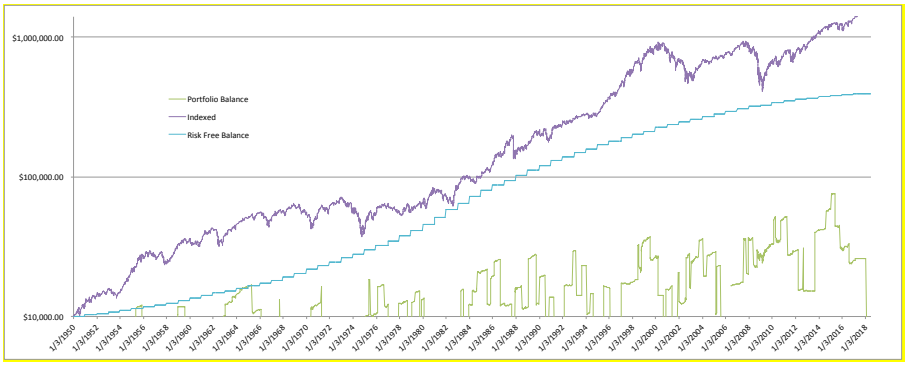

Figure 86: Performance of risk-free strategy against 862-day cycle long/short strategy

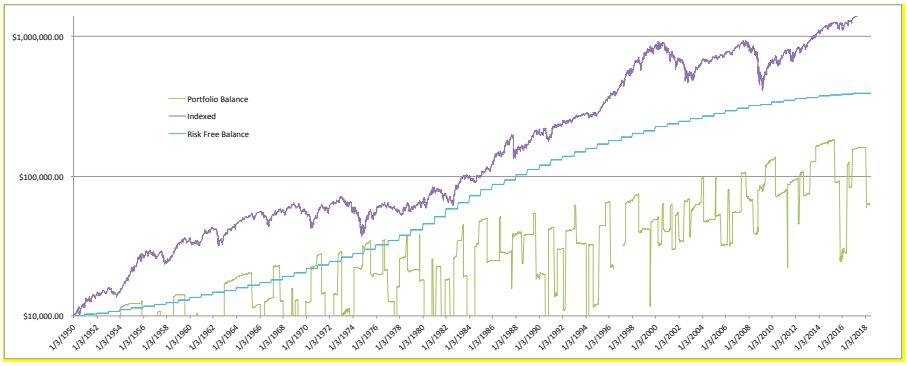

Figure 87: Performance of risk-free strategy against 376-day cycle long/short strategy

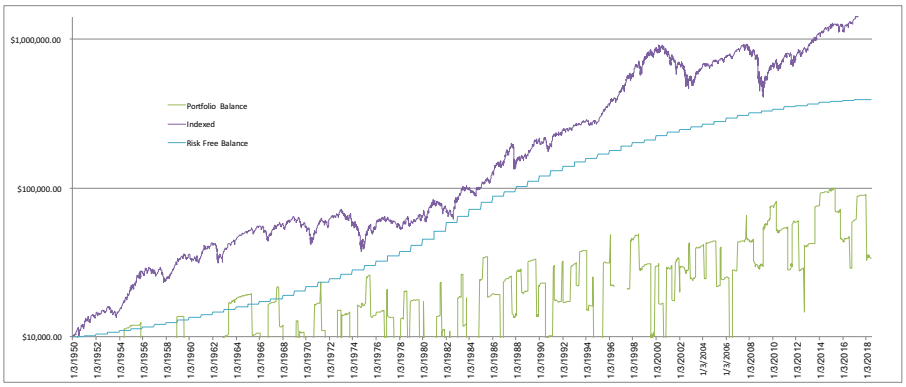

Figure 88: Performance of risk-free strategy against 510-day cycle long/short strategy

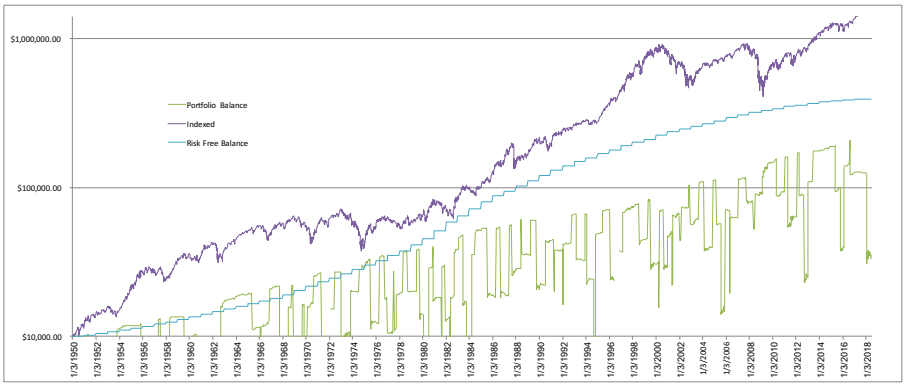

Figure 89: Performance of risk-free strategy against 277-day cycle long/short strategy

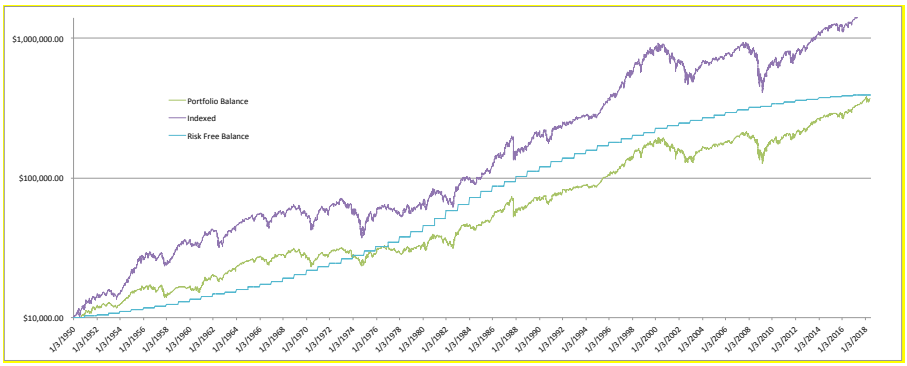

Figure 90: Performance of risk-free strategy against 862-day cycle long only strategy

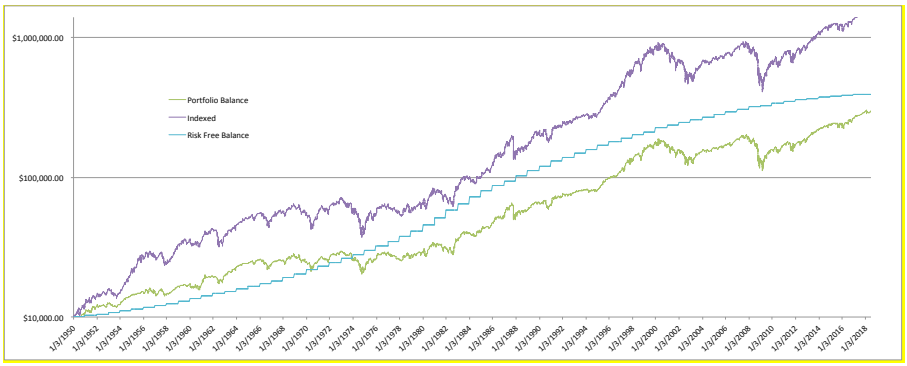

Figure 91: Performance of risk-free strategy against 632-day cycle long only strategy

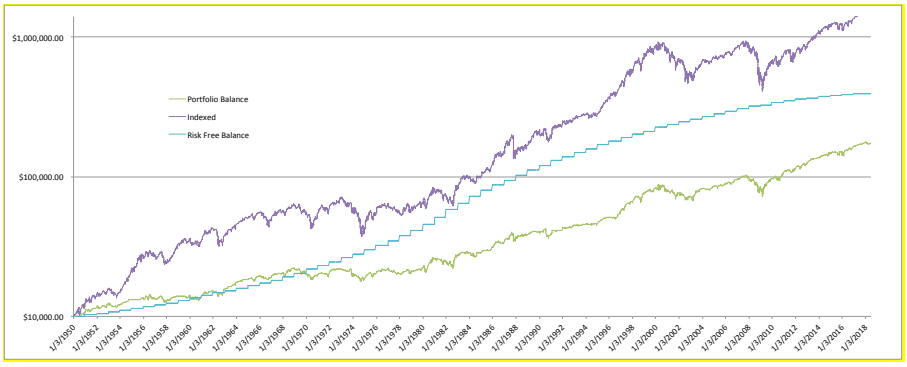

Figure 92: Performance of risk-free strategy against 376-day cycle long only strategy

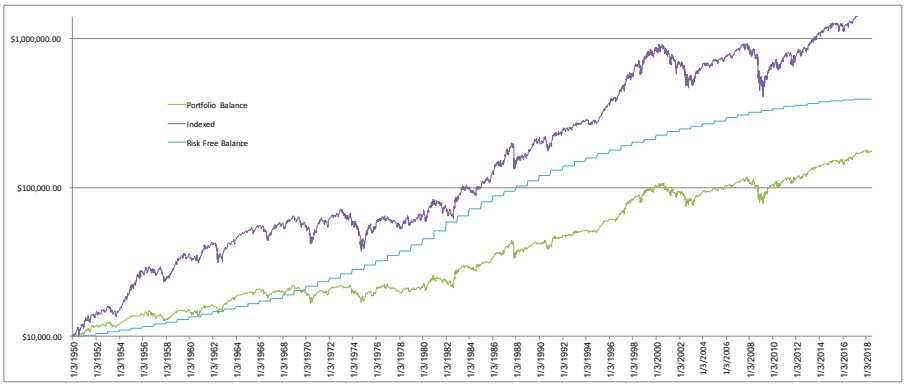

Figure 93: Performance of risk-free strategy against 510-day cycle long only strategy

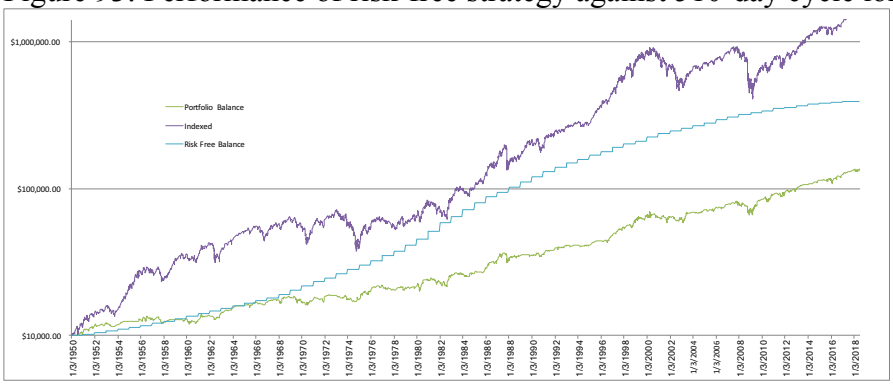

Figure 94: Performance of risk-free strategy against 277-day cycle long only strategy

Table 42: Cycles length selected for the DJIA analysis

	QUARTERLY		
Quarterly Cycle	80.5	46.6	30.6
Sample	67	74	76
Relative Weighting	0.9139	0.9519	0.9485
Combined Weighting	3.192	3.074	3.058
	MONTHLY		
Monthly Cycle	177.0	104.7	62.0
Sample	141	147	153
Relative Weighting	0.9601	0.9537	0.9617
Combined Weighting	1.566	1.487	1.419
	WEEKLY		
Weekly Cycle	348.4	131.1	108.9
Sample	204	234	239
Relative Weighting	0.9492	0.9503	0.9585
Combined Weighting		N/A	

Table 43: Cycles length selected for the S&P 500 analysis

	QUARTERLY		
Quarterly Cycle	124.6	26.7	15.8
Sample	20	27	27
Relative Weighting	0.9359	0.9559	0.9554
Combined Weighting	7.160	5.488	5.520
	MONTHLY		
Monthly Cycle	84.5	52.6	24.0
Sample	88	91	94
Relative Weighting	0.9639	0.9492	0.9492
Combined Weighting	1.676	1.617	1.575
	WEEKLY		
Weekly Cycle	385.8	102.3	215.3
Sample	91	100	95
Relative Weighting	0.9229	0.9160	0.9266
Combined Weighting	1.552	1.429	1.522
	DAILY		
Weekly Cycle	861.9	632.3	376.1
Sample	153	155	156
Relative Weighting	0.7536	0.8721	0.8470
Combined Weighting		N/A	

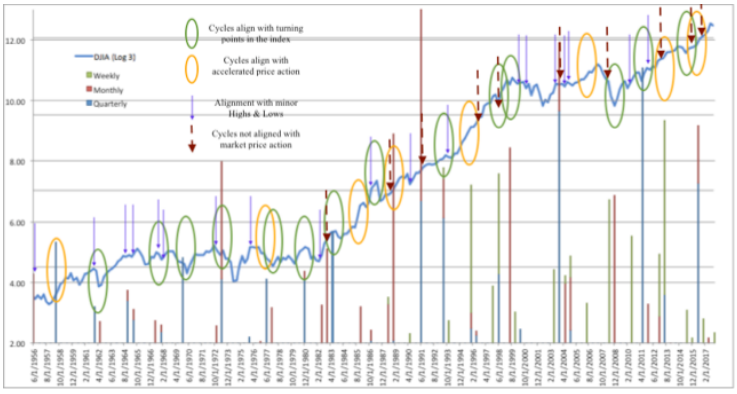

Figure 96: Annotated combined weighted cycle counts for the DJIA with the DJIA index showing intersections with turning points and accelerations of price moves

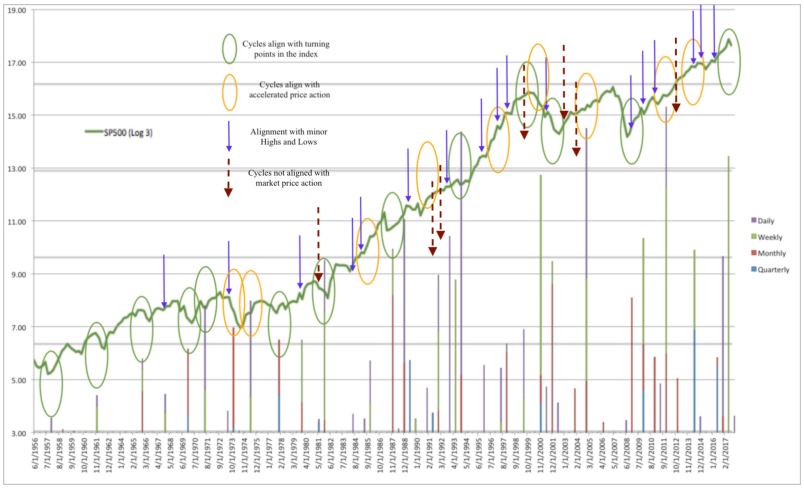

Figure 98: Annotated combined weighted cycle counts for the S&P 500 with the S&P 500 index showing intersections with turning points and accelerations of price moves

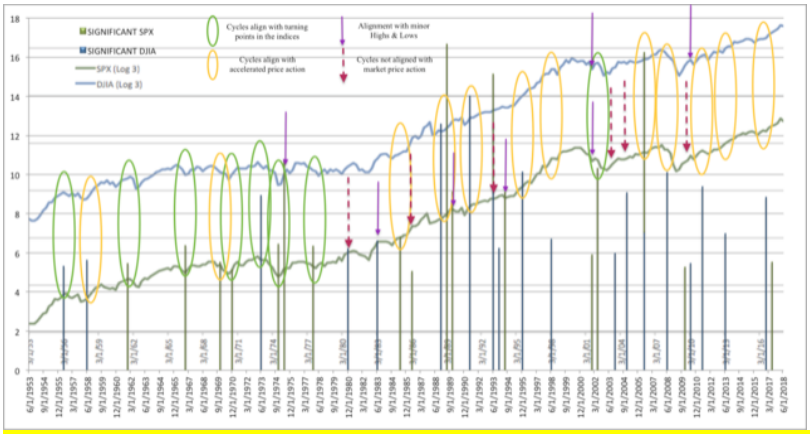

Figure 100: Annotated significant combined DJIA and S&P 500 cycle counts with their respective indices showing intersections with turning points and accelerations of price moves

Table 44: Detail of long trades made under the 854-day Long/Short S&P 500 Strategy

LONG TRADES												
Trade Date	Price	Trade $	Trade Units	Close Date	Price	Close $	W/L	Settled		Settled $		
		$ 328,623.31				$ 103,641.51				$ 432,264.82		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/17/1950	$ 16.68	$ 2,211.00	132.55	11/16/1952	$ 24.75	$ 1,069.71	W	11/17/1952	132.55	$ 3,280.71		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/29/1951	$ 20.96	$ 992.52	47.35	10/29/1953	$ 24.58	$ 171.42	W	10/30/1953	47.35	$ 1,163.94		
11/23/1951	$ 22.40	$ 664.99	29.69	3/25/1954	$ 26.42	$ 119.34	W	3/26/1954	29.69	$ 784.33		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/22/1952	$ 23.80	$ 999.91	42.01	2/22/1955	$ 36.85	$ 548.27	W	2/23/1955	42.01	$ 1,548.19		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/14/1953	$ 22.71	$ 1,647.00	72.52	1/15/1956	$ 44.67	$ 1,592.61	W	1/16/1956	72.52	$ 3,239.62		
10/11/1955	$ 40.80	$ 2,776.47	68.05	2/10/1958	$ 41.48	$ 46.27	W	2/11/1958	68.05	$ 2,822.75		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
5/28/1956	$ 44.10	$ 1,551.34	35.18	9/28/1958	$ 49.66	$ 195.59	W	9/29/1958	35.18	$ 1,746.93		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/12/1957	$ 42.39	$ 466.59	11.01	6/15/1959	$ 56.99	$ 160.70	W	6/16/1959	11.01	$ 627.29		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/22/1957	$ 38.98	$ 209.45	5.37	2/22/1960	$ 56.24	$ 92.74	W	2/23/1960	5.37	$ 302.19		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/22/1959	$ 55.14	$ 2,590.46	46.98	1/22/1962	$ 68.81	$ 642.21	W	1/23/1962	46.98	$ 3,232.67		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/8/1960	$ 53.47	$ 1,320.84	24.70	7/9/1962	$ 56.55	$ 76.08	W	7/10/1962	24.70	$ 1,396.92		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/25/1960	$ 52.20	$ 592.92	11.36	2/25/1963	$ 65.46	$ 150.62	W	2/26/1963	11.36	$ 743.54		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/26/1962	$ 52.32	$ 2,489.46	47.58	10/26/1964	$ 85.00	$ 1,554.96	W	10/27/1964	47.58	$ 4,044.42		
10/23/1962	$ 53.49	$ 2,128.92	39.80	2/22/1965	$ 86.21	$ 1,302.27	W	2/23/1965	39.80	$ 3,431.19		
7/22/1963	$ 67.90	$ 1,940.85	28.58	11/21/1965	$ 92.24	$ 695.73	W	11/22/1965	28.58	$ 2,636.58		
11/22/1963	$ 69.61	$ 1,426.10	20.49	3/24/1966	$ 89.29	$ 403.18	W	3/25/1966	20.49	$ 1,829.29		
12/15/1964	$ 83.22	$ 2,679.84	32.20	4/17/1967	$ 91.07	$ 252.78	W	4/18/1967	32.20	$ 2,932.62		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/28/1965	$ 81.60	$ 1,961.62	24.04	10/29/1967	$ 94.96	$ 321.17	W	10/30/1967	24.04	$ 2,282.78		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/7/1966	$ 73.20	$ 2,067.18	28.24	2/6/1969	$ 103.54	$ 856.81	W	2/7/1969	28.24	$ 2,923.99		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/8/1967	$ 91.14	$ 2,935.99	32.21	3/10/1970	$ 88.75	$ -76.99	L	3/11/1970	32.21	$ 2,859.00		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/5/1968	$ 87.72	$ 1,317.97	15.02	7/6/1970	$ 71.78	$ -239.49	L	7/7/1970	15.02	$ 1,078.47		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/25/1969	$ 97.98	$ 2,000.49	20.42	6/28/1971	$ 97.74	$ -4.90	L	6/29/1971	20.42	$ 1,995.59		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/29/1969	$ 89.48	$ 898.02	10.04	11/29/1971	$ 93.41	$ 39.44	W	11/30/1971	10.04	$ 937.46		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
5/26/1970	$ 69.29	$ 3,304.16	47.69	9/25/1972	$ 108.05	$ 1,848.31	W	9/26/1972	47.69	$ 5,152.47		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/23/1971	$ 90.16	$ 2,311.31	25.64	3/25/1974	$ 97.64	$ 191.75	W	3/26/1974	25.64	$ 2,503.06		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/22/1973	$ 100.53	$ 2,503.46	24.90	12/23/1975	$ 88.73	$ -293.85	L	12/24/1975	24.90	$ 2,209.61		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/3/1974	$ 62.28	$ 3,603.81	57.86	2/2/1977	$ 102.36	$ 2,319.22	W	2/3/1977	57.86	$ 5,923.03		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/16/1975	$ 82.09	$ 2,636.07	32.11	1/16/1978	$ 89.43	$ 235.70	W	1/17/1978	32.11	$ 2,871.77		
6/7/1976	$ 98.63	$ 3,484.24	35.33	10/8/1978	$ 103.52	$ 172.75	W	10/9/1978	35.33	$ 3,656.98		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/10/1976	$ 98.81	$ 1,564.07	15.83	3/13/1979	$ 99.84	$ 16.30	W	3/14/1979	15.83	$ 1,580.38		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/6/1978	$ 86.90	$ 4,029.98	46.37	7/6/1980	$ 117.46	$ 1,417.22	W	7/7/1980	46.37	$ 5,447.20		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/14/1978	$ 92.49	$ 3,015.86	32.61	3/16/1981	$ 134.68	$ 1,375.71	W	3/17/1981	32.61	$ 4,391.57		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/7/1979	$ 99.87	$ 2,501.22	25.04	3/9/1982	$ 108.83	$ 224.40	W	3/10/1982	25.04	$ 2,725.63		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/27/1980	$ 98.22	$ 1,696.12	17.27	7/28/1982	$ 107.74	$ 164.40	W	7/29/1982	17.27	$ 1,860.52		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/20/1981	$ 126.58	$ 2,635.85	20.82	6/23/1983	$ 170.57	$ 916.03	W	6/24/1983	20.82	$ 3,551.88		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/25/1981	$ 112.77	$ 2,154.21	19.10	1/26/1984	$ 164.24	$ 983.21	W	1/27/1984	19.10	$ 3,137.42		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/8/1982	$ 107.34	$ 2,141.95	19.95	7/8/1984	$ 152.24	$ 895.97	W	7/9/1984	19.95	$ 3,037.92		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/12/1982	$ 102.42	$ 3,075.25	30.03	12/12/1984	$ 162.63	$ 1,807.86	W	12/13/1984	30.03	$ 4,883.10		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/8/1983	$ 159.18	$ 3,143.87	19.75	12/8/1985	$ 202.99	$ 865.27	W	12/9/1985	19.75	$ 4,009.14		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/23/1984	$ 154.29	$ 3,255.82	21.10	6/25/1986	$ 248.93	$ 1,997.09	W	6/26/1986	21.10	$ 5,252.91		
7/24/1984	$ 147.82	$ 3,536.45	23.92	11/24/1986	$ 247.45	$ 2,383.55	W	11/25/1986	23.92	$ 5,920.01		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/25/1985	$ 180.66	$ 2,983.82	16.52	1/26/1988	$ 249.57	$ 1,138.13	W	1/27/1988	16.52	$ 4,121.95		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/29/1986	$ 229.91	$ 4,325.74	18.81	1/29/1989	$ 293.82	$ 1,202.46	W	1/30/1989	18.81	$ 5,528.21		
5/20/1987	$ 278.21	$ 4,851.85	17.44	9/19/1989	$ 346.55	$ 1,191.82	W	9/20/1989	17.44	$ 6,043.67		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
12/4/1987	$ 223.92	$ 3,291.66	14.70	4/5/1990	$ 340.73	$ 1,717.13	W	4/6/1990	14.70	$ 5,008.79		
5/23/1988	$ 250.83	$ 3,565.66	14.22	9/23/1990	$ 311.32	$ 859.89	W	9/24/1990	14.22	$ 4,425.55		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/30/1990	$ 322.98	$ 5,953.30	18.43	6/1/1992	$ 417.30	$ 1,738.55	W	6/2/1992	18.43	$ 7,691.85		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/11/1990	$ 295.46	$ 5,240.31	17.74	2/10/1993	$ 446.23	$ 2,674.08	W	2/11/1993	17.74	$ 7,914.39		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/29/1991	$ 375.22	$ 2,806.31	7.48	3/31/1994	$ 445.77	$ 527.65	W	4/4/1994	7.48	$ 3,333.97		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/8/1992	$ 394.50	$ 3,335.27	8.45	8/9/1994	$ 457.92	$ 536.18	W	8/10/1994	8.45	$ 3,871.45		
10/9/1992	$ 402.66	$ 4,772.94	11.85	2/9/1995	$ 480.19	$ 919.00	W	2/10/1995	11.85	$ 5,691.94		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/4/1994	$ 438.92	$ 4,099.95	9.34	8/4/1996	$ 662.49	$ 2,088.36	W	8/5/1996	9.34	$ 6,188.31		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
12/8/1994	$ 445.45	$ 3,821.04	8.58	4/9/1997	$ 760.60	$ 2,703.34	W	4/10/1997	8.58	$ 6,524.38		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/24/1996	$ 626.65	$ 4,073.31	6.50	11/24/1998	$ 1,182.99	$ 3,616.29	W	11/25/1998	6.50	$ 7,689.60		
4/11/1997	$ 737.65	$ 7,708.19	10.45	8/12/1999	$ 1,298.16	$ 5,857.14	W	8/13/1999	10.45	$ 13,565.33		
10/27/1997	$ 876.99	$ 5,164.49	5.89	2/27/2000	$ 1,333.36	$ 2,687.51	W	2/28/2000	5.89	$ 7,852.00		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/31/1998	$ 957.28	$ 2,794.22	2.92	12/31/2000	$ 1,320.28	$ 1,059.57	W	1/2/2001	2.92	$ 3,853.79		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/15/1999	$ 1,247.41	$ 7,867.07	6.31	2/14/2002	$ 1,116.48	$ -825.74	L	2/15/2002	6.31	$ 7,041.33		
2/25/2000	$ 1,333.36	$ 5,270.94	3.95	6/27/2002	$ 990.64	$ -1,354.81	L	6/28/2002	3.95	$ 3,916.12		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/4/2001	$ 1,103.25	$ 5,181.28	4.70	8/5/2003	$ 965.46	$ -647.11	L	8/6/2003	4.70	$ 4,534.17		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/21/2001	$ 965.80	$ 2,325.88	2.41	1/22/2004	$ 1,143.94	$ 429.00	W	1/23/2004	2.41	$ 2,754.88		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/9/2002	$ 776.76	$ 8,928.58	11.49	2/8/2005	$ 1,202.30	$ 4,891.43	W	2/9/2005	11.49	$ 13,820.02		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/11/2003	$ 800.73	$ 5,906.31	7.38	7/11/2005	$ 1,219.44	$ 3,088.47	W	7/12/2005	7.38	$ 8,994.78		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/12/2004	$ 1,063.23	$ 6,423.44	6.04	12/13/2006	$ 1,413.21	$ 2,114.38	W	12/14/2006	6.04	$ 8,537.83		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/20/2005	$ 1,137.50	$ 7,436.97	6.54	8/21/2007	$ 1,447.12	$ 2,024.29	W	8/22/2007	6.54	$ 9,461.27		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/13/2005	$ 1,176.84	$ 5,327.20	4.53	2/13/2008	$ 1,367.21	$ 861.75	W	2/14/2008	4.53	$ 6,188.95		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/13/2006	$ 1,223.69	$ 2,391.38	1.95	10/13/2008	$ 1,003.35	$ -430.60	L	10/14/2008	1.95	$ 1,960.78		
3/5/2007	$ 1,374.12	$ 6,831.41	4.97	7/5/2009	$ 896.42	$ -2,374.88	L	7/6/2009	4.97	$ 4,456.54		
8/15/2007	$ 1,406.70	$ 6,773.82	4.82	12/15/2009	$ 1,107.93	$ -1,438.70	L	12/16/2009	4.82	$ 5,335.13		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/10/2008	$ 1,273.37	$ 9,339.96	7.33	7/11/2010	$ 1,077.96	$ -1,433.30	L	7/12/2010	7.33	$ 7,906.66		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/20/2008	$ 752.44	$ 6,096.62	8.10	3/23/2011	$ 1,297.54	$ 4,416.65	W	3/24/2011	8.10	$ 10,513.27		
3/9/2009	$ 676.53	$ 4,084.74	6.04	7/10/2011	$ 1,343.80	$ 4,028.83	W	7/11/2011	6.04	$ 8,113.56		
2/8/2010	$ 1,056.74	$ 5,968.02	5.65	6/10/2012	$ 1,325.66	$ 1,518.75	W	6/11/2012	5.65	$ 7,486.77		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/2/2010	$ 1,022.58	$ 4,923.01	4.81	11/1/2012	$ 1,427.59	$ 1,949.84	W	11/2/2012	4.81	$ 6,872.85		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/3/2011	$ 1,099.23	$ 10,635.62	9.68	2/2/2014	$ 1,782.59	$ 6,611.86	W	2/3/2014	9.68	$ 17,247.47		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/1/2012	$ 1,278.04	$ 4,774.33	3.74	10/2/2014	$ 1,946.17	$ 2,495.91	W	10/3/2014	3.74	$ 7,270.24		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/15/2012	$ 1,353.33	$ 7,444.52	5.50	3/18/2015	$ 2,099.50	$ 4,104.60	W	3/19/2015	5.50	$ 11,549.12		
2/3/2014	$ 1,741.89	$ 8,118.29	4.66	6/5/2016	$ 2,099.13	$ 1,664.96	W	6/6/2016	4.66	$ 9,783.25		
10/15/2014	$ 1,862.49	$ 15,042.94	8.08	2/14/2017	$ 2,337.58	$ 3,837.20	W	2/15/2017	8.08	$ 18,880.15		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/25/2015	$ 1,867.61	$ 10,400.47	5.57	12/25/2017	$ 2,683.34	$ 4,542.69	W	12/26/2017	5.57	$ 14,943.16		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/11/2016	$ 1,829.08	$ 4,668.77	2.55	6/13/2018	$ 2,775.63	$ 2,416.09	W	1/0/1900	2.55	$ 7,084.86		
6/27/2016	$ 2,000.54	$ 6,356.55	3.18	10/28/2018	$ 2,717.07	$ 2,276.71	W	1/0/1900	3.18	$ 8,633.26		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/4/2016	$ 2,085.18	$ 2,853.45	1.37	3/7/2019	$ 2,717.07	$ 864.71	W	1/0/1900	1.37	$ 3,718.16		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		

Table 45: Detail of short trades made under the 854-day Long/Short S&P 500 Strategy

SHORT TRADES											
Trade Date	Price	Trade $	Trade Units	Close Date	Price	Close $	W/L	Settled		Settled $	
		$ 296,217.24				$ -33,052.78				$ 263,164.46	
6/12/1950	$ 19.40	$ 3,300.00	170.10	10/12/1952	$ 24.55	$ -876.03	L	10/14/1952	170.10	$ 2,423.97	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/3/1951	$ 22.81	$ 1,481.37	64.94	9/2/1953	$ 23.56	$ -48.71	L	9/3/1953		$ 1,432.66	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/22/1952	$ 24.66	$ 445.54	18.07	5/24/1954	$ 29.00	$ -78.41	L	5/25/1954		$ 367.13	
8/8/1952	$ 25.55	$ 298.51	11.68	12/9/1954	$ 34.69	$ -106.79	L	12/10/1954		$ 191.73	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/5/1953	$ 26.66	$ 1,752.58	65.74	5/8/1955	$ 37.89	$ -738.24	L	5/9/1955		$ 1,014.34	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/14/1955	$ 46.41	$ 1,860.24	40.08	3/16/1958	$ 42.33	$ 163.54	W	3/17/1958		$ 2,023.78	
3/20/1956	$ 48.87	$ 2,315.43	47.38	7/21/1958	$ 46.33	$ 120.34	W	7/22/1958		$ 2,435.78	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/2/1956	$ 49.64	$ 1,039.40	20.94	12/3/1958	$ 52.53	$ -60.51	L	12/4/1958		$ 978.89	
8/3/1956	$ 49.64	$ 696.40	14.03	12/4/1958	$ 52.55	$ -40.82	L	12/5/1958		$ 655.57	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/15/1957	$ 49.13	$ 312.61	6.36	11/15/1959	$ 56.85	$ -49.12	L	11/16/1959		$ 263.49	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/3/1959	$ 60.71	$ 3,866.35	63.69	12/3/1961	$ 71.78	$ -705.00	L	12/4/1961		$ 3,161.35	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/5/1960	$ 60.39	$ 1,822.56	30.18	5/7/1962	$ 66.02	$ -169.91	L	5/8/1962		$ 1,652.65	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/24/1960	$ 58.07	$ 884.96	15.24	12/25/1962	$ 62.63	$ -69.49	L	12/26/1962		$ 815.47	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
4/17/1961	$ 68.68	$ 397.26	5.78	8/18/1963	$ 71.49	$ -16.25	L	8/19/1963		$ 381.01	
12/12/1961	$ 72.64	$ 1,309.41	18.03	4/13/1964	$ 79.77	$ -128.53	L	4/14/1964		$ 1,180.88	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/13/1965	$ 90.27	$ 2,927.78	32.43	9/13/1967	$ 95.99	$ -185.52	L	9/14/1967		$ 2,742.26	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
2/9/1966	$ 94.06	$ 2,184.35	23.22	6/11/1968	$ 101.66	$ -176.49	L	6/13/1968		$ 2,007.86	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
9/25/1967	$ 97.59	$ 3,257.72	33.38	1/25/1970	$ 89.37	$ 274.40	W	1/26/1970		$ 3,532.12	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/12/1968	$ 96.72	$ 1,967.12	20.34	5/14/1970	$ 75.44	$ 432.80	W	5/15/1970		$ 2,399.91	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/29/1968	$ 108.37	$ 1,545.63	14.26	4/1/1971	$ 100.39	$ 113.82	W	4/2/1971		$ 1,659.45	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/14/1969	$ 106.16	$ 1,340.33	12.63	9/14/1971	$ 99.34	$ 86.11	W	9/15/1971		$ 1,426.43	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/10/1969	$ 98.33	$ 601.67	6.12	3/12/1972	$ 108.38	$ -61.50	L	3/13/1972		$ 540.18	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
4/28/1971	$ 104.77	$ 3,117.30	29.75	8/28/1973	$ 103.02	$ 52.07	W	8/29/1973		$ 3,169.37	
9/8/1971	$ 101.34	$ 2,747.14	27.11	1/8/1974	$ 96.12	$ 141.50	W	1/9/1974		$ 2,888.64	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/11/1973	$ 120.24	$ 3,736.51	31.08	5/14/1975	$ 92.27	$ 869.18	W	5/15/1975		$ 4,605.69	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
10/12/1973	$ 111.44	$ 2,723.21	24.44	2/12/1976	$ 100.25	$ 273.45	W	2/13/1976		$ 2,996.66	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/15/1975	$ 95.61	$ 3,934.43	41.15	11/14/1977	$ 95.32	$ 11.93	W	11/15/1977		$ 3,946.37	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
9/21/1976	$ 107.83	$ 2,334.44	21.65	1/22/1979	$ 99.90	$ 171.68	W	1/23/1979		$ 2,506.12	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
12/31/1976	$ 107.46	$ 1,047.93	9.75	5/3/1979	$ 101.81	$ 55.10	W	5/4/1979		$ 1,103.03	
7/19/1977	$ 101.79	$ 2,656.71	26.10	11/19/1979	$ 104.23	$ -63.68	L	11/20/1979		$ 2,593.03	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
9/12/1978	$ 106.99	$ 2,700.09	25.24	1/12/1981	$ 133.52	$ -669.53	L	1/13/1981		$ 2,030.56	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
10/5/1979	$ 111.27	$ 3,733.17	33.55	2/4/1982	$ 116.42	$ -172.79	L	2/5/1982		$ 3,560.39	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
2/13/1980	$ 118.44	$ 2,531.52	21.37	6/15/1982	$ 109.69	$ 187.02	W	6/16/1982		$ 2,718.54	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/28/1980	$ 140.52	$ 2,933.98	20.88	3/31/1983	$ 152.96	$ -259.74	L	4/4/1983		$ 2,674.24	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/11/1981	$ 133.85	$ 3,215.24	24.02	12/12/1983	$ 165.62	$ -763.15	L	12/13/1983		$ 2,452.08	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/30/1981	$ 126.35	$ 1,443.32	11.42	4/1/1984	$ 159.18	$ -375.02	L	4/2/1984		$ 1,068.30	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/7/1982	$ 119.47	$ 2,334.56	19.54	9/6/1984	$ 165.65	$ -902.40	L	9/7/1984		$ 1,432.16	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
6/22/1983	$ 170.99	$ 2,942.91	17.21	10/22/1985	$ 188.04	$ -293.45	L	10/23/1985		$ 2,649.47	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
10/10/1983	$ 172.65	$ 2,106.39	12.20	2/9/1986	$ 214.56	$ -511.32	L	2/10/1986		$ 1,595.08	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/17/1985	$ 195.65	$ 4,453.46	22.76	11/17/1987	$ 243.04	$ -1,078.71	L	11/18/1987		$ 3,374.75	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
9/4/1986	$ 253.83	$ 6,456.33	25.44	1/4/1989	$ 279.43	$ -651.15	L	1/5/1989		$ 5,805.18	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/25/1987	$ 336.77	$ 3,250.74	9.65	12/25/1989	$ 347.42	$ -102.80	L	12/26/1989		$ 3,147.94	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/5/1988	$ 275.81	$ 2,388.99	8.66	11/5/1990	$ 314.59	$ -335.90	L	11/6/1990		$ 2,053.09	
10/9/1989	$ 359.80	$ 7,335.05	20.39	2/9/1992	$ 411.09	$ -1,045.62	L	2/10/1992		$ 6,289.43	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/16/1990	$ 368.95	$ 5,641.62	15.29	11/15/1992	$ 422.43	$ -817.76	L	11/16/1992		$ 4,823.85	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
4/17/1991	$ 390.45	$ 4,188.53	10.73	8/17/1993	$ 453.13	$ -672.40	L	8/18/1993		$ 3,516.13	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/15/1992	$ 420.77	$ 1,880.23	4.47	5/17/1994	$ 449.37	$ -127.80	L	5/18/1994		$ 1,752.43	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
3/10/1993	$ 456.33	$ 7,401.49	16.22	7/11/1995	$ 554.78	$ -1,596.82	L	7/12/1995		$ 5,804.67	
2/2/1994	$ 482.00	$ 6,119.32	12.70	6/4/1996	$ 672.56	$ -2,419.29	L	6/5/1996		$ 3,700.03	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/30/1994	$ 476.07	$ 5,703.05	11.98	12/30/1996	$ 753.85	$ -3,327.65	L	12/31/1996		$ 2,375.40	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
2/12/1996	$ 661.45	$ 6,353.98	9.61	6/14/1998	$ 1,098.84	$ -4,201.63	L	6/15/1998		$ 2,152.35	
5/24/1996	$ 678.51	$ 4,257.17	6.27	9/24/1998	$ 1,042.72	$ -2,285.16	L	9/25/1998		$ 1,972.01	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/17/1998	$ 1,186.75	$ 4,170.48	3.51	11/16/2000	$ 1,372.32	$ -652.13	L	11/17/2000		$ 3,518.35	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
7/16/1999	$ 1,418.78	$ 5,060.46	3.57	11/15/2001	$ 1,142.24	$ 986.35	W	11/16/2001		$ 6,046.82	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
3/24/2000	$ 1,527.46	$ 6,122.69	4.01	7/25/2002	$ 838.68	$ 2,760.91	W	7/26/2002		$ 8,883.60	
9/1/2000	$ 1,520.77	$ 4,102.20	2.70	1/2/2003	$ 909.03	$ 1,650.14	W	1/3/2003		$ 5,752.34	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/21/2001	$ 1,312.83	$ 3,471.46	2.64	9/21/2003	$ 1,036.30	$ 731.22	W	9/22/2003		$ 4,202.67	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/4/2002	$ 1,172.51	$ 3,553.79	3.03	5/6/2004	$ 1,113.99	$ 177.37	W	5/7/2004		$ 3,731.16	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/27/2002	$ 938.87	$ 5,982.15	6.37	3/29/2005	$ 1,165.36	$ -1,443.11	L	3/30/2005		$ 4,539.04	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
2/11/2004	$ 1,157.76	$ 7,749.50	6.69	6/13/2006	$ 1,223.69	$ -441.30	L	6/14/2006		$ 7,308.19	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
3/7/2005	$ 1,225.31	$ 8,864.31	7.23	7/8/2007	$ 1,530.44	$ -2,207.41	L	7/9/2007		$ 6,656.90	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/3/2005	$ 1,245.04	$ 7,951.05	6.39	12/4/2007	$ 1,462.79	$ -1,390.59	L	12/5/2007		$ 6,560.46	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/5/2006	$ 1,325.76	$ 3,569.23	2.69	9/4/2008	$ 1,236.83	$ 239.42	W	9/5/2008		$ 3,808.64	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
10/9/2007	$ 1,565.15	$ 7,660.68	4.89	2/8/2010	$ 1,056.74	$ 2,488.43	W	2/9/2010		$ 10,149.11	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/19/2008	$ 1,426.63	$ 6,257.77	4.39	9/19/2010	$ 1,125.59	$ 1,320.48	W	9/20/2010		$ 7,578.26	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
4/23/2010	$ 1,217.28	$ 7,347.78	6.04	8/23/2012	$ 1,402.08	$ -1,115.49	L	8/24/2012		$ 6,232.29	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
4/29/2011	$ 1,363.61	$ 11,877.82	8.71	8/29/2013	$ 1,638.17	$ -2,391.57	L	8/30/2013		$ 9,486.25	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
4/2/2012	$ 1,419.04	$ 7,125.86	5.02	8/3/2014	$ 1,925.15	$ -2,541.49	L	8/4/2014		$ 4,584.38	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
9/14/2012	$ 1,465.77	$ 7,726.09	5.27	1/15/2015	$ 1,992.67	$ -2,777.29	L	1/16/2015		$ 4,948.79	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
5/21/2015	$ 2,130.82	$ 15,523.08	7.29	9/20/2017	$ 2,508.24	$ -2,749.51	L	9/21/2017		$ 12,773.57	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
11/3/2015	$ 2,109.79	$ 6,968.31	3.30	3/5/2018	$ 2,720.94	$ -2,018.53	L	3/6/2018		$ 4,949.78	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
8/15/2016	$ 2,190.15	$ 4,258.89	1.94	12/16/2018	$ 2,717.07	$ -1,024.63	L	1/0/1900		$ 3,234.26	
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -	
1/26/2018	$ 2,872.87	$ 8,142.26	2.83	5/28/2020	$ 2,717.07	$ 441.57	W	1/0/1900		$ 8,583.83	
6/12/2018	$ 2,786.85	$ 5,455.32	1.96	10/12/2020	$ 2,717.07	$ 136.60	W	1/0/1900		$ 5,591.91	

Table 46: Detail of long trades made under the 632-day Long/Short S&P 500 Strategy

LONG TRADES												
Trade Date	Price	Trade $	Trade Units	Close Date	Price	Close $	W/L	Settled		Settled $		
		$ 387,264.78				$ 92,904.65				$ 480,169.43		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/17/1950	$ 16.68	$ 2,211.00	132.55	4/9/1952	$ 23.94	$ 962.34	W	4/10/1952	132.55	$ 3,173.34		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/29/1951	$ 20.96	$ 992.52	47.35	3/22/1953	$ 26.18	$ 247.18	W	3/23/1953	47.35	$ 1,239.70		
11/23/1951	$ 22.40	$ 664.99	29.69	8/16/1953	$ 24.62	$ 65.90	W	8/17/1953	29.69	$ 730.89		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/22/1952	$ 23.80	$ 1,469.16	61.73	7/16/1954	$ 30.06	$ 386.43	W	7/19/1954	61.73	$ 1,855.59		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/14/1953	$ 22.71	$ 1,728.79	76.12	6/8/1955	$ 39.22	$ 1,256.82	W	6/9/1955	76.12	$ 2,985.60		
10/11/1955	$ 40.80	$ 3,807.68	93.33	7/4/1957	$ 48.46	$ 714.87	W	7/5/1957	93.33	$ 4,522.56		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
5/28/1956	$ 44.10	$ 1,145.21	25.97	2/19/1958	$ 41.15	$ -76.61	L	2/20/1958	25.97	$ 1,068.60		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/12/1957	$ 42.39	$ 344.44	8.13	11/6/1958	$ 52.45	$ 81.74	W	11/7/1958	8.13	$ 426.18		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/22/1957	$ 38.98	$ 1,985.19	50.93	7/16/1959	$ 59.41	$ 1,040.47	W	7/17/1959	50.93	$ 3,025.65		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/22/1959	$ 55.14	$ 2,787.02	50.54	6/15/1961	$ 65.69	$ 533.24	W	6/16/1961	50.54	$ 3,320.26		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/8/1960	$ 53.47	$ 1,251.09	23.40	11/30/1961	$ 71.32	$ 417.65	W	12/1/1961	23.40	$ 1,668.75		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/25/1960	$ 52.20	$ 561.62	10.76	7/19/1962	$ 56.42	$ 45.40	W	7/20/1962	10.76	$ 607.02		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/26/1962	$ 52.32	$ 2,738.15	52.33	3/19/1964	$ 79.30	$ 1,411.99	W	3/20/1964	52.33	$ 4,150.13		
10/23/1962	$ 53.49	$ 2,034.87	38.04	7/16/1964	$ 83.64	$ 1,146.97	W	7/17/1964	38.04	$ 3,181.84		
7/22/1963	$ 67.90	$ 1,494.93	22.02	4/14/1965	$ 88.24	$ 447.82	W	4/15/1965	22.02	$ 1,942.75		
11/22/1963	$ 69.61	$ 2,221.42	31.91	8/15/1965	$ 86.77	$ 547.62	W	8/16/1965	31.91	$ 2,769.03		
12/15/1964	$ 83.22	$ 3,907.90	46.96	9/8/1966	$ 76.05	$ -336.69	L	9/9/1966	46.96	$ 3,571.21		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/28/1965	$ 81.60	$ 2,183.80	26.76	3/22/1967	$ 90.25	$ 231.49	W	3/23/1967	26.76	$ 2,415.29		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/7/1966	$ 73.20	$ 2,771.04	37.86	6/30/1968	$ 99.58	$ 998.63	W	7/1/1968	37.86	$ 3,769.67		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/8/1967	$ 91.14	$ 3,325.22	36.48	8/1/1969	$ 93.47	$ 85.01	W	8/4/1969	36.48	$ 3,410.23		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/5/1968	$ 87.72	$ 1,492.69	17.02	11/27/1969	$ 93.27	$ 94.44	W	11/28/1969	17.02	$ 1,587.14		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/25/1969	$ 97.98	$ 1,503.54	15.35	11/19/1970	$ 82.91	$ -231.26	L	11/20/1970	15.35	$ 1,272.29		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/29/1969	$ 89.48	$ 1,914.23	21.39	4/22/1971	$ 103.56	$ 301.21	W	4/23/1971	21.39	$ 2,215.45		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
5/26/1970	$ 69.29	$ 2,647.62	38.21	2/17/1972	$ 105.59	$ 1,387.05	W	2/18/1972	38.21	$ 4,034.67		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/23/1971	$ 90.16	$ 2,629.49	29.16	8/16/1973	$ 102.29	$ 353.77	W	8/17/1973	29.16	$ 2,983.26		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/22/1973	$ 100.53	$ 5,526.98	54.98	5/16/1975	$ 90.43	$ -555.28	L	5/19/1975	54.98	$ 4,971.70		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/3/1974	$ 62.28	$ 2,481.06	39.84	6/26/1976	$ 103.72	$ 1,650.86	W	6/28/1976	39.84	$ 4,131.92		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/16/1975	$ 82.09	$ 4,170.46	50.80	6/9/1977	$ 98.14	$ 815.40	W	6/10/1977	50.80	$ 4,985.86		
6/7/1976	$ 98.63	$ 2,794.21	28.33	3/1/1978	$ 87.19	$ -324.10	L	3/2/1978	28.33	$ 2,470.11		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/10/1976	$ 98.81	$ 2,167.89	21.94	8/4/1978	$ 103.92	$ 112.11	W	8/7/1978	21.94	$ 2,280.00		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/6/1978	$ 86.90	$ 3,906.34	44.95	11/28/1979	$ 106.77	$ 893.20	W	11/29/1979	44.95	$ 4,799.54		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/14/1978	$ 92.49	$ 3,540.42	38.28	8/7/1980	$ 123.30	$ 1,179.37	W	8/8/1980	38.28	$ 4,719.79		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/7/1979	$ 99.87	$ 2,607.29	26.11	7/31/1981	$ 130.92	$ 810.62	W	8/3/1981	26.11	$ 3,417.90		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/27/1980	$ 98.22	$ 2,231.59	22.72	12/19/1981	$ 124.00	$ 585.73	W	12/21/1981	22.72	$ 2,817.32		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/20/1981	$ 126.58	$ 2,992.98	23.64	11/14/1982	$ 139.53	$ 306.20	W	11/15/1982	23.64	$ 3,299.18		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/25/1981	$ 112.77	$ 2,795.02	24.79	6/19/1983	$ 169.13	$ 1,396.89	W	6/20/1983	24.79	$ 4,191.92		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/8/1982	$ 107.34	$ 2,894.53	26.97	11/30/1983	$ 166.40	$ 1,592.61	W	12/1/1983	26.97	$ 4,487.14		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/12/1982	$ 102.42	$ 1,299.35	12.69	5/5/1984	$ 159.11	$ 719.20	W	5/7/1984	12.69	$ 2,018.55		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/8/1983	$ 159.18	$ 4,133.20	25.97	5/1/1985	$ 178.37	$ 498.28	W	5/2/1985	25.97	$ 4,631.48		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/23/1984	$ 154.29	$ 4,207.20	27.27	11/16/1985	$ 198.11	$ 1,194.89	W	11/18/1985	27.27	$ 5,402.09		
7/24/1984	$ 147.82	$ 3,484.95	23.58	4/17/1986	$ 243.03	$ 2,244.63	W	4/18/1986	23.58	$ 5,729.58		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/25/1985	$ 180.66	$ 4,591.79	25.42	6/19/1987	$ 306.97	$ 3,210.39	W	6/22/1987	25.42	$ 7,802.18		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/29/1986	$ 229.91	$ 4,522.47	19.67	6/22/1988	$ 275.66	$ 899.93	W	6/23/1988	19.67	$ 5,422.40		
5/20/1987	$ 278.21	$ 4,172.25	15.00	2/10/1989	$ 292.02	$ 207.11	W	2/13/1989	15.00	$ 4,379.36		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
12/4/1987	$ 223.92	$ 3,597.99	16.07	8/27/1989	$ 350.52	$ 2,034.23	W	8/28/1989	16.07	$ 5,632.22		
5/23/1988	$ 250.83	$ 2,410.65	9.61	2/14/1990	$ 332.01	$ 780.20	W	2/15/1990	9.61	$ 3,190.85		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/30/1990	$ 322.98	$ 5,997.00	18.57	10/24/1991	$ 385.07	$ 1,152.87	W	10/25/1991	18.57	$ 7,149.87		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/11/1990	$ 295.46	$ 4,350.02	14.72	7/4/1992	$ 411.77	$ 1,712.42	W	7/6/1992	14.72	$ 6,062.44		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/29/1991	$ 375.22	$ 7,154.86	19.07	8/22/1993	$ 456.16	$ 1,543.40	W	8/23/1993	19.07	$ 8,698.25		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/8/1992	$ 394.50	$ 3,211.81	8.14	12/31/1993	$ 466.45	$ 585.78	W	1/3/1994	8.14	$ 3,797.59		
10/9/1992	$ 402.66	$ 6,146.70	15.27	7/3/1994	$ 446.20	$ 664.65	W	7/5/1994	15.27	$ 6,811.34		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/4/1994	$ 438.92	$ 5,960.90	13.58	12/27/1995	$ 614.53	$ 2,384.93	W	12/28/1995	13.58	$ 8,345.82		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
12/1/1994	$ 445.45	$ 5,837.80	13.11	8/31/1996	$ 651.99	$ 2,706.79	W	9/3/1996	13.11	$ 8,544.60		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/24/1996	$ 626.65	$ 5,237.64	8.36	4/17/1998	$ 1,122.72	$ 4,146.23	W	4/20/1998	8.36	$ 9,383.88		
4/11/1997	$ 737.65	$ 6,328.94	8.58	1/3/1999	$ 1,229.23	$ 4,217.69	W	1/4/1999	8.58	$ 10,546.63		
10/27/1997	$ 876.99	$ 4,240.39	4.84	7/21/1999	$ 1,379.29	$ 2,428.70	W	7/22/1999	4.84	$ 6,669.09		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/31/1998	$ 957.28	$ 5,785.21	6.04	5/24/2000	$ 1,399.05	$ 2,669.78	W	5/25/2000	6.04	$ 8,454.99		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/15/1999	$ 1,247.41	$ 7,129.64	5.72	7/8/2001	$ 1,190.59	$ -324.76	L	7/9/2001	5.72	$ 6,804.88		
2/25/2000	$ 1,333.36	$ 4,776.86	3.58	11/18/2001	$ 1,138.65	$ -697.56	L	11/19/2001	3.58	$ 4,079.30		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/4/2001	$ 1,103.25	$ 4,684.99	4.25	12/27/2002	$ 875.40	$ -967.57	L	12/30/2002	4.25	$ 3,717.42		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
9/21/2001	$ 965.80	$ 6,308.08	6.53	6/15/2003	$ 988.61	$ 148.98	W	6/16/2003	6.53	$ 6,457.07		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/9/2002	$ 776.76	$ 7,599.13	9.78	7/2/2004	$ 1,125.38	$ 3,410.59	W	7/6/2004	9.78	$ 11,009.72		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/11/2003	$ 800.73	$ 7,392.07	9.23	12/2/2004	$ 1,190.33	$ 3,596.65	W	12/3/2004	9.23	$ 10,988.72		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/12/2004	$ 1,063.23	$ 10,135.43	9.53	5/6/2006	$ 1,325.76	$ 2,502.62	W	5/8/2006	9.53	$ 12,638.05		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
4/20/2005	$ 1,137.50	$ 7,913.90	6.96	1/12/2007	$ 1,430.73	$ 2,040.08	W	1/16/2007	6.96	$ 9,953.98		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/13/2005	$ 1,176.84	$ 3,552.55	3.02	7/7/2007	$ 1,530.44	$ 1,067.42	W	7/9/2007	3.02	$ 4,619.97		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/13/2006	$ 1,223.69	$ 7,795.42	6.37	3/6/2008	$ 1,304.34	$ 513.77	W	3/7/2008	6.37	$ 8,309.19		
3/5/2007	$ 1,374.12	$ 11,851.57	8.62	11/26/2008	$ 887.68	$ -4,195.47	L	11/28/2008	8.62	$ 7,656.10		
8/15/2007	$ 1,406.70	$ 10,864.92	7.72	5/8/2009	$ 929.23	$ -3,687.83	L	5/11/2009	7.72	$ 7,177.09		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
3/10/2008	$ 1,273.37	$ 9,398.15	7.38	12/2/2009	$ 1,109.24	$ -1,211.37	L	12/3/2009	7.38	$ 8,186.78		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/20/2008	$ 752.44	$ 4,218.83	5.61	8/14/2010	$ 1,079.25	$ 1,832.38	W	8/16/2010	5.61	$ 6,051.21		
3/9/2009	$ 676.53	$ 5,353.13	7.91	12/1/2010	$ 1,206.07	$ 4,190.05	W	12/2/2010	7.91	$ 9,543.18		
2/8/2010	$ 1,056.74	$ 12,085.29	11.44	11/2/2011	$ 1,237.90	$ 2,071.82	W	11/3/2011	11.44	$ 14,157.11		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
7/2/2010	$ 1,022.58	$ 7,167.15	7.01	3/25/2012	$ 1,397.11	$ 2,625.04	W	3/26/2012	7.01	$ 9,792.19		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
10/3/2011	$ 1,099.23	$ 6,665.25	6.06	6/26/2013	$ 1,603.26	$ 3,056.22	W	6/27/2013	6.06	$ 9,721.47		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
6/1/2012	$ 1,278.04	$ 10,512.86	8.23	2/23/2014	$ 1,836.25	$ 4,591.70	W	2/24/2014	8.23	$ 15,104.56		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/15/2012	$ 1,353.33	$ 4,719.22	3.49	8/9/2014	$ 1,931.59	$ 2,016.46	W	8/11/2014	3.49	$ 6,735.68		
2/3/2014	$ 1,741.89	$ 13,024.54	7.48	10/28/2015	$ 2,090.35	$ 2,605.52	W	10/29/2015	7.48	$ 15,630.06		
10/15/2014	$ 1,862.49	$ 17,491.12	9.39	7/8/2016	$ 2,129.90	$ 2,511.32	W	7/11/2016	9.39	$ 20,002.44		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
8/25/2015	$ 1,867.61	$ 7,851.76	4.20	5/18/2017	$ 2,365.72	$ 2,094.14	W	5/19/2017	4.20	$ 9,945.91		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
2/11/2016	$ 1,829.08	$ 6,980.46	3.82	11/4/2017	$ 2,587.84	$ 2,895.72	W	11/6/2017	3.82	$ 9,876.18		
6/27/2016	$ 2,000.54	$ 4,676.91	2.34	3/21/2018	$ 2,711.93	$ 1,663.10	W	3/22/2018	2.34	$ 6,340.02		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
11/4/2016	$ 2,085.18	$ 6,522.00	3.13	7/29/2018	$ 2,717.07	$ 1,976.42	W	1/0/1900	3.13	$ 8,498.42		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900	0.00	$ -		

Table 47: Detail of short trades made under the 632-day Long/Short S&P 500 Strategy

SHORT TRADES											
Trade Date	Price	Trade $	Trade Units	Close Date	Price	Close $	W/L	Settled		Settled $
		389,237.27				-26,067.24				363,170.03
6/12/1950	$ 19.40	$ 3,300.00	170.10	3/5/1952	$ 23.71	$ -733.14	L	3/6/1952	170.10	$ 2,566.86
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/3/1951	$ 22.81	$ 1,481.37	64.94	1/24/1953	$ 26.07	$ -211.72	L	1/26/1953		$ 1,269.65
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/22/1952	$ 24.66	$ 445.54	18.07	10/15/1953	$ 23.95	$ 12.83	W	10/16/1953		$ 458.37
8/8/1952	$ 25.55	$ 2,192.78	85.82	5/2/1954	$ 28.26	$ -232.58	L	5/3/1954		$ 1,960.20
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/5/1953	$ 26.66	$ 984.34	36.92	9/29/1954	$ 32.50	$ -215.62	L	9/30/1954		$ 768.71
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/14/1955	$ 46.41	$ 2,551.15	54.97	8/7/1957	$ 47.03	$ -34.08	L	8/8/1957		$ 2,517.07
3/20/1956	$ 48.87	$ 1,709.27	34.98	12/12/1957	$ 40.55	$ 291.00	W	12/13/1957		$ 2,000.27
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/2/1956	$ 49.64	$ 767.29	15.46	4/26/1958	$ 43.36	$ 97.07	W	4/28/1958		$ 864.36
8/3/1956	$ 49.64	$ 514.08	10.36	4/27/1958	$ 43.36	$ 65.04	W	4/28/1958		$ 579.12
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/15/1957	$ 49.13	$ 1,723.22	35.07	4/8/1959	$ 56.21	$ -248.33	L	4/9/1959		$ 1,474.89
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/3/1959	$ 60.71	$ 4,159.73	68.52	4/26/1961	$ 65.55	$ -331.63	L	4/27/1961		$ 3,828.10
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/5/1960	$ 60.39	$ 1,867.30	30.92	9/28/1961	$ 66.58	$ -191.40	L	9/29/1961		$ 1,675.90
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/24/1960	$ 58.07	$ 838.23	14.43	5/18/1962	$ 63.82	$ -83.00	L	5/21/1962		$ 755.23
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
4/17/1961	$ 68.68	$ 376.28	5.48	1/9/1963	$ 64.59	$ 22.41	W	1/10/1963		$ 398.69
12/12/1961	$ 72.64	$ 3,714.81	51.14	9/5/1963	$ 73.00	$ -18.41	L	9/6/1963		$ 3,696.39
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/13/1965	$ 90.27	$ 3,259.40	36.11	2/4/1967	$ 87.36	$ 105.07	W	2/6/1967		$ 3,364.47
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
2/9/1966	$ 94.06	$ 2,376.93	25.27	11/3/1967	$ 91.78	$ 57.62	W	11/6/1967		$ 2,434.54
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
9/25/1967	$ 97.59	$ 3,763.92	38.57	6/18/1969	$ 97.81	$ -8.49	L	6/19/1969		$ 3,755.43
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/12/1968	$ 96.72	$ 2,227.90	23.03	10/5/1969	$ 93.19	$ 81.31	W	10/6/1969		$ 2,309.21
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/29/1968	$ 108.37	$ 2,244.10	20.71	8/23/1970	$ 79.24	$ 603.22	W	8/24/1970		$ 2,847.31
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/14/1969	$ 106.16	$ 1,007.37	9.49	2/5/1971	$ 96.93	$ 87.59	W	2/8/1971		$ 1,094.96
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/10/1969	$ 98.33	$ 3,169.95	32.24	8/4/1971	$ 93.89	$ 143.14	W	8/5/1971		$ 3,313.09
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
4/28/1971	$ 104.77	$ 4,225.81	40.33	1/19/1973	$ 118.78	$ -565.08	L	1/22/1973		$ 3,660.73
9/8/1971	$ 101.34	$ 3,924.61	38.73	6/1/1973	$ 103.93	$ -100.30	L	6/4/1973		$ 3,824.31
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/11/1973	$ 120.24	$ 3,093.20	25.73	10/5/1974	$ 62.34	$ 1,489.49	W	10/7/1974		$ 4,582.69
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
10/12/1973	$ 111.44	$ 3,703.08	33.23	7/6/1975	$ 94.36	$ 567.56	W	7/7/1975		$ 4,270.64
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/15/1975	$ 95.61	$ 6,224.57	65.10	4/7/1977	$ 98.35	$ -178.38	L	4/11/1977		$ 6,046.19
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
9/21/1976	$ 107.83	$ 3,235.65	30.01	6/15/1978	$ 98.34	$ 284.77	W	6/16/1978		$ 3,520.42
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
12/31/1976	$ 107.46	$ 1,452.49	13.52	9/24/1978	$ 101.84	$ 75.96	W	9/25/1978		$ 1,528.45
7/19/1977	$ 101.79	$ 4,613.74	45.33	4/12/1979	$ 102.00	$ -9.52	L	4/16/1979		$ 4,604.22
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
9/12/1978	$ 106.99	$ 4,531.39	42.35	6/5/1980	$ 112.78	$ -245.23	L	6/6/1980		$ 4,286.16
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
10/5/1979	$ 111.27	$ 3,891.47	34.97	6/28/1981	$ 132.56	$ -744.58	L	6/29/1981		$ 3,146.89
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
2/13/1980	$ 118.44	$ 3,330.73	28.12	11/6/1981	$ 122.67	$ -118.95	L	11/9/1981		$ 3,211.78
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/28/1980	$ 140.52	$ 4,467.13	31.79	8/22/1982	$ 113.02	$ 874.23	W	8/23/1982		$ 5,341.36
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/11/1981	$ 133.85	$ 4,171.68	31.17	5/5/1983	$ 164.28	$ -948.41	L	5/6/1983		$ 3,223.27
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/30/1981	$ 126.35	$ 2,932.55	23.21	8/24/1983	$ 161.25	$ -810.02	L	8/25/1983		$ 2,122.53
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/7/1982	$ 119.47	$ 1,939.33	16.23	1/29/1984	$ 163.94	$ -721.87	L	1/30/1984		$ 1,217.46
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
6/22/1983	$ 170.99	$ 6,168.96	36.08	3/15/1985	$ 176.53	$ -199.87	L	3/18/1985		$ 5,969.08
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
10/10/1983	$ 172.65	$ 3,469.68	20.10	7/3/1985	$ 191.45	$ -377.82	L	7/5/1985		$ 3,091.86
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/17/1985	$ 195.65	$ 6,853.42	35.03	4/10/1987	$ 292.49	$ -3,392.20	L	4/13/1987		$ 3,461.21
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
9/4/1986	$ 253.83	$ 6,749.95	26.59	5/28/1988	$ 253.42	$ 10.90	W	5/31/1988		$ 6,760.85
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/25/1987	$ 336.77	$ 5,370.13	15.95	5/18/1989	$ 317.97	$ 299.78	W	5/19/1989		$ 5,669.91
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/5/1988	$ 275.81	$ 5,635.61	20.43	3/29/1990	$ 340.79	$ -1,327.73	L	3/30/1990		$ 4,307.88
10/9/1989	$ 359.80	$ 8,950.75	24.88	7/3/1991	$ 373.33	$ -336.59	L	7/5/1991		$ 8,614.16
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/16/1990	$ 368.95	$ 6,492.57	17.60	4/8/1992	$ 394.50	$ -449.61	L	4/9/1992		$ 6,042.96
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
4/17/1991	$ 390.45	$ 2,914.51	7.46	1/8/1993	$ 429.05	$ -288.13	L	1/11/1993		$ 2,626.38
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/15/1992	$ 420.77	$ 4,793.75	11.39	10/8/1993	$ 460.31	$ -450.47	L	10/11/1993		$ 4,343.28
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
3/10/1993	$ 456.33	$ 4,984.99	10.92	12/2/1994	$ 453.30	$ 33.10	W	12/5/1994		$ 5,018.09
2/2/1994	$ 482.00	$ 8,896.86	18.46	10/27/1995	$ 579.70	$ -1,803.37	L	10/30/1995		$ 7,093.49
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/30/1994	$ 476.07	$ 6,241.54	13.11	5/23/1996	$ 676.00	$ -2,621.19	L	5/24/1996		$ 3,620.35
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
2/12/1996	$ 661.45	$ 9,006.30	13.62	11/5/1997	$ 942.76	$ -3,830.32	L	11/6/1997		$ 5,175.99
5/24/1996	$ 678.51	$ 6,034.22	8.89	2/15/1998	$ 1,020.09	$ -3,037.79	L	2/17/1998		$ 2,996.43
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/17/1998	$ 1,186.75	$ 8,634.64	7.28	4/9/2000	$ 1,516.35	$ -2,398.13	L	4/10/2000		$ 6,236.51
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
7/16/1999	$ 1,418.78	$ 7,356.48	5.19	4/8/2001	$ 1,128.43	$ 1,505.49	W	4/9/2001		$ 8,861.96
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
3/24/2000	$ 1,527.46	$ 3,200.50	2.10	12/16/2001	$ 1,123.09	$ 847.28	W	12/17/2001		$ 4,047.77
9/1/2000	$ 1,520.77	$ 6,992.53	4.60	5/26/2002	$ 1,083.82	$ 2,009.10	W	5/28/2002		$ 9,001.63
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/21/2001	$ 1,312.83	$ 6,063.39	4.62	2/12/2003	$ 818.68	$ 2,282.27	W	2/13/2003		$ 8,345.66
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/4/2002	$ 1,172.51	$ 6,908.35	5.89	9/28/2003	$ 996.85	$ 1,034.98	W	9/29/2003		$ 7,943.33
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/27/2002	$ 938.87	$ 5,091.42	5.42	8/20/2004	$ 1,098.35	$ -864.85	L	8/23/2004		$ 4,226.57
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
2/11/2004	$ 1,157.76	$ 9,704.82	8.38	11/4/2005	$ 1,220.14	$ -522.89	L	11/7/2005		$ 9,181.92
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
3/7/2005	$ 1,225.31	$ 11,811.79	9.64	11/29/2006	$ 1,399.48	$ -1,678.97	L	11/30/2006		$ 10,132.82
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/1/2005	$ 1,245.04	$ 5,302.31	4.26	4/27/2007	$ 1,494.07	$ -1,060.56	L	4/30/2007		$ 4,241.76
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/5/2006	$ 1,325.76	$ 5,410.24	4.08	1/27/2008	$ 1,330.61	$ -19.79	L	1/28/2008		$ 5,390.45
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
10/9/2007	$ 1,565.15	$ 7,279.50	4.65	7/2/2009	$ 896.42	$ 3,110.26	W	7/6/2009		$ 10,389.76
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/19/2008	$ 1,426.63	$ 6,296.76	4.41	2/10/2010	$ 1,068.13	$ 1,582.32	W	2/11/2010		$ 7,879.08
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
4/23/2010	$ 1,217.28	$ 10,697.24	8.79	1/15/2012	$ 1,289.09	$ -631.05	L	1/17/2012		$ 10,066.19
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
4/29/2011	$ 1,363.61	$ 9,948.14	7.30	1/20/2013	$ 1,485.98	$ -892.74	L	1/22/2013		$ 9,055.40
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
4/2/2012	$ 1,419.04	$ 15,690.83	11.06	12/25/2013	$ 1,833.32	$ -4,580.84	L	12/26/2013		$ 11,109.99
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
9/14/2012	$ 1,465.77	$ 7,043.61	4.81	6/8/2014	$ 1,949.44	$ -2,324.23	L	6/9/2014		$ 4,719.39
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
5/21/2015	$ 2,130.82	$ 11,719.05	5.50	2/11/2017	$ 2,316.10	$ -1,019.00	L	2/13/2017		$ 10,700.05
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
11/3/2015	$ 2,109.79	$ 10,418.60	4.94	7/27/2017	$ 2,475.42	$ -1,805.56	L	7/28/2017		$ 8,613.04
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
8/15/2016	$ 2,190.15	$ 9,734.33	4.44	5/9/2018	$ 2,697.79	$ -2,256.26	L	1/0/1900		$ 7,478.08
1/0/1900	$ -	$ -	0.00	1/0/1900	$ -	$ -		1/0/1900		$ -
1/26/2018	$ 2,872.87	$ 17,284.35	6.02	10/20/2019	$ 2,717.07	$ 937.36	W	1/0/1900		$ 18,221.71
6/12/2018	$ 2,786.85	$ 13,672.72	4.91	3/5/2020	$ 2,717.07	$ 342.35	W	1/0/1900		$ 14,015.07

Table 48: Detail of trades made under the 854-day Maximizer S&P 500 Strategy

LONG TRADES										
Trade Date	Price	Trade $	Trade Units	Close Date	Price	Close $	W/L	Settled		Settled $
		$ 3,392,775.86				$ 604,731.24				$ 3,997,507.10
6/12/1950	$ 19.40	$ 7,500.00	386.60	10/12/1952	$ 24.55	$ 1,990.98	W	10/14/1952	386.60	$ 9,490.98
7/17/1950	$ 16.68	$ 1,875.00	112.41	11/16/1952	$ 24.75	$ 907.15	W	11/17/1952	112.41	$ 2,782.15
5/3/1951	$ 22.81	$ 468.75	20.55	9/2/1953	$ 23.56	$ 15.41	W	9/3/1953	20.55	$ 484.16
6/29/1951	$ 20.96	$ 117.19	5.59	10/29/1953	$ 24.58	$ 20.24	W	10/30/1953	5.59	$ 137.43
11/23/1951	$ 22.40	$ 29.30	1.31	3/25/1954	$ 26.42	$ 5.26	W	3/26/1954	1.31	$ 34.55
1/22/1952	$ 24.66	$ 7.32	0.30	5/24/1954	$ 29.00	$ 1.29	W	5/25/1954	0.30	$ 8.61
8/8/1952	$ 25.55	$ 1.83	0.07	12/9/1954	$ 34.69	$ 0.66	W	12/10/1954	0.07	$ 2.49
10/22/1952	$ 23.80	$ 7,118.69	299.10	2/22/1955	$ 36.85	$ 3,903.32	W	2/23/1955	299.10	$ 11,022.01
1/5/1953	$ 26.66	$ 3,866.28	145.02	5/8/1955	$ 37.89	$ 1,628.60	W	5/9/1955	145.02	$ 5,494.88
9/14/1953	$ 22.71	$ 1,329.69	58.55	1/15/1956	$ 44.67	$ 1,285.78	W	1/16/1956	58.55	$ 2,615.47
10/11/1955	$ 40.80	$ 12,857.40	315.13	2/10/1958	$ 41.48	$ 214.29	W	2/11/1958	315.13	$ 13,071.69
11/14/1955	$ 46.41	$ 3,214.35	69.26	3/16/1958	$ 42.33	$ -282.58	L	3/17/1958	69.26	$ 2,931.77
3/20/1956	$ 48.87	$ 2,765.19	56.58	7/21/1958	$ 46.33	$ -143.72	L	7/22/1958	56.58	$ 2,621.47
5/28/1956	$ 44.10	$ 691.30	15.68	9/28/1958	$ 49.66	$ 87.16	W	9/29/1958	15.68	$ 778.46
8/2/1956	$ 49.64	$ 172.82	3.48	12/3/1958	$ 52.53	$ 10.06	W	12/4/1958	3.48	$ 182.89
8/3/1956	$ 49.64	$ 43.21	0.87	12/4/1958	$ 52.55	$ 2.53	W	12/5/1958	0.87	$ 45.74
2/12/1957	$ 42.39	$ 10.80	0.25	6/15/1959	$ 56.99	$ 3.72	W	6/16/1959	0.25	$ 14.52
7/15/1957	$ 49.13	$ 2.70	0.05	11/15/1959	$ 56.85	$ 0.42	W	11/16/1959	0.05	$ 3.12
10/22/1957	$ 38.98	$ 0.68	0.02	2/22/1960	$ 56.24	$ 0.30	W	2/23/1960	0.02	$ 0.97
8/3/1959	$ 60.71	$ 14,735.07	242.71	12/3/1961	$ 71.78	$ 2,686.83	W	12/4/1961	242.71	$ 17,421.90
9/22/1959	$ 55.14	$ 3,683.77	66.81	1/22/1962	$ 68.81	$ 913.26	W	1/23/1962	66.81	$ 4,597.03
1/5/1960	$ 60.39	$ 923.29	15.29	5/7/1962	$ 66.02	$ 86.08	W	5/8/1962	15.29	$ 1,009.36
3/8/1960	$ 53.47	$ 231.55	4.33	7/9/1962	$ 56.55	$ 13.34	W	7/10/1962	4.33	$ 244.89
8/24/1960	$ 58.07	$ 57.89	1.00	12/25/1962	$ 62.63	$ 4.55	W	12/26/1962	1.00	$ 62.43
10/25/1960	$ 52.20	$ 14.47	0.28	2/25/1963	$ 65.46	$ 3.68	W	2/26/1963	0.28	$ 18.15
4/17/1961	$ 68.68	$ 3.62	0.05	8/18/1963	$ 71.49	$ 0.15	W	8/19/1963	0.05	$ 3.77
12/12/1961	$ 72.64	$ 13,067.33	179.89	4/13/1964	$ 79.77	$ 1,282.63	W	4/14/1964	179.89	$ 14,349.95
6/26/1962	$ 52.32	$ 7,471.62	142.81	10/26/1964	$ 85.00	$ 4,666.91	W	10/27/1964	142.81	$ 12,138.53
10/23/1962	$ 53.49	$ 2,051.57	38.35	2/22/1965	$ 86.21	$ 1,254.95	W	2/23/1965	38.35	$ 3,306.53
7/22/1963	$ 67.90	$ 573.33	8.44	11/21/1965	$ 92.24	$ 205.52	W	11/22/1965	8.44	$ 778.85
11/22/1963	$ 69.61	$ 146.16	2.10	3/24/1966	$ 89.29	$ 41.32	W	3/25/1966	2.10	$ 187.48
12/15/1964	$ 83.22	$ 19,902.90	239.16	4/17/1967	$ 91.07	$ 1,877.41	W	4/18/1967	239.16	$ 21,780.31
5/13/1965	$ 90.27	$ 7,455.62	82.59	9/13/1967	$ 95.99	$ 472.43	W	9/14/1967	82.59	$ 7,928.05
6/28/1965	$ 81.60	$ 1,863.91	22.84	10/29/1967	$ 94.96	$ 305.17	W	10/30/1967	22.84	$ 2,169.07
2/9/1966	$ 94.06	$ 1,050.11	11.16	6/11/1968	$ 101.66	$ 84.85	W	6/13/1968	11.16	$ 1,134.96
10/7/1966	$ 73.20	$ 403.14	5.51	2/6/1969	$ 103.54	$ 167.09	W	2/7/1969	5.51	$ 570.23
9/25/1967	$ 97.59	$ 22,382.05	229.35	1/25/1970	$ 89.37	$ -1,885.24	L	1/26/1970	229.35	$ 20,496.82
11/8/1967	$ 91.14	$ 7,222.32	79.24	3/10/1970	$ 88.75	$ -189.39	L	3/11/1970	79.24	$ 7,032.93
1/12/1968	$ 96.72	$ 1,805.58	18.67	5/14/1970	$ 75.44	$ -397.26	L	5/15/1970	18.67	$ 1,408.32
3/5/1968	$ 87.72	$ 451.39	5.15	7/6/1970	$ 71.78	$ -82.03	L	7/7/1970	5.15	$ 369.37
11/29/1968	$ 108.37	$ 964.07	8.90	4/1/1971	$ 100.39	$ -70.99	L	4/2/1971	8.90	$ 893.08
2/25/1969	$ 97.98	$ 668.69	6.82	6/28/1971	$ 97.74	$ -1.64	L	6/29/1971	6.82	$ 667.05
5/14/1969	$ 106.16	$ 167.17	1.57	9/14/1971	$ 99.34	$ -10.74	L	9/15/1971	1.57	$ 156.43
7/29/1969	$ 89.48	$ 41.79	0.47	11/29/1971	$ 93.41	$ 1.84	W	11/30/1971	0.47	$ 43.63
11/10/1969	$ 98.33	$ 10.45	0.11	3/12/1972	$ 108.38	$ 1.07	W	3/13/1972	0.11	$ 11.52
5/26/1970	$ 69.29	$ 21,706.16	313.27	9/25/1972	$ 108.05	$ 12,142.17	W	9/26/1972	313.27	$ 33,848.33
4/28/1971	$ 104.77	$ 6,373.38	60.83	8/28/1973	$ 103.02	$ -106.46	L	8/29/1973	60.83	$ 6,266.92
9/8/1971	$ 101.34	$ 2,093.63	20.66	1/8/1974	$ 96.12	$ -107.84	L	1/9/1974	20.66	$ 1,985.79
11/23/1971	$ 90.16	$ 640.73	7.11	3/25/1974	$ 97.64	$ 53.16	W	3/26/1974	7.11	$ 693.89
1/11/1973	$ 120.24	$ 25,587.79	212.81	5/14/1975	$ 92.27	$ -5,952.18	L	5/15/1975	212.81	$ 19,635.60
8/22/1973	$ 100.53	$ 6,396.95	63.63	12/23/1975	$ 88.73	$ -750.86	L	12/24/1975	63.63	$ 5,646.09
10/12/1973	$ 111.44	$ 6,299.43	56.53	2/12/1976	$ 100.25	$ -632.54	L	2/13/1976	56.53	$ 5,666.88
10/3/1974	$ 62.28	$ 3,584.62	57.56	2/2/1977	$ 102.36	$ 2,306.86	W	2/3/1977	57.56	$ 5,891.48
7/15/1975	$ 95.61	$ 15,622.86	163.40	11/14/1977	$ 95.32	$ -47.39	L	11/15/1977	163.40	$ 15,575.47
9/16/1975	$ 82.09	$ 3,905.71	47.58	1/16/1978	$ 89.43	$ 349.23	W	1/17/1978	47.58	$ 4,254.94
6/7/1976	$ 98.63	$ 9,461.16	95.93	10/8/1978	$ 103.52	$ 469.08	W	10/9/1978	95.93	$ 9,930.23
9/21/1976	$ 107.83	$ 2,365.29	21.94	1/22/1979	$ 99.90	$ -173.95	L	1/23/1979	21.94	$ 2,191.34
11/10/1976	$ 98.81	$ 591.32	5.98	3/13/1979	$ 99.84	$ 6.16	W	3/14/1979	5.98	$ 597.49
12/31/1976	$ 107.46	$ 147.83	1.38	5/3/1979	$ 101.81	$ -7.77	L	5/4/1979	1.38	$ 140.06
7/19/1977	$ 101.79	$ 4,455.57	43.77	11/19/1979	$ 104.23	$ 106.80	W	11/20/1979	43.77	$ 4,562.37
3/6/1978	$ 86.90	$ 15,986.70	183.97	7/6/1980	$ 117.46	$ 5,622.02	W	7/7/1980	183.97	$ 21,608.72
9/12/1978	$ 106.99	$ 3,996.68	37.36	1/12/1981	$ 133.52	$ 991.04	W	1/13/1981	37.36	$ 4,987.72
11/14/1978	$ 92.49	$ 8,446.84	91.33	3/16/1981	$ 134.68	$ 3,853.09	W	3/17/1981	91.33	$ 12,299.93
10/5/1979	$ 111.27	$ 4,308.38	38.72	2/4/1982	$ 116.42	$ 199.41	W	2/5/1982	38.72	$ 4,507.78
11/7/1979	$ 99.87	$ 1,077.09	10.78	3/9/1982	$ 108.83	$ 96.63	W	3/10/1982	10.78	$ 1,173.73
2/13/1980	$ 118.44	$ 3,691.05	31.16	6/15/1982	$ 109.69	$ -272.68	L	6/16/1982	31.16	$ 3,418.37
3/27/1980	$ 98.22	$ 922.76	9.39	7/28/1982	$ 107.74	$ 89.44	W	7/29/1982	9.39	$ 1,012.20
11/28/1980	$ 140.52	$ 16,437.23	116.97	3/31/1983	$ 152.96	$ 1,455.16	W	4/4/1983	116.97	$ 17,892.39
2/20/1981	$ 126.58	$ 7,850.10	62.02	6/23/1983	$ 170.57	$ 2,728.12	W	6/24/1983	62.02	$ 10,578.22
8/11/1981	$ 133.85	$ 11,187.48	83.58	12/12/1983	$ 165.62	$ 2,655.41	W	12/13/1983	83.58	$ 13,842.88
9/25/1981	$ 112.77	$ 2,796.87	24.80	1/26/1984	$ 164.24	$ 1,276.54	W	1/27/1984	24.80	$ 4,073.40
11/30/1981	$ 126.35	$ 699.22	5.53	4/1/1984	$ 159.18	$ 181.68	W	4/2/1984	5.53	$ 880.90
3/8/1982	$ 107.34	$ 3,555.64	33.13	7/8/1984	$ 152.24	$ 1,487.31	W	7/9/1984	33.13	$ 5,042.96
5/7/1982	$ 119.47	$ 1,769.21	14.81	9/6/1984	$ 165.65	$ 683.87	W	9/7/1984	14.81	$ 2,453.08
8/12/1982	$ 102.42	$ 3,765.23	36.76	12/12/1984	$ 162.63	$ 2,213.48	W	12/13/1984	36.76	$ 5,978.71
6/22/1983	$ 170.99	$ 14,360.60	83.99	10/22/1985	$ 188.04	$ 1,431.94	W	10/23/1985	83.99	$ 15,792.55
8/8/1983	$ 159.18	$ 11,523.82	72.39	12/8/1985	$ 202.99	$ 3,171.62	W	12/9/1985	72.39	$ 14,695.44
10/10/1983	$ 172.65	$ 2,880.95	16.69	2/9/1986	$ 214.56	$ 699.34	W	2/10/1986	16.69	$ 3,580.29
2/23/1984	$ 154.29	$ 14,157.45	91.76	6/25/1986	$ 248.93	$ 8,684.05	W	6/26/1986	91.76	$ 22,841.50
7/24/1984	$ 147.82	$ 7,982.25	54.00	11/24/1986	$ 247.45	$ 5,380.00	W	11/25/1986	54.00	$ 13,362.26
7/17/1985	$ 195.65	$ 8,319.40	42.52	11/17/1987	$ 243.04	$ 2,015.11	W	11/18/1987	42.52	$ 10,334.51
9/25/1985	$ 180.66	$ 2,079.85	11.51	1/26/1988	$ 249.57	$ 793.33	W	1/27/1988	11.51	$ 2,873.18
9/4/1986	$ 253.83	$ 43,202.29	170.20	1/4/1989	$ 279.43	$ 4,357.16	W	1/5/1989	170.20	$ 47,559.45
9/29/1986	$ 229.91	$ 10,800.57	46.98	1/29/1989	$ 293.82	$ 3,002.33	W	1/30/1989	46.98	$ 13,802.90
5/20/1987	$ 278.21	$ 12,721.83	45.73	9/19/1989	$ 346.55	$ 3,125.01	W	9/20/1989	45.73	$ 15,846.85
8/25/1987	$ 336.77	$ 3,180.46	9.44	12/5/1989	$ 347.42	$ 100.58	W	12/6/1989	9.44	$ 3,281.04
12/4/1987	$ 223.92	$ 8,546.00	38.17	4/5/1990	$ 340.73	$ 4,458.10	W	4/6/1990	38.17	$ 13,004.10
5/23/1988	$ 250.83	$ 4,291.38	17.11	9/23/1990	$ 311.32	$ 1,034.91	W	9/24/1990	17.11	$ 5,326.29
7/5/1988	$ 275.81	$ 1,072.85	3.89	11/5/1990	$ 314.59	$ 150.85	W	11/6/1990	3.89	$ 1,223.69
10/9/1989	$ 359.80	$ 58,175.11	161.69	2/9/1992	$ 411.09	$ 8,292.95	W	2/10/1992	161.69	$ 66,468.06
1/30/1990	$ 322.98	$ 17,004.56	52.65	6/1/1992	$ 417.30	$ 4,965.85	W	6/2/1992	52.65	$ 21,970.40
7/16/1990	$ 368.95	$ 14,004.22	37.96	11/15/1992	$ 422.43	$ 2,029.94	W	11/16/1992	37.96	$ 16,034.15
10/11/1990	$ 295.46	$ 7,495.77	25.37	2/10/1993	$ 446.23	$ 3,825.01	W	2/11/1993	25.37	$ 11,320.78
4/17/1991	$ 390.45	$ 2,791.71	7.15	8/17/1993	$ 453.13	$ 448.16	W	8/18/1993	7.15	$ 3,239.87
11/29/1991	$ 375.22	$ 697.93	1.86	3/31/1994	$ 445.77	$ 131.23	W	4/4/1994	1.86	$ 829.15
1/15/1992	$ 420.77	$ 174.48	0.41	5/17/1994	$ 449.37	$ 11.86	W	5/18/1994	0.41	$ 186.34
4/8/1992	$ 394.50	$ 49,894.66	126.48	8/9/1994	$ 457.92	$ 8,021.09	W	8/10/1994	126.48	$ 57,915.75
10/9/1992	$ 402.66	$ 28,951.47	71.90	2/9/1995	$ 480.19	$ 5,574.45	W	2/10/1995	71.90	$ 34,525.92
3/10/1993	$ 456.33	$ 27,754.07	60.82	7/11/1995	$ 554.78	$ 5,987.75	W	7/12/1995	60.82	$ 33,741.82
2/2/194	$ 482.00	$ 9,368.42	19.44	6/4/1996	$ 672.56	$ 3,703.83	W	6/5/1996	19.44	$ 13,072.25
4/4/1994	$ 438.92	$ 2,342.11	5.34	8/4/1996	$ 662.49	$ 1,192.98	W	8/5/1996	5.34	$ 3,535.09
8/30/1994	$ 476.07	$ 44,783.96	94.07	12/30/1996	$ 753.85	$ 26,130.80	W	12/31/1996	94.07	$ 70,914.76
12/8/1994	$ 445.45	$ 11,195.99	25.13	4/9/1997	$ 760.60	$ 7,921.01	W	4/10/1997	25.13	$ 19,117.01
2/12/1996	$ 661.45	$ 53,999.80	81.64	6/14/1998	$ 1,098.84	$ 35,707.87	W	6/15/1998	81.64	$ 89,707.67
5/24/1996	$ 678.51	$ 13,499.95	19.90	9/24/1998	$ 1,042.72	$ 7,246.49	W	9/25/1998	19.90	$ 20,746.44
7/24/1996	$ 626.65	$ 13,179.18	21.03	11/24/1998	$ 1,182.99	$ 11,700.48	W	11/25/1998	21.03	$ 24,879.65
4/11/1997	$ 737.65	$ 73,469.94	99.60	8/12/1999	$ 1,298.16	$ 55,826.79	W	8/13/1999	99.60	$ 129,296.73
10/27/1997	$ 876.99	$ 18,367.48	20.94	2/27/2000	$ 1,333.36	$ 9,558.11	W	2/28/2000	20.94	$ 27,925.60
7/15/1998	$ 1,186.75	$ 71,872.62	60.56	11/16/2000	$ 1,372.32	$ 11,238.59	W	11/17/2000	60.56	$ 83,111.21
8/31/1998	$ 957.28	$ 17,968.15	18.77	12/31/2000	$ 1,320.28	$ 6,813.51	W	1/2/2001	18.77	$ 24,781.67
7/16/1999	$ 1,418.78	$ 38,711.61	27.29	11/15/2001	$ 1,142.24	$ -7,545.43	L	11/16/2001	27.29	$ 31,166.17
10/15/1999	$ 1,247.41	$ 106,650.45	85.50	2/14/2002	$ 1,116.48	$ -11,194.19	L	2/15/2002	85.50	$ 95,456.26
2/25/2000	$ 1,333.36	$ 26,662.61	20.00	6/27/2002	$ 990.64	$ -6,853.22	L	6/28/2002	20.00	$ 19,809.39
3/24/2000	$ 1,527.46	$ 27,669.85	18.08	7/25/2002	$ 838.68	$ -12,450.15	L	7/26/2002	18.08	$ 15,159.70
9/1/2000	$ 1,520.77	$ 6,902.46	4.54	1/2/2003	$ 909.03	$ -2,776.56	L	1/3/2003	4.54	$ 4,125.90
4/4/2001	$ 1,103.25	$ 82,645.28	74.91	8/5/2003	$ 965.46	$ -10,321.95	L	8/6/2003	74.91	$ 72,323.33
5/21/2001	$ 1,312.83	$ 20,661.32	15.74	9/21/2003	$ 1,036.30	$ -4,352.03	L	9/22/2003	15.74	$ 16,309.29
9/21/2001	$ 965.80	$ 5,165.33	5.35	1/22/2004	$ 1,143.94	$ 952.74	W	1/23/2004	5.35	$ 6,118.06
3/4/2002	$ 1,172.51	$ 24,665.96	21.04	5/6/2004	$ 1,113.99	$ -1,231.08	L	5/7/2004	21.04	$ 23,434.88
10/9/2002	$ 776.76	$ 103,985.50	133.87	2/8/2005	$ 1,202.30	$ 56,967.39	W	2/9/2005	133.87	$ 160,952.89
11/27/2002	$ 938.87	$ 25,996.37	27.69	3/29/2005	$ 1,165.36	$ 6,271.28	W	3/30/2005	27.69	$ 32,267.66
3/11/2003	$ 800.73	$ 9,593.52	11.98	7/11/2005	$ 1,219.44	$ 5,016.55	W	7/12/2005	11.98	$ 14,610.07
2/11/2004	$ 1,157.76	$ 73,461.39	63.45	6/13/2006	$ 1,223.69	$ 4,183.34	W	6/14/2006	63.45	$ 77,644.73
8/12/2004	$ 1,063.23	$ 35,941.51	33.80	12/13/2006	$ 1,413.21	$ 11,830.75	W	12/14/2006	33.80	$ 47,772.26
3/7/2005	$ 1,225.31	$ 129,700.05	105.85	7/8/2007	$ 1,530.44	$ 32,298.24	W	7/9/2007	105.85	$ 161,998.29
4/20/2005	$ 1,137.50	$ 56,625.75	49.78	8/21/2007	$ 1,447.12	$ 15,413.16	W	8/22/2007	49.78	$ 72,038.91
8/3/2005	$ 1,245.04	$ 25,113.99	20.17	12/4/2007	$ 1,462.79	$ 4,392.29	W	12/5/2007	20.17	$ 29,506.28
10/13/2005	$ 1,176.84	$ 6,278.50	5.34	2/13/2008	$ 1,367.21	$ 1,015.63	W	2/14/2008	5.34	$ 7,294.13
5/5/2006	$ 1,325.76	$ 1,569.62	1.18	9/4/2008	$ 1,236.83	$ -105.29	L	9/5/2008	1.18	$ 1,464.34
6/13/2006	$ 1,223.69	$ 392.41	0.32	10/13/2008	$ 1,003.35	$ -70.66	L	10/14/2008	0.32	$ 321.75
3/5/2007	$ 1,374.12	$ 94,160.85	68.52	7/5/2009	$ 896.42	$ -32,734.14	L	7/6/2009	68.52	$ 61,426.71
8/15/2007	$ 1,406.70	$ 145,038.93	103.11	12/15/2009	$ 1,107.93	$ -30,804.91	L	12/16/2009	103.11	$ 114,234.02
10/9/2007	$ 1,565.15	$ 90,288.91	57.69	2/8/2010	$ 1,056.74	$ -29,328.68	L	2/9/2010	57.69	$ 60,960.23
3/10/2008	$ 1,273.37	$ 50,172.53	39.40	7/11/2010	$ 1,077.96	$ -7,699.42	L	7/12/2010	39.40	$ 42,473.11
5/19/2008	$ 1,426.63	$ 12,543.13	8.79	9/19/2010	$ 1,125.59	$ -2,646.79	L	9/20/2010	8.79	$ 9,896.35
11/20/2008	$ 752.44	$ 4,475.35	5.95	3/23/2011	$ 1,297.54	$ 3,242.13	W	3/24/2011	5.95	$ 7,717.48
3/9/2009	$ 676.53	$ 1,118.84	1.65	7/10/2011	$ 1,343.80	$ 1,103.52	W	7/11/2011	1.65	$ 2,222.36
2/8/2010	$ 1,056.74	$ 132,025.25	124.94	6/10/2012	$ 1,325.66	$ 33,597.89	W	6/11/2012	124.94	$ 165,623.14
4/23/2010	$ 1,217.28	$ 78,726.49	64.67	8/23/2012	$ 1,402.08	$ 11,951.77	W	8/24/2012	64.67	$ 90,678.25
7/2/2010	$ 1,022.58	$ 19,681.62	19.25	11/1/2012	$ 1,427.59	$ 7,795.24	W	11/2/2012	19.25	$ 27,476.86
4/29/2011	$ 1,363.61	$ 49,985.61	36.66	8/29/2013	$ 1,638.17	$ 10,064.50	W	8/30/2013	36.66	$ 60,050.11
10/3/2011	$ 1,099.23	$ 14,163.17	12.88	2/2/2014	$ 1,782.59	$ 8,804.84	W	2/3/2014	12.88	$ 22,968.01
4/2/2012	$ 1,419.04	$ 3,540.79	2.50	8/3/2014	$ 1,925.15	$ 1,262.85	W	8/4/2014	2.50	$ 4,803.64
6/1/2012	$ 1,278.04	$ 885.20	0.69	10/2/2014	$ 1,946.17	$ 462.76	W	10/3/2014	0.69	$ 1,347.96
9/14/2012	$ 1,465.77	$ 192,447.35	131.29	1/15/2015	$ 1,992.67	$ 69,179.01	W	1/16/2015	131.29	$ 261,626.35
11/15/2012	$ 1,353.33	$ 68,719.48	50.78	3/18/2015	$ 2,099.50	$ 37,889.07	W	3/19/2015	50.78	$ 106,608.55
2/3/2014	$ 1,741.89	$ 62,217.45	35.72	6/5/2016	$ 2,099.13	$ 12,760.02	W	6/6/2016	35.72	$ 74,977.47
10/15/2014	$ 1,862.49	$ 37,394.07	20.08	2/14/2017	$ 2,337.58	$ 9,538.60	W	2/15/2017	20.08	$ 46,932.67
5/21/2015	$ 2,130.82	$ 285,524.70	134.00	9/20/2017	$ 2,508.24	$ 50,573.35	W	9/21/2017	134.00	$ 336,098.05
8/25/2015	$ 1,867.61	$ 71,381.17	38.22	12/25/2017	$ 2,683.34	$ 31,177.69	W	12/26/2017	38.22	$ 102,558.87
11/3/2015	$ 2,109.79	$ 17,845.29	8.46	3/5/2018	$ 2,720.94	$ 5,169.31	W	3/6/2018	8.46	$ 23,014.60
2/11/2016	$ 1,829.08	$ 4,461.32	2.44	6/13/2018	$ 2,775.63	$ 2,308.74	W	1/0/1900	2.44	$ 6,770.06
6/27/2016	$ 2,000.54	$ 57,348.43	28.67	10/28/2018	$ 2,717.07	$ 20,540.39	W	1/0/1900	28.67	$ 77,888.83
8/15/2016	$ 2,190.15	$ 14,337.11	6.55	12/16/2018	$ 2,717.07	$ 3,449.31	W	1/0/1900	6.55	$ 17,786.42
11/4/2016	$ 2,085.18	$ 3,584.28	1.72	3/7/2019	$ 2,717.07	$ 1,086.17	W	1/0/1900	1.72	$ 4,670.45
1/26/2018	$ 2,872.87	$ 36,095.58	12.56	5/28/2020	$ 2,717.07	$ -1,957.52	L	1/0/1900	12.56	$ 34,138.06
6/12/2018	$ 2,786.85	$ 9,023.89	3.24	10/12/2020	$ 2,717.07	$ -225.95	L	1/0/1900	3.24	$ 8,797.94

Table 49: Detail of trades made under the 632-day Maximizer S&P 500 Strategy

LONG TRADES										
Trade Date	Price	Trade $	Trade Units	Close Date	Price	Close $	W/L	Settled		Settled $
		$ 3,526,710.26				$ 456,981.24				$ 3,983,691.50
6/12/1950	$ 19.40	$ 7,500.00	386.60	3/5/1952	$ 23.71	$ 1,666.24	W	3/6/1952	386.60	$ 9,166.24
7/17/1950	$ 16.68	$ 1,875.00	112.41	4/9/1952	$ 23.94	$ 816.10	W	4/10/1952	112.41	$ 2,691.10
5/3/1951	$ 22.81	$ 468.75	20.55	1/24/1953	$ 26.07	$ 66.99	W	1/26/1953	20.55	$ 535.74
6/29/1951	$ 20.96	$ 117.19	5.59	3/22/1953	$ 26.18	$ 29.19	W	3/23/1953	5.59	$ 146.37
11/23/1951	$ 22.40	$ 29.30	1.31	8/16/1953	$ 24.62	$ 2.90	W	8/17/1953	1.31	$ 32.20
1/22/1952	$ 24.66	$ 7.32	0.30	10/15/1953	$ 23.95	$ -0.21	L	10/16/1953	0.30	$ 7.11
8/8/1952	$ 25.55	$ 8,894.83	348.13	5/2/1954	$ 28.26	$ 943.44	W	5/3/1954	348.13	$ 9,838.28
10/22/1952	$ 23.80	$ 2,223.71	93.43	7/16/1954	$ 30.06	$ 584.89	W	7/19/1954	93.43	$ 2,808.60
1/5/1953	$ 26.66	$ 555.93	20.85	9/29/1954	$ 32.50	$ 121.78	W	9/30/1954	20.85	$ 677.71
9/14/1953	$ 22.51	$ 674.72	29.71	6/8/1955	$ 39.22	$ 490.52	W	6/9/1955	29.71	$ 1,165.24
10/11/1955	$ 40.80	$ 11,041.38	270.62	7/4/1957	$ 48.46	$ 2,072.96	W	7/5/1957	270.62	$ 13,114.34
11/14/1955	$ 46.41	$ 2,760.34	59.48	8/7/1957	$ 47.03	$ 36.88	W	8/8/1957	59.48	$ 2,797.22
3/20/1956	$ 48.87	$ 690.09	14.12	12/12/1957	$ 40.55	$ -117.49	L	12/13/1957	14.12	$ 572.60
5/28/1956	$ 44.10	$ 172.52	3.91	2/19/1958	$ 41.15	$ -11.54	L	2/20/1958	3.91	$ 160.98
8/2/1956	$ 49.64	$ 43.13	0.87	4/26/1958	$ 43.36	$ -5.46	L	4/28/1958	0.87	$ 37.67
8/3/1956	$ 49.64	$ 10.78	0.22	4/27/1958	$ 43.36	$ -1.36	L	4/28/1958	0.22	$ 9.42
2/12/1957	$ 42.39	$ 2.70	0.06	11/6/1958	$ 52.45	$ 0.64	W	11/7/1958	0.06	$ 3.34
7/15/1957	$ 49.13	$ 9,836.43	200.21	4/8/1959	$ 56.21	$ 1,417.50	W	4/9/1959	200.21	$ 11,253.93
10/22/1957	$ 38.98	$ 4,557.02	116.91	7/16/1959	$ 59.41	$ 2,388.40	W	7/17/1959	116.91	$ 6,945.43
8/3/1959	$ 60.71	$ 15,348.53	252.82	4/26/1961	$ 65.55	$ 1,223.64	W	4/27/1961	252.82	$ 16,572.16
9/22/1959	$ 55.14	$ 3,837.13	69.59	6/15/1961	$ 65.69	$ 734.16	W	6/16/1961	69.59	$ 4,571.29
1/5/1960	$ 60.39	$ 959.28	15.88	9/28/1961	$ 66.58	$ 98.33	W	9/29/1961	15.88	$ 1,057.61
3/8/1960	$ 53.47	$ 239.82	4.49	11/30/1961	$ 71.32	$ 80.06	W	12/1/1961	4.49	$ 319.88
8/24/1960	$ 58.07	$ 59.96	1.03	5/18/1962	$ 63.82	$ 5.94	W	5/21/1962	1.03	$ 65.89
10/25/1960	$ 52.20	$ 14.99	0.29	7/19/1962	$ 56.42	$ 1.21	W	7/20/1962	0.29	$ 16.20
4/17/1961	$ 68.68	$ 3.75	0.05	1/9/1963	$ 64.59	$ -0.22	L	1/10/1963	0.05	$ 3.52
12/12/1961	$ 72.64	$ 16,891.65	232.54	9/5/1963	$ 73.00	$ 83.71	W	9/6/1963	232.54	$ 16,975.36
6/26/1962	$ 52.32	$ 4,272.33	81.66	3/19/1964	$ 79.30	$ 2,203.12	W	3/20/1964	81.66	$ 6,475.46
10/23/1962	$ 53.49	$ 1,080.23	20.20	7/16/1964	$ 83.64	$ 608.88	W	7/17/1964	20.20	$ 1,689.11
7/22/1963	$ 67.90	$ 272.70	4.02	4/14/1965	$ 88.24	$ 81.69	W	4/15/1965	4.02	$ 354.39
11/22/1963	$ 69.61	$ 12,799.70	183.88	8/15/1965	$ 86.77	$ 3,155.33	W	8/16/1965	183.88	$ 15,955.03
12/15/1964	$ 83.22	$ 9,323.35	112.03	9/8/1966	$ 76.05	$ -803.27	L	9/9/1966	112.03	$ 8,520.08
5/13/1965	$ 90.27	$ 2,596.63	28.77	2/4/1967	$ 87.36	$ -83.71	L	2/6/1967	28.77	$ 2,512.92
6/28/1965	$ 81.60	$ 649.16	7.96	3/22/1967	$ 90.25	$ 68.81	W	3/23/1967	7.96	$ 717.97
2/9/1966	$ 94.06	$ 12,128.56	128.94	11/3/1967	$ 91.78	$ -293.99	L	11/6/1967	128.94	$ 11,834.57
10/7/1966	$ 73.20	$ 9,422.20	128.72	6/30/1968	$ 99.58	$ 3,395.60	W	7/1/1968	128.72	$ 12,817.79
9/25/1967	$ 97.59	$ 4,778.72	48.97	6/18/1969	$ 97.81	$ 10.77	W	6/19/1969	48.97	$ 4,789.49
11/8/1967	$ 91.14	$ 10,070.61	110.50	8/1/1969	$ 93.47	$ 257.46	W	8/4/1969	110.50	$ 10,328.06
1/12/1968	$ 96.72	$ 2,517.65	26.03	10/5/1969	$ 93.19	$ -91.89	L	10/6/1969	26.03	$ 2,425.76
3/5/1968	$ 87.72	$ 629.41	7.18	11/27/1969	$ 93.27	$ 39.82	W	11/28/1969	7.18	$ 669.24
11/29/1968	$ 108.37	$ 9,770.70	90.16	8/23/1970	$ 79.24	$ -2,626.38	L	8/24/1970	90.16	$ 7,144.32
2/25/1969	$ 97.98	$ 2,442.67	24.93	11/19/1970	$ 82.91	$ -375.70	L	11/20/1970	24.93	$ 2,066.97
5/14/1969	$ 106.16	$ 610.67	5.75	2/5/1971	$ 96.93	$ -53.09	L	2/8/1971	5.75	$ 557.57
7/29/1969	$ 89.48	$ 3,744.79	41.85	4/22/1971	$ 103.56	$ 589.26	W	4/23/1971	41.85	$ 4,334.04
11/10/1969	$ 98.33	$ 10,501.57	106.80	8/4/1971	$ 93.89	$ -474.19	L	8/5/1971	106.80	$ 10,027.38
5/26/1970	$ 69.29	$ 3,127.32	45.13	2/17/1972	$ 105.59	$ 1,638.36	W	2/18/1972	45.13	$ 4,765.67
4/28/1971	$ 104.77	$ 11,359.02	108.42	1/19/1973	$ 118.78	$ 1,518.94	W	1/22/1973	108.42	$ 12,877.96
9/8/1971	$ 101.34	$ 10,360.29	102.23	6/1/1973	$ 103.93	$ 264.78	W	6/4/1973	102.23	$ 10,625.07
11/23/1971	$ 90.16	$ 2,590.07	28.73	8/16/1973	$ 102.29	$ 348.46	W	8/17/1973	28.73	$ 2,938.54
1/11/1973	$ 120.24	$ 4,221.77	35.11	10/5/1974	$ 62.34	$ -2,032.94	L	10/7/1974	35.11	$ 2,188.83
8/22/1973	$ 100.53	$ 20,886.62	207.77	5/16/1975	$ 90.43	$ -2,098.43	L	5/19/1975	207.77	$ 18,788.19
10/12/1973	$ 111.44	$ 5,221.65	46.86	7/6/1975	$ 94.36	$ -800.30	L	7/7/1975	46.86	$ 4,421.35
10/3/1974	$ 62.28	$ 1,305.41	20.96	6/26/1976	$ 103.72	$ 868.60	W	6/28/1976	20.96	$ 2,174.01
7/15/1975	$ 95.61	$ 19,375.14	202.65	4/7/1977	$ 98.35	$ 555.25	W	4/11/1977	202.65	$ 19,930.39
9/16/1975	$ 82.09	$ 4,843.78	59.01	6/9/1977	$ 98.14	$ 947.04	W	6/10/1977	59.01	$ 5,790.83
6/7/1976	$ 98.63	$ 1,210.95	12.28	3/1/1978	$ 87.19	$ -140.46	L	3/2/1978	12.28	$ 1,070.49
9/21/1976	$ 107.83	$ 1,933.25	17.93	6/15/1978	$ 98.34	$ -170.14	L	6/16/1978	17.93	$ 1,763.10
11/10/1976	$ 98.81	$ 483.31	4.89	8/4/1978	$ 103.92	$ 24.99	W	8/7/1978	4.89	$ 508.31
12/31/1976	$ 107.46	$ 120.83	1.12	9/24/1978	$ 101.84	$ -6.32	L	9/25/1978	1.12	$ 114.51
7/19/1977	$ 101.79	$ 19,321.12	189.81	4/12/1979	$ 102.00	$ 39.86	W	4/16/1979	189.81	$ 19,360.98
3/6/1978	$ 86.90	$ 5,633.15	64.82	11/28/1979	$ 106.77	$ 1,288.04	W	11/29/1979	64.82	$ 6,921.19
9/12/1978	$ 106.99	$ 3,111.84	29.09	6/5/1980	$ 112.78	$ 168.40	W	6/6/1980	29.09	$ 3,280.25
11/14/1978	$ 92.49	$ 863.84	9.34	8/7/1980	$ 123.30	$ 287.76	W	8/8/1980	9.34	$ 1,151.60
10/5/1979	$ 111.27	$ 14,736.70	132.44	6/28/1981	$ 132.56	$ 2,819.67	W	6/29/1981	132.44	$ 17,556.36
11/7/1979	$ 99.87	$ 3,684.17	36.89	7/31/1981	$ 130.92	$ 1,145.42	W	8/3/1981	36.89	$ 4,829.60
2/13/1980	$ 118.44	$ 6,111.93	51.60	11/6/1981	$ 122.67	$ 218.28	W	11/9/1981	51.60	$ 6,330.22
3/27/1980	$ 98.22	$ 1,527.98	15.56	12/19/1981	$ 124.00	$ 401.05	W	12/21/1981	15.56	$ 1,929.04
11/28/1980	$ 140.52	$ 3,705.88	26.37	8/22/1982	$ 113.02	$ -725.25	L	8/23/1982	26.37	$ 2,980.64
2/20/1981	$ 126.58	$ 926.47	7.32	11/14/1982	$ 139.53	$ 94.78	W	11/15/1982	7.32	$ 1,021.26
8/11/1981	$ 133.85	$ 17,021.09	127.17	5/5/1983	$ 164.28	$ 3,869.64	W	5/6/1983	127.17	$ 20,890.73
9/25/1981	$ 112.77	$ 4,255.27	37.73	6/19/1983	$ 169.13	$ 2,126.69	W	6/20/1983	37.73	$ 6,381.97
11/30/1981	$ 126.35	$ 5,811.48	46.00	8/24/1983	$ 161.25	$ 1,605.23	W	8/25/1983	46.00	$ 7,416.71
3/8/1982	$ 107.34	$ 2,899.65	27.01	11/30/1983	$ 166.40	$ 1,595.43	W	12/1/1983	27.01	$ 4,495.07
5/7/1982	$ 119.47	$ 724.91	6.07	1/29/1984	$ 163.94	$ 269.83	W	1/30/1984	6.07	$ 994.74
8/12/1982	$ 102.42	$ 181.23	1.77	5/5/1984	$ 159.11	$ 100.31	W	5/7/1984	1.77	$ 281.54
6/22/1983	$ 170.99	$ 23,501.25	137.44	3/15/1985	$ 176.53	$ 761.43	W	3/18/1985	137.44	$ 24,262.68
8/8/1983	$ 159.18	$ 5,875.31	36.91	5/1/1985	$ 178.37	$ 708.30	W	5/2/1985	36.91	$ 6,583.61
10/10/1983	$ 172.65	$ 7,031.36	40.73	7/3/1985	$ 191.45	$ 765.65	W	7/5/1985	40.73	$ 7,797.01
2/23/1984	$ 154.29	$ 5,875.20	38.08	11/16/1985	$ 198.11	$ 1,668.62	W	11/18/1985	38.08	$ 7,543.82
7/24/1984	$ 147.82	$ 1,679.95	11.36	4/17/1986	$ 243.03	$ 1,082.05	W	4/18/1986	11.36	$ 2,762.00
7/17/1985	$ 195.65	$ 29,402.46	150.28	4/10/1987	$ 292.49	$ 14,553.20	W	4/13/1987	150.28	$ 43,955.67
9/25/1985	$ 180.66	$ 7,350.62	40.69	6/19/1987	$ 306.97	$ 5,139.25	W	6/22/1987	40.69	$ 12,489.86
9/4/1986	$ 253.83	$ 9,567.02	37.69	5/28/1988	$ 253.42	$ -15.45	L	5/31/1988	37.69	$ 9,551.57
9/29/1986	$ 229.91	$ 2,391.76	10.40	6/22/1988	$ 275.66	$ 475.94	W	6/23/1988	10.40	$ 2,867.69
5/20/1987	$ 278.21	$ 33,564.69	120.65	2/10/1989	$ 292.02	$ 1,666.11	W	2/13/1989	120.65	$ 35,230.80
8/25/1987	$ 336.77	$ 17,758.57	52.73	5/18/1989	$ 317.97	$ -991.36	L	5/19/1989	52.73	$ 16,767.21
12/4/1987	$ 223.92	$ 4,439.64	19.83	8/27/1989	$ 350.52	$ 2,510.09	W	8/28/1989	19.83	$ 6,949.73
5/23/1988	$ 250.83	$ 1,109.91	4.42	2/14/1990	$ 332.01	$ 359.22	W	2/15/1990	4.42	$ 1,469.13
7/5/1988	$ 275.81	$ 9,591.93	34.78	3/29/1990	$ 340.79	$ 2,259.83	W	3/30/1990	34.78	$ 11,851.76
10/9/1989	$ 359.80	$ 46,608.78	129.54	7/3/1991	$ 373.33	$ 1,752.69	W	7/5/1991	129.54	$ 48,361.47
1/30/1990	$ 322.98	$ 11,652.20	36.08	10/24/1991	$ 385.07	$ 2,240.03	W	10/25/1991	36.08	$ 13,892.23
7/16/1990	$ 368.95	$ 12,903.71	34.97	4/8/1992	$ 394.50	$ 893.59	W	4/9/1992	34.97	$ 13,797.30
10/11/1990	$ 295.46	$ 3,225.93	10.92	7/4/1992	$ 411.77	$ 1,269.91	W	7/6/1992	10.92	$ 4,495.84
4/17/1991	$ 390.45	$ 806.48	2.07	1/8/1993	$ 429.05	$ 79.73	W	1/11/1993	2.07	$ 886.21
11/29/1991	$ 375.22	$ 46,891.89	124.97	8/22/1993	$ 456.16	$ 10,115.21	W	8/23/1993	124.97	$ 57,007.10
1/15/1992	$ 420.77	$ 11,722.97	27.86	10/8/1993	$ 460.31	$ 1,101.61	W	10/11/1993	27.86	$ 12,824.59
4/8/1992	$ 394.50	$ 2,930.74	7.43	12/31/1993	$ 466.45	$ 534.52	W	1/3/1994	7.43	$ 3,465.26
7/15/1992	$ 442.64	$ 14,452.54	35.89	7/1/1994	$ 446.20	$ 1,562.77	W	7/5/1994	35.89	$ 16,015.31
3/10/1993	$ 456.33	$ 4,277.79	9.37	12/2/1994	$ 453.30	$ -28.40	L	12/5/1994	9.37	$ 4,249.39
2/2/1994	$ 482.00	$ 56,042.16	116.27	10/27/1995	$ 579.70	$ 11,359.58	W	10/30/1995	116.27	$ 67,401.75
4/4/1994	$ 438.92	$ 14,010.54	31.92	12/27/1995	$ 614.53	$ 5,605.56	W	12/28/1995	31.92	$ 19,616.10
8/30/1994	$ 476.07	$ 15,514.12	32.59	5/23/1996	$ 676.00	$ 6,515.30	W	5/24/1996	32.59	$ 22,029.41
12/8/1994	$ 445.45	$ 7,065.57	15.86	8/31/1996	$ 651.99	$ 3,276.06	W	9/3/1996	15.86	$ 10,341.63
2/12/1996	$ 661.45	$ 67,029.78	101.34	11/5/1997	$ 942.76	$ 28,507.29	W	11/6/1997	101.34	$ 95,537.07
5/24/1996	$ 678.51	$ 16,757.44	24.70	2/15/1998	$ 1,020.09	$ 8,436.14	W	2/17/1998	24.70	$ 25,193.59
7/24/1996	$ 626.65	$ 20,711.42	33.05	4/17/1998	$ 1,122.72	$ 16,395.62	W	4/20/1998	33.05	$ 37,107.04
4/11/1997	$ 737.65	$ 12,934.08	17.53	1/3/1999	$ 1,229.23	$ 8,619.45	W	1/4/1999	17.53	$ 21,553.53
10/27/1997	$ 876.99	$ 3,233.52	3.69	7/21/1999	$ 1,379.29	$ 1,852.01	W	7/22/1999	3.69	$ 5,085.53
7/17/1998	$ 1,186.75	$ 119,186.65	100.43	4/9/2000	$ 1,516.35	$ 33,102.10	W	4/10/2000	100.43	$ 152,288.75
8/31/1998	$ 957.28	$ 29,796.66	31.13	5/24/2000	$ 1,399.05	$ 13,750.70	W	5/25/2000	31.13	$ 43,547.36
7/16/1999	$ 1,418.78	$ 23,614.31	16.64	4/8/2001	$ 1,128.43	$ -4,832.61	L	4/9/2001	16.64	$ 18,781.70
10/15/1999	$ 1,247.41	$ 9,717.73	7.79	7/8/2001	$ 1,190.59	$ -442.65	L	7/9/2001	7.79	$ 9,275.08
2/25/2000	$ 1,333.36	$ 2,429.43	1.82	11/18/2001	$ 1,138.65	$ -354.77	L	11/19/2001	1.82	$ 2,074.66
3/24/2000	$ 1,527.46	$ 607.36	0.40	12/16/2001	$ 1,123.09	$ -160.79	L	12/17/2001	0.40	$ 446.57
9/1/2000	$ 1,520.77	$ 147,028.92	96.68	5/26/2002	$ 1,083.82	$ -42,244.58	L	5/28/2002	96.68	$ 104,784.34
4/4/2001	$ 1,103.25	$ 36,757.23	33.32	12/27/2002	$ 875.40	$ -7,591.33	L	12/30/2002	33.32	$ 29,165.90
5/21/2001	$ 1,312.83	$ 23,275.58	17.73	2/12/2003	$ 818.68	$ -8,760.94	L	2/13/2003	17.73	$ 14,514.64
9/21/2001	$ 965.80	$ 12,775.21	13.23	6/15/2003	$ 988.61	$ 301.72	W	6/16/2003	13.23	$ 13,076.93
1/4/2002	$ 1,172.51	$ 5,084.73	4.34	9/28/2003	$ 996.85	$ -761.77	L	9/29/2003	4.34	$ 4,322.96
10/9/2002	$ 776.76	$ 79,859.43	102.81	7/2/2004	$ 1,125.38	$ 35,841.95	W	7/6/2004	102.81	$ 115,701.39
11/27/2002	$ 938.87	$ 19,964.86	21.26	8/20/2004	$ 1,098.35	$ 3,391.31	W	8/23/2004	21.26	$ 23,356.16
3/11/2003	$ 800.73	$ 37,751.62	47.15	12/2/2004	$ 1,190.33	$ 18,368.28	W	12/3/2004	47.15	$ 56,119.90
2/11/2004	$ 1,157.76	$ 22,487.82	19.42	11/4/2005	$ 1,220.14	$ 1,211.64	W	11/7/2005	19.42	$ 23,699.46
8/12/2004	$ 1,063.23	$ 92,397.99	86.90	5/6/2006	$ 1,325.76	$ 22,814.68	W	5/8/2006	86.90	$ 115,212.67
3/7/2005	$ 1,225.31	$ 82,706.54	67.50	11/29/2006	$ 1,399.48	$ 11,756.20	W	11/30/2006	67.50	$ 94,462.75
4/20/2005	$ 1,137.50	$ 20,676.64	18.18	1/12/2007	$ 1,430.73	$ 5,330.12	W	1/16/2007	18.18	$ 26,006.75
8/3/2005	$ 1,245.04	$ 5,169.16	4.15	4/27/2007	$ 1,494.07	$ 1,033.92	W	4/30/2007	4.15	$ 6,203.08
10/13/2005	$ 1,176.84	$ 1,292.29	1.10	7/7/2007	$ 1,530.44	$ 388.29	W	7/9/2007	1.10	$ 1,680.58
5/5/2006	$ 1,325.76	$ 18,097.67	13.65	1/27/2008	$ 1,330.61	$ 66.21	W	1/28/2008	13.65	$ 18,163.87
6/13/2006	$ 1,223.69	$ 90,933.92	74.31	3/6/2008	$ 1,304.34	$ 5,993.20	W	3/7/2008	74.31	$ 96,927.12
3/5/2007	$ 1,374.12	$ 113,085.60	82.30	11/26/2008	$ 887.68	$ -40,032.43	L	11/28/2008	82.30	$ 73,053.18
8/15/2007	$ 1,406.70	$ 34,184.15	24.30	5/8/2009	$ 929.23	$ -11,602.97	L	5/11/2009	24.30	$ 22,581.17
10/9/2007	$ 1,565.15	$ 8,546.04	5.46	7/2/2009	$ 896.42	$ -3,651.40	L	7/6/2009	5.46	$ 4,894.63
3/10/2008	$ 1,273.37	$ 88,454.76	69.47	12/2/2009	$ 1,109.24	$ 11,401.30	L	12/3/2009	69.47	$ 77,053.45
5/19/2008	$ 1,426.63	$ 22,113.69	15.50	2/10/2010	$ 1,068.13	$ -5,556.98	L	2/11/2010	15.50	$ 16,556.71
11/20/2008	$ 752.44	$ 5,528.42	7.35	8/14/2010	$ 1,079.25	$ 2,401.18	W	8/16/2010	7.35	$ 7,929.60
3/9/2009	$ 676.53	$ 56,171.99	83.03	12/1/2010	$ 1,206.07	$ 43,967.46	W	12/2/2010	83.03	$ 100,139.45
2/8/2010	$ 1,056.74	$ 92,439.94	87.48	11/2/2011	$ 1,237.90	$ 15,847.25	W	11/3/2011	87.48	$ 108,287.19
4/23/2010	$ 1,217.28	$ 35,527.52	29.19	1/15/2012	$ 1,289.09	$ 2,095.84	W	1/17/2012	29.19	$ 37,623.36
7/2/2010	$ 1,022.58	$ 8,881.88	8.69	3/25/2012	$ 1,397.11	$ 3,253.08	W	3/26/2012	8.69	$ 12,134.95
4/29/2011	$ 1,363.61	$ 83,272.26	61.07	1/20/2013	$ 1,485.98	$ 7,472.83	W	1/22/2013	61.07	$ 90,745.09
10/3/2011	$ 1,099.23	$ 20,818.06	18.94	6/26/2013	$ 1,603.26	$ 9,545.71	W	6/27/2013	18.94	$ 30,363.77
4/2/2012	$ 1,419.04	$ 123,738.64	87.20	12/25/2013	$ 1,833.32	$ 36,124.73	W	12/26/2013	87.20	$ 159,863.37
6/1/2012	$ 1,278.04	$ 30,934.66	24.20	2/23/2014	$ 1,836.25	$ 13,511.34	W	2/24/2014	24.20	$ 44,446.00
9/14/2012	$ 1,465.77	$ 7,733.67	5.28	6/8/2014	$ 1,949.44	$ 2,551.93	W	6/9/2014	5.28	$ 10,285.59
11/15/2012	$ 1,353.33	$ 1,933.42	1.43	8/9/2014	$ 1,931.59	$ 826.12	W	8/11/2014	1.43	$ 2,759.54
2/3/2014	$ 1,741.89	$ 211,212.53	121.25	10/28/2015	$ 2,090.35	$ 42,252.46	W	10/29/2015	121.25	$ 253,464.99
10/15/2014	$ 1,862.49	$ 95,921.49	51.50	7/8/2016	$ 2,129.90	$ 13,772.08	W	7/11/2016	51.50	$ 109,693.56
5/21/2015	$ 2,130.82	$ 23,980.37	11.25	2/11/2017	$ 2,316.10	$ 2,085.15	W	2/13/2017	11.25	$ 26,065.52
8/25/2015	$ 1,867.61	$ 5,995.09	3.21	5/18/2017	$ 2,365.72	$ 1,598.95	W	5/19/2017	3.21	$ 7,594.04
11/3/2015	$ 2,109.79	$ 191,597.51	90.81	7/27/2017	$ 2,475.42	$ 33,204.15	W	7/28/2017	90.81	$ 224,801.66
2/11/2016	$ 1,829.08	$ 47,899.38	26.19	11/4/2017	$ 2,587.84	$ 19,870.18	W	11/6/2017	26.19	$ 67,769.55
6/27/2016	$ 2,000.54	$ 11,974.84	5.99	3/21/2018	$ 2,711.93	$ 4,258.24	W	3/22/2018	5.99	$ 16,233.09
8/15/2016	$ 2,190.15	$ 85,263.88	38.93	5/9/2018	$ 2,697.79	$ 19,762.74	W	1/0/1900	38.93	$ 105,026.63
11/4/2016	$ 2,085.18	$ 21,315.97	10.22	7/29/2018	$ 2,717.07	$ 6,459.56	W	1/0/1900	10.22	$ 27,775.53
1/26/2018	$ 2,872.87	$ 250,002.08	87.02	10/20/2019	$ 2,717.07	$ -13,557.99	L	1/0/1900	87.02	$ 236,444.09
6/12/2018	$ 2,786.85	$ 74,675.33	26.80	3/5/2020	$ 2,717.07	$ -1,869.80	L	1/0/1900	26.80	$ 72,805.54

Table 50: Cycles for DJIA Quarters based on a cycle length of 30.6 quarters

	30.632156														
6/28/1901	2/23/1909	10/21/1916	6/18/1924	2/14/1932	10/12/1939	6/9/1947	2/4/1955	10/2/1962	5/30/1970	1/25/1978	9/23/1985	5/21/1993	1/16/2001	9/13/2008	5/11/2016
9/30/1903	5/28/1911	1/23/1919	9/20/1926	5/18/1934	1/13/1942	9/10/1949	5/8/1957	1/3/1965	8/31/1972	4/28/1980	12/26/1987	8/23/1995	4/20/2003	12/16/2010	
3/30/1906	11/25/1913	7/23/1921	3/20/1929	11/15/1936	7/13/1944	3/10/1952	11/6/1959	7/4/1967	3/1/1975	10/27/1982	6/25/1990	2/20/1998	10/18/2005	6/15/2013	
12/31/1907	8/28/1915	4/25/1923	12/21/1930	8/18/1938	4/15/1946	12/11/1953	8/8/1961	4/5/1969	12/1/1976	7/29/1984	3/27/1992	11/23/1999	7/21/2007	3/18/2015	
9/30/1909	5/28/1917	1/23/1925	9/20/1932	5/18/1940	1/14/1948	9/11/1955	5/9/1963	1/4/1971	9/1/1978	4/29/1986	12/26/1993	8/23/2001	4/20/2009	12/16/2016	
9/30/1910	5/28/1918	1/23/1926	9/20/1933	5/18/1941	1/13/1949	9/10/1956	5/8/1964	1/4/1972	9/1/1979	4/29/1987	12/26/1994	8/23/2002	4/20/2010	12/16/2017	
9/29/1911	5/27/1919	1/22/1927	9/19/1934	5/17/1942	1/12/1950	9/9/1957	5/7/1965	1/2/1973	8/30/1980	4/27/1988	12/25/1995	8/22/2003	4/19/2011		
9/30/1912	5/28/1920	1/24/1928	9/21/1935	5/19/1943	1/14/1951	9/11/1958	5/9/1966	1/4/1974	9/1/1981	4/29/1989	12/26/1996	8/23/2004	4/20/2012		
6/30/1913	2/25/1921	10/23/1928	6/20/1936	2/16/1944	10/14/1951	6/11/1959	2/6/1967	10/4/1974	6/1/1982	1/27/1990	9/25/1997	5/23/2005	1/18/2013		
3/31/1914	11/26/1921	7/24/1929	3/21/1937	11/16/1944	7/14/1952	3/11/1960	11/7/1967	7/5/1975	3/2/1983	10/28/1990	6/26/1998	2/21/2006	10/19/2013		
12/31/1914	8/28/1922	4/25/1930	12/21/1937	8/18/1945	4/15/1953	12/11/1960	8/8/1968	4/5/1976	12/2/1983	7/30/1991	3/28/1999	11/23/2006	7/21/2014		
6/30/1916	2/26/1924	10/24/1931	6/21/1939	2/16/1947	10/14/1954	6/11/1962	2/6/1970	10/4/1977	6/1/1985	1/27/1993	9/25/2000	5/23/2008	1/19/2016		
9/29/1916	5/27/1924	1/23/1932	9/20/1939	5/18/1947	1/13/1955	9/10/1962	5/8/1970	1/3/1978	8/31/1985	4/28/1993	12/25/2000	8/22/2008	4/19/2016		
12/31/1917	8/28/1925	4/25/1933	12/21/1940	8/18/1948	4/15/1956	12/12/1963	8/9/1971	4/6/1979	12/2/1986	7/30/1994	3/28/2002	11/23/2009	7/21/2017		
9/30/1919	5/28/1927	1/23/1935	9/20/1942	5/18/1950	1/13/1958	9/10/1965	5/8/1973	1/3/1981	8/31/1988	4/28/1996	12/26/2003	8/23/2011			
6/30/1921	2/25/1929	10/23/1936	6/20/1944	2/16/1952	10/14/1959	6/11/1967	2/6/1975	10/4/1982	6/1/1990	1/27/1998	9/25/2005	5/23/2013			
3/30/1923	11/25/1930	7/23/1938	3/20/1946	11/15/1953	7/13/1961	3/10/1969	11/5/1976	7/3/1984	2/29/1992	10/27/1999	6/25/2007	2/20/2015			
9/28/1923	5/26/1931	1/21/1939	9/18/1946	5/16/1954	1/11/1962	9/8/1969	5/6/1977	1/1/1985	8/29/1992	4/26/2000	12/24/2007	8/21/2015			
9/30/1929	5/28/1937	1/23/1945	9/20/1952	5/18/1960	1/14/1968	9/11/1975	5/9/1983	1/4/1991	9/1/1998	4/29/2006	12/26/2013				
6/30/1932	2/26/1940	10/24/1947	6/21/1955	2/16/1963	10/14/1970	6/11/1978	2/6/1986	10/4/1993	6/1/2001	1/27/2009	9/25/2016				
9/28/1934	5/26/1942	1/21/1950	9/18/1957	5/16/1965	1/11/1973	9/8/1980	5/6/1988	1/2/1996	8/30/2003	4/27/2011					
3/31/1937	11/26/1944	7/24/1952	3/21/1960	11/17/1967	7/15/1975	3/12/1983	11/7/1990	7/5/1998	3/2/2006	10/28/2013					
3/31/1938	11/26/1945	7/24/1953	3/21/1961	11/16/1968	7/14/1976	3/11/1984	11/7/1991	7/5/1999	3/2/2007	10/28/2014					
12/30/1938	8/27/1946	4/24/1954	12/20/1961	8/17/1969	4/14/1977	12/10/1984	8/7/1992	4/4/2000	12/1/2007	7/29/2015					
6/30/1939	2/25/1947	10/23/1954	6/20/1962	2/15/1970	10/13/1977	6/10/1985	2/5/1993	10/3/2000	5/31/2008	1/27/2016					
6/28/1940	2/24/1948	10/22/1955	6/19/1963	2/14/1971	10/12/1978	6/9/1986	2/4/1994	10/2/2001	5/30/2009	1/25/2017					
3/31/1942	11/26/1949	7/24/1957	3/21/1965	11/16/1972	7/14/1980	3/11/1988	11/7/1995	7/5/2003	3/2/2011						
6/30/1943	2/25/1951	10/23/1958	6/20/1966	2/15/1974	10/13/1981	6/10/1989	2/5/1997	10/3/2004	5/31/2012						
12/31/1943	8/28/1951	4/25/1959	12/21/1966	8/18/1974	4/15/1982	12/11/1989	8/8/1997	4/5/2005	12/1/2012						
6/28/1946	2/23/1954	10/21/1961	6/18/1969	2/13/1977	10/11/1984	6/8/1992	2/4/2000	10/2/2007	5/30/2015						
9/30/1946	5/28/1954	1/23/1962	9/20/1969	5/18/1977	1/13/1985	9/10/1992	5/8/2000	1/4/2008	9/1/2015						
3/31/1948	11/27/1955	7/25/1963	3/22/1971	11/17/1978	7/15/1986	3/12/1994	11/7/2001	7/5/2009	3/2/2017						
6/30/1948	2/26/1956	10/24/1963	6/21/1971	2/16/1979	10/14/1986	6/11/1994	2/6/2002	10/4/2009	6/1/2017						
6/30/1949	2/25/1957	10/23/1964	6/20/1972	2/16/1980	10/14/1987	6/11/1995	2/6/2003	10/4/2010	6/1/2018						
12/31/1952	8/28/1960	4/25/1968	12/22/1975	8/19/1983	4/16/1991	12/12/1998	8/9/2006	4/6/2014							
9/30/1953	5/28/1961	1/23/1969	9/20/1976	5/18/1984	1/14/1992	9/11/1999	5/9/2007	1/4/2015							
3/30/1956	11/26/1963	7/24/1971	3/21/1979	11/16/1986	7/14/1994	3/11/2002	11/6/2009	7/4/2017							
6/28/1957	2/23/1965	10/21/1972	6/18/1980	2/14/1988	10/12/1995	6/9/2003	2/4/2011								
12/31/1957	8/28/1965	4/25/1973	12/21/1980	8/18/1988	4/15/1996	12/12/2003	8/9/2011								
12/31/1959	8/28/1967	4/25/1975	12/21/1982	8/18/1990	4/15/1998	12/11/2005	8/8/2013								
9/30/1960	5/28/1968	1/24/1976	9/21/1983	5/19/1991	1/14/1999	9/11/2006	5/9/2014								
12/29/1961	8/26/1969	4/23/1977	12/19/1984	8/16/1992	4/13/2000	12/10/2007	8/7/2015								
6/29/1962	2/24/1970	10/22/1977	6/19/1985	2/14/1993	10/12/2000	6/9/2008	2/5/2016								
6/30/1965	2/25/1973	10/23/1980	6/20/1988	2/16/1996	10/14/2003	6/11/2011									
12/31/1965	8/28/1973	4/25/1981	12/21/1988	8/18/1996	4/15/2004	12/12/2011									
9/30/1966	5/28/1974	1/23/1982	9/20/1989	5/18/1997	1/13/2005	9/10/2012									
9/29/1967	5/27/1975	1/22/1983	9/19/1990	5/17/1998	1/12/2006	9/9/2013									
3/29/1968	11/25/1975	7/23/1983	3/20/1991	11/15/1998	7/13/2006	3/10/2014									
12/31/1968	8/28/1976	4/25/1984	12/22/1991	8/19/1999	4/16/2007	12/12/2014									
6/30/1970	2/25/1978	10/23/1985	6/20/1993	2/15/2001	10/13/2008	6/10/2016									
3/31/1971	11/26/1978	7/24/1986	3/21/1994	11/16/2001	7/14/2009	3/11/2017									
12/29/1972	8/26/1980	4/23/1988	12/20/1995	8/17/2003	4/14/2011										
9/30/1974	5/28/1982	1/23/1990	9/20/1997	5/18/2005	1/13/2013										
12/31/1976	8/28/1984	4/25/1992	12/22/1999	8/19/2007	4/16/2015										
3/31/1978	11/26/1985	7/24/1993	3/21/2001	11/16/2008	7/14/2016										
9/29/1978	5/27/1986	1/22/1994	9/19/2001	5/17/2009	1/12/2017										
9/28/1979	5/26/1987	1/21/1995	9/18/2002	5/16/2010	1/11/2018										
3/31/1980	11/27/1987	7/25/1995	3/22/2003	11/17/2010	7/15/2018										
3/31/1981	11/26/1988	7/24/1996	3/21/2004	11/17/2011											
6/30/1982	2/25/1990	10/23/1997	6/20/2005	2/15/2013											
12/30/1983	8/27/1991	4/24/1999	12/20/2006	8/17/2014											
6/29/1984	2/25/1992	10/23/1999	6/20/2007	2/15/2015											
9/30/1987	5/28/1995	1/23/2003	9/20/2010	5/18/2018											
12/31/1987	8/28/1995	4/25/2003	12/21/2010												
9/28/1990	5/26/1998	1/21/2006	9/18/2013												
9/30/1998	5/28/2006	1/23/2014													
12/31/1999	8/28/2007	4/25/2015													
9/28/2001	5/26/2009	1/21/2017													
9/30/2002	5/28/2010	1/23/2018													
12/31/2003	8/28/2011														
9/30/2004	5/28/2012														
12/31/2004	8/28/2012														
9/28/2007	5/26/2015														
3/31/2009	11/26/2016														
9/30/2011															
12/31/2014															
9/30/2015															
5/25/2018															

Table 51: Cycles for DJIA Quarters based on a cycle length of 46.6 quarters

	46.611377									
6/28/1901	2/21/1913	10/17/1924	6/12/1936	2/6/1948	10/3/1959	5/29/1971	1/22/1983	9/17/1994	5/13/2006	1/7/2018
9/30/1903	5/26/1915	1/19/1927	9/14/1938	5/10/1950	1/4/1962	8/30/1973	4/25/1985	12/19/1996	8/14/2008	
3/30/1906	11/23/1917	7/19/1929	3/14/1941	11/7/1952	7/4/1964	2/28/1976	10/24/1987	6/19/1999	2/12/2011	
12/31/1907	8/26/1919	4/21/1931	12/15/1942	8/10/1954	4/6/1966	11/30/1977	7/26/1989	3/21/2001	11/14/2012	
9/30/1909	5/26/1921	1/19/1933	9/14/1944	5/10/1956	1/5/1968	8/31/1979	4/26/1991	12/20/2002	8/15/2014	
9/30/1910	5/26/1922	1/19/1934	9/14/1945	5/10/1957	1/4/1969	8/30/1980	4/25/1992	12/20/2003	8/15/2015	
9/29/1911	5/25/1923	1/18/1935	9/13/1946	5/9/1958	1/3/1970	8/29/1981	4/24/1993	12/18/2004	8/13/2016	
9/30/1912	5/26/1924	1/20/1936	9/15/1947	5/11/1959	1/5/1971	8/31/1982	4/26/1994	12/20/2005	8/15/2017	
6/30/1913	2/23/1925	10/19/1936	6/14/1948	2/8/1960	10/5/1971	5/31/1983	1/24/1995	9/19/2006	5/15/2018	
3/31/1914	11/24/1925	7/20/1937	3/15/1949	11/8/1960	7/5/1972	2/29/1984	10/25/1995	6/20/2007		
12/31/1914	8/26/1926	4/21/1938	12/15/1949	8/10/1961	4/6/1973	11/30/1984	7/26/1996	3/21/2008		
6/30/1916	2/24/1928	10/20/1939	6/15/1951	2/8/1963	10/5/1974	5/31/1986	1/24/1998	9/19/2009		
9/29/1916	5/25/1928	1/19/1940	9/14/1951	5/10/1963	1/4/1975	8/30/1986	4/25/1998	12/19/2009		
12/31/1917	8/26/1929	4/21/1941	12/15/1952	8/10/1964	4/6/1976	12/1/1987	7/27/1999	3/22/2011		
9/30/1919	5/26/1931	1/19/1943	9/14/1954	5/10/1966	1/4/1978	8/30/1989	4/25/2001	12/19/2012		
6/30/1921	2/23/1933	10/19/1944	6/14/1956	2/8/1968	10/5/1979	5/31/1991	1/24/2003	9/19/2014		
3/30/1923	11/23/1934	7/19/1946	3/14/1958	11/7/1969	7/4/1981	2/27/1993	10/23/2004	6/18/2016		
9/28/1923	5/24/1935	1/17/1947	9/12/1958	5/8/1970	1/2/1982	8/28/1993	4/23/2005	12/17/2016		
9/30/1929	5/26/1941	1/19/1953	9/14/1964	5/10/1976	1/5/1988	8/31/1999	4/26/2011			
6/30/1932	2/24/1944	10/20/1955	6/15/1967	2/8/1979	10/5/1990	5/31/2002	1/24/2014			
9/28/1934	5/24/1946	1/17/1958	9/12/1969	5/8/1981	1/2/1993	8/28/2004	4/23/2016			
3/31/1937	11/24/1948	7/20/1960	3/15/1972	11/9/1983	7/6/1995	3/1/2007				
3/31/1938	11/24/1949	7/20/1961	3/15/1973	11/8/1984	7/5/1996	2/29/2008				
12/30/1938	8/25/1950	4/20/1962	12/14/1973	8/9/1985	4/5/1997	11/29/2008				
6/30/1939	2/23/1951	10/19/1962	6/14/1974	2/7/1986	10/4/1997	5/30/2009				
6/28/1940	2/22/1952	10/18/1963	6/13/1975	2/6/1987	10/3/1998	5/29/2010				
3/31/1942	11/24/1953	7/20/1965	3/15/1977	11/8/1988	7/5/2000	2/29/2012				
6/30/1943	2/23/1955	10/19/1966	6/14/1978	2/7/1990	10/4/2001	5/30/2013				
12/31/1943	8/26/1955	4/21/1967	12/15/1978	8/10/1990	4/6/2002	11/30/2013				
6/28/1946	2/21/1958	10/17/1969	6/12/1981	2/5/1993	10/2/2004	5/28/2016				
9/30/1946	5/26/1958	1/19/1970	9/14/1981	5/10/1993	1/4/2005	8/30/2016				
3/31/1948	11/25/1959	7/21/1971	3/16/1983	11/9/1994	7/6/2006	3/1/2018				
6/30/1948	2/24/1960	10/20/1971	6/15/1983	2/8/1995	10/5/2006	5/31/2018				
6/30/1949	2/23/1961	10/19/1972	6/14/1984	2/8/1996	10/5/2007					
12/31/1952	8/26/1964	4/21/1976	12/16/1987	8/11/1999	4/7/2011					
9/30/1953	5/26/1965	1/19/1977	9/14/1988	5/10/2000	1/5/2012					
3/30/1956	11/24/1967	7/20/1979	3/15/1991	11/8/2002	7/5/2014					
6/28/1957	2/21/1969	10/17/1980	6/12/1992	2/6/2004	10/3/2015					
12/31/1957	8/26/1969	4/21/1981	12/15/1992	8/10/2004	4/6/2016					
12/31/1959	8/26/1971	4/21/1983	12/15/1994	8/10/2006	4/6/2018					
9/30/1960	5/26/1972	1/20/1984	9/15/1995	5/11/2007						
12/29/1961	8/24/1973	4/19/1985	12/13/1996	8/8/2008						
6/29/1962	2/22/1974	10/18/1985	6/13/1997	2/6/2009						
6/30/1965	2/23/1977	10/19/1988	6/14/2000	2/8/2012						
12/31/1965	8/26/1977	4/21/1989	12/15/2000	8/10/2012						
9/30/1966	5/26/1978	1/19/1990	9/14/2001	5/10/2013						
9/29/1967	5/25/1979	1/18/1991	9/13/2002	5/9/2014						
3/29/1968	11/23/1979	7/19/1991	3/14/2003	11/7/2014						
12/31/1968	8/26/1980	4/21/1992	12/16/2003	8/11/2015						
6/30/1970	2/23/1982	10/19/1993	6/14/2005	2/7/2017						
3/31/1971	11/24/1982	7/20/1994	3/15/2006	11/8/2017						
12/29/1972	8/24/1984	4/19/1996	12/14/2007							
9/30/1974	5/26/1986	1/19/1998	9/14/2009							
12/31/1976	8/26/1988	4/21/2000	12/16/2011							
3/31/1978	11/24/1989	7/20/2001	3/15/2013							
9/29/1978	5/25/1990	1/18/2002	9/13/2013							
9/28/1979	5/24/1991	1/17/2003	9/12/2014							
3/31/1980	11/25/1991	7/21/2003	3/16/2015							
3/31/1981	11/24/1992	7/20/2004	3/15/2016							
6/30/1982	2/23/1994	10/19/2005	6/14/2017							
12/30/1983	8/25/1995	4/20/2007								
6/29/1984	2/23/1996	10/19/2007								
9/30/1987	5/26/1999	1/19/2011								
12/31/1987	8/26/1999	4/21/2011								
9/28/1990	5/24/2002	1/17/2014								
9/30/1998	5/26/2010									
12/31/1999	8/26/2011									
9/28/2001	5/24/2013									
9/30/2002	5/26/2014									
12/31/2003	8/26/2015									
9/30/2004	5/26/2016									
12/31/2004	8/26/2016									
9/28/2007										
3/31/2009										
9/30/2011										
12/31/2014										
9/30/2015										
5/25/2018										

Table 52: Cycles for DJIA Quarters based on a cycle length of 80.5 quarters

	80.496187					
6/28/1901	8/12/1921	9/26/1941	11/10/1961	12/26/1981	2/9/2002
9/30/1903	11/14/1923	12/29/1943	2/12/1964	3/29/1984	5/13/2004
3/30/1906	5/14/1926	6/28/1946	8/12/1966	9/27/1986	11/11/2006
12/31/1907	2/14/1928	3/30/1948	5/14/1968	6/29/1988	8/13/2008
9/30/1909	11/14/1929	12/29/1949	2/12/1970	3/30/1990	5/14/2010
9/30/1910	11/14/1930	12/29/1950	2/12/1971	3/30/1991	5/14/2011
9/29/1911	11/13/1931	12/28/1951	2/11/1972	3/28/1992	5/12/2012
9/30/1912	11/14/1932	12/29/1952	2/12/1973	3/30/1993	5/14/2013
6/30/1913	8/14/1933	9/28/1953	11/12/1973	12/28/1993	2/11/2014
3/31/1914	5/15/1934	6/29/1954	8/13/1974	9/28/1994	11/12/2014
12/31/1914	2/14/1935	3/31/1955	5/15/1975	6/30/1995	8/14/2015
6/30/1916	8/14/1936	9/28/1956	11/12/1976	12/28/1996	2/11/2017
9/29/1916	11/13/1936	12/28/1956	2/11/1977	3/29/1997	5/13/2017
12/31/1917	2/14/1938	3/31/1958	5/15/1978	6/30/1998	
9/30/1919	11/14/1939	12/29/1959	2/12/1980	3/29/2000	
6/30/1921	8/14/1941	9/28/1961	11/12/1981	12/28/2001	
3/30/1923	5/14/1943	6/28/1963	8/12/1983	9/27/2003	
9/28/1923	11/12/1943	12/27/1963	2/10/1984	3/27/2004	
9/30/1929	11/14/1949	12/29/1969	2/12/1990	3/30/2010	
6/30/1932	8/14/1952	9/28/1972	11/12/1992	12/28/2012	
9/28/1934	11/12/1954	12/27/1974	2/10/1995	3/28/2015	
3/31/1937	5/15/1957	6/29/1977	8/13/1997	9/28/2017	
3/31/1938	5/15/1958	6/29/1978	8/13/1998		
12/30/1938	2/13/1959	3/30/1979	5/14/1999		
6/30/1939	8/14/1959	9/28/1979	11/12/1999		
6/28/1940	8/12/1960	9/26/1980	11/10/2000		
3/31/1942	5/15/1962	6/29/1982	8/13/2002		
6/30/1943	8/14/1963	9/28/1983	11/12/2003		
12/31/1943	2/14/1964	3/30/1984	5/14/2004		
6/28/1946	8/12/1966	9/26/1986	11/10/2006		
9/30/1946	11/14/1966	12/29/1986	2/12/2007		
3/31/1948	5/15/1968	6/29/1988	8/13/2008		
6/30/1948	8/14/1968	9/28/1988	11/12/2008		
6/30/1949	8/14/1969	9/28/1989	11/12/2009		
12/31/1952	2/14/1973	3/31/1993	5/15/2013		
9/30/1953	11/14/1973	12/29/1993	2/12/2014		
3/30/1956	5/14/1976	6/28/1996	8/12/2016		
6/28/1957	8/12/1977	9/26/1997	11/10/2017		
12/31/1957	2/14/1978	3/31/1998	5/15/2018		
12/31/1959	2/14/1980	3/30/2000			
9/30/1960	11/14/1980	12/29/2000			
12/29/1961	2/12/1982	3/29/2002			
6/29/1962	8/13/1982	9/27/2002			
6/30/1965	8/14/1985	9/28/2005			
12/31/1965	2/14/1986	3/31/2006			
9/30/1966	11/14/1986	12/29/2006			
9/29/1967	11/13/1987	12/28/2007			
3/29/1968	5/13/1988	6/27/2008			
12/31/1968	2/14/1989	3/31/2009			
6/30/1970	8/14/1990	9/28/2010			
3/31/1971	5/15/1991	6/29/2011			
12/29/1972	2/12/1993	3/29/2013			
9/30/1974	11/14/1994	12/29/2014			
12/31/1976	2/14/1997	3/31/2017			
3/31/1978	5/15/1998	6/29/2018			
9/29/1978	11/13/1998				
9/28/1979	11/12/1999				
3/31/1980	5/15/2000				
3/31/1981	5/15/2001				
6/30/1982	8/14/2002				
12/30/1983	2/13/2004				
6/29/1984	8/13/2004				
9/30/1987	11/14/2007				
12/31/1987	2/14/2008				
9/28/1990	11/12/2010				
9/30/1998					
12/31/1999					
9/28/2001					
9/30/2002					
12/31/2003					
9/30/2004					
12/31/2004					
9/28/2007					
3/31/2009					
9/30/2011					
12/31/2014					
9/30/2015					
5/25/2018					

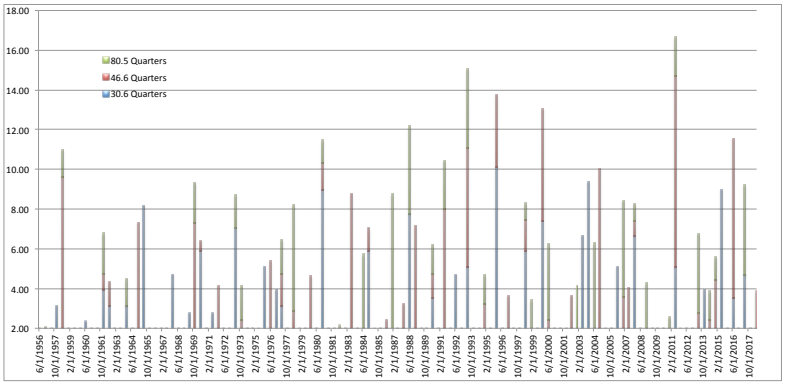

Figure 102: Frequency chart of weighted quarterly cycles counts for the DJIA

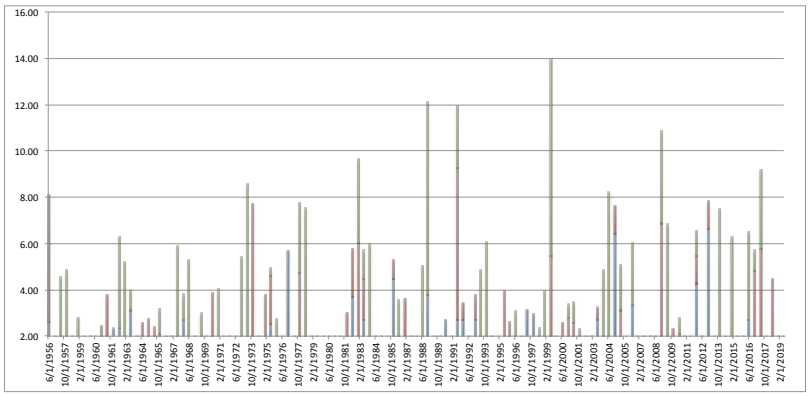

Figure 103: Frequency chart of weighted monthly cycles counts for the DJIA

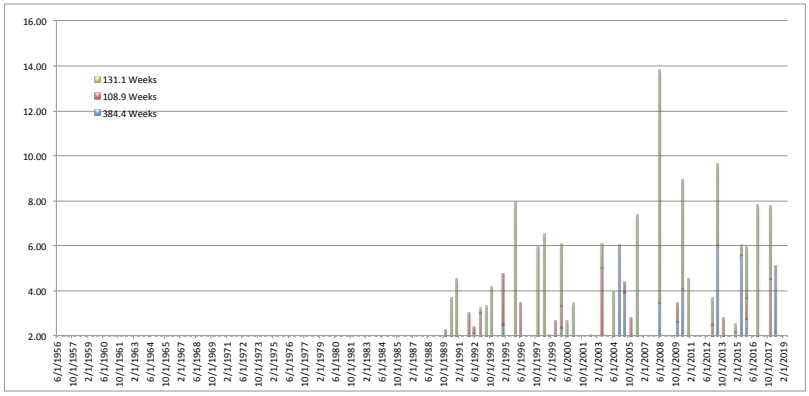

Figure 104: Frequency chart of weighted weekly cycles counts for the DJIA

Table 53: Cycles for S&P 500 Quarters based on a cycle length of 124.6 quarters

CYCLE	*124.58941*	
12/31/1952	2/23/1984	4/18/2015
9/30/1953	11/22/1984	1/16/2016
6/30/1956	8/23/1987	
6/30/1957	8/22/1988	
9/30/1957	11/22/1988	
6/30/1959	8/22/1990	
9/30/1960	11/23/1991	
12/31/1961	2/22/1993	
9/30/1962	11/22/1993	
12/31/1965	2/22/1997	
9/30/1966	11/22/1997	
12/31/1967	2/22/1999	
3/31/1969	5/23/2000	
6/30/1970	8/22/2001	
3/31/1971	5/23/2002	
9/30/1971	11/22/2002	
12/31/1972	2/23/2004	
9/30/1974	11/22/2005	
6/30/1976	8/23/2007	
12/31/1977	2/22/2009	
3/31/1981	5/23/2012	
6/30/1982	8/22/2013	
3/31/1983	5/23/2014	
6/30/1984	8/23/2015	
6/30/1987		
9/30/1987		
6/30/1989		
9/30/1990		
12/31/1993		
3/31/2000		
12/31/2002		
12/31/2003		
9/30/2007		
12/31/2008		
3/31/2011		
9/30/2011		
6/30/2015		
12/31/2015		
12/31/2017		

Table 54: Cycles for S&P 500 Quarters based on a cycle length of 26.7 quarters

CYCLE	*26.7273338*									
12/31/1952	9/6/1959	5/13/1966	1/16/1973	9/23/1979	5/29/1986	2/2/1993	10/9/1999	6/15/2006	2/18/2013	
9/30/1953	6/5/1960	2/10/1967	10/16/1973	6/22/1980	2/26/1987	11/2/1993	7/8/2000	3/15/2007	11/18/2013	
6/30/1956	3/6/1963	11/10/1969	7/16/1976	3/23/1983	11/26/1989	8/2/1996	4/8/2003	12/13/2009	8/18/2016	
6/30/1957	3/5/1964	11/10/1970	7/16/1977	3/22/1984	11/26/1990	8/2/1997	4/7/2004	12/13/2010	8/18/2017	
9/30/1957	6/5/1964	2/10/1971	10/16/1977	6/22/1984	2/26/1991	11/2/1997	7/8/2004	3/15/2011	11/18/2017	
6/30/1959	3/5/1966	11/9/1972	7/16/1979	3/22/1986	11/25/1992	8/2/1999	4/7/2006	12/12/2012		
9/30/1960	6/6/1967	2/10/1974	10/16/1980	6/23/1987	2/26/1994	11/2/2000	7/9/2007	3/15/2014		
12/31/1961	9/5/1968	5/13/1975	1/16/1982	9/22/1988	5/29/1995	2/2/2002	10/8/2008	6/15/2015		
9/30/1962	6/5/1969	2/10/1976	10/16/1982	6/22/1989	2/26/1996	11/2/2002	7/8/2009	3/14/2016		
12/31/1965	9/5/1972	5/13/1979	1/16/1986	9/22/1992	5/29/1999	2/2/2006	10/8/2012			
9/30/1966	6/5/1973	2/10/1980	10/16/1986	6/22/1993	2/26/2000	11/2/2006	7/8/2013			
12/31/1967	9/5/1974	5/12/1981	1/16/1988	9/22/1994	5/28/2001	2/2/2008	10/8/2014			
3/31/1969	12/5/1975	8/11/1982	4/16/1989	12/22/1995	8/27/2002	5/3/2009	1/7/2016			
6/30/1970	3/5/1977	11/10/1983	7/16/1990	3/22/1997	11/26/2003	8/2/2010	4/7/2017			
3/31/1971	12/4/1977	8/10/1984	4/16/1991	12/21/1997	8/26/2004	5/3/2011	1/6/2018			
9/30/1971	6/5/1978	2/9/1985	10/16/1991	6/22/1998	2/25/2005	11/2/2011	7/8/2018			
12/31/1972	9/6/1979	5/13/1986	1/16/1993	9/23/1999	5/29/2006	2/2/2013				
9/30/1974	6/5/1981	2/10/1988	10/16/1994	6/22/2001	2/26/2008	11/2/2014				
6/30/1976	3/6/1983	11/10/1989	7/16/1996	3/23/2003	11/26/2009	8/2/2016				
12/31/1977	9/5/1984	5/13/1991	1/16/1998	9/22/2004	5/29/2011	2/2/2018				
3/31/1981	12/5/1987	8/11/1994	4/16/2001	12/22/2007	8/27/2014					
6/30/1982	3/5/1989	11/10/1995	7/16/2002	3/22/2009	11/26/2015					
3/31/1983	12/4/1989	8/10/1996	4/16/2003	12/21/2009	8/26/2016					
6/30/1984	3/6/1991	11/10/1997	7/16/2004	3/23/2011	11/26/2017					
6/30/1987	3/5/1994	11/9/2000	7/16/2007	3/22/2014						
9/30/1987	6/5/1994	2/9/2001	10/16/2007	6/22/2014						
6/30/1989	3/5/1996	11/10/2002	7/16/2009	3/22/2016						
9/30/1990	6/5/1997	2/10/2004	10/16/2010	6/22/2017						
12/31/1993	9/5/2000	5/13/2007	1/16/2014							
3/31/2000	12/5/2006	8/11/2013								
12/31/2002	9/5/2009	5/12/2016								
12/31/2003	9/5/2010	5/12/2017								
9/30/2007	6/5/2014									
12/31/2008	9/6/2015									
3/31/2011	12/4/2017									
9/30/2011	6/5/2018									
6/30/2015										
12/31/2015										
12/31/2017										

Table 55: Cycles for S&P 500 Quarters based on a cycle length of 15.8 quarters

CYCLE	*15.803656*															
12/31/1952	12/13/1956	11/25/1960	11/7/1964	10/20/1968	10/2/1972	9/14/1976	8/27/1980	8/9/1984	7/22/1988	7/4/1992	6/16/1996	5/29/2000	5/11/2004	4/23/2008	4/6/2012	3/19/2016
9/30/1953	9/12/1957	8/25/1961	8/7/1965	7/20/1969	7/2/1973	6/14/1977	5/27/1981	5/9/1985	4/21/1989	4/3/1993	3/16/1997	2/26/2001	2/8/2005	1/21/2009	1/4/2013	12/17/2016
6/30/1956	6/12/1960	5/25/1964	5/7/1968	4/19/1972	4/1/1976	3/14/1980	2/25/1984	2/7/1988	1/20/1992	1/2/1996	12/15/1999	11/27/2003	11/9/2007	10/22/2011	10/5/2015	
6/30/1957	6/12/1961	5/25/1965	5/7/1969	4/19/1973	4/1/1977	3/14/1981	2/24/1985	2/6/1989	1/19/1993	1/1/1997	12/14/2000	11/26/2004	11/8/2008	10/21/2012	10/4/2016	
9/30/1957	9/12/1961	8/25/1965	8/7/1969	7/20/1973	7/2/1977	6/14/1981	5/27/1985	5/9/1989	4/21/1993	4/3/1997	3/16/2001	2/26/2005	2/8/2009	1/21/2013	1/4/2017	
6/30/1959	6/12/1963	5/25/1967	5/7/1971	4/19/1975	4/1/1979	3/14/1983	2/24/1987	2/6/1991	1/19/1995	1/1/1999	12/14/2002	11/26/2006	11/8/2010	10/21/2014		
9/30/1960	9/12/1964	8/25/1968	8/7/1972	7/20/1976	7/2/1980	6/14/1984	5/27/1988	5/9/1992	4/21/1996	4/3/2000	3/16/2004	2/27/2008	2/9/2012	1/22/2016		
12/31/1961	12/13/1965	11/25/1969	11/7/1973	10/20/1977	10/2/1981	9/14/1985	8/27/1989	8/9/1993	7/22/1997	7/4/2001	6/16/2005	5/29/2009	5/11/2013	4/23/2017		
9/30/1962	9/12/1966	8/25/1970	8/7/1974	7/20/1978	7/2/1982	6/14/1986	5/27/1990	5/9/1994	4/21/1998	4/3/2002	3/16/2006	2/26/2010	2/8/2014	1/21/2018		
12/31/1965	12/13/1969	11/25/1973	11/7/1977	10/20/1981	10/2/1985	9/14/1989	8/27/1993	8/9/1997	7/22/2001	7/4/2005	6/16/2009	5/29/2013	5/11/2017			
9/30/1966	9/12/1970	8/25/1974	8/7/1978	7/20/1982	7/2/1986	6/14/1990	5/27/1994	5/9/1998	4/21/2002	4/3/2006	3/16/2010	2/26/2014	2/8/2018			
12/31/1967	12/13/1971	11/25/1975	11/7/1979	10/20/1983	10/2/1987	9/14/1991	8/27/1995	8/9/1999	7/22/2003	7/4/2007	6/16/2011	5/29/2015				
3/31/1969	3/13/1973	2/23/1977	2/5/1981	1/18/1985	12/31/1988	12/13/1992	11/25/1996	11/7/2000	10/20/2004	10/2/2008	9/14/2012	8/27/2016				
6/30/1970	6/12/1974	5/25/1978	5/7/1982	4/19/1986	4/1/1990	3/14/1994	2/24/1998	2/6/2002	1/19/2006	1/1/2010	12/14/2013	11/26/2017				
3/31/1971	3/13/1975	2/23/1979	2/5/1983	1/18/1987	12/31/1990	12/13/1994	11/25/1998	11/7/2002	10/20/2006	10/2/2010	9/14/2014					
9/30/1971	9/12/1975	8/25/1979	8/7/1983	7/20/1987	7/2/1991	6/14/1995	5/27/1999	5/9/2003	4/21/2007	4/3/2011	3/16/2015					
12/31/1972	12/13/1976	11/25/1980	11/7/1984	10/20/1988	10/2/1992	9/14/1996	8/27/2000	8/9/2004	7/22/2008	7/4/2012	6/16/2016					
9/30/1974	9/12/1978	8/25/1982	8/7/1986	7/20/1990	7/2/1994	6/14/1998	5/27/2002	5/9/2006	4/21/2010	4/3/2014	3/16/2018					
6/30/1976	6/12/1980	5/25/1984	5/7/1988	4/19/1992	4/1/1996	3/14/2000	2/25/2004	2/7/2008	1/20/2012	1/2/2016						
12/31/1977	12/13/1981	11/25/1985	11/7/1989	10/20/1993	10/2/1997	9/14/2001	8/27/2005	8/9/2009	7/22/2013	7/4/2017						
3/31/1981	3/13/1985	2/23/1989	2/5/1993	1/18/1997	12/31/2000	12/13/2004	11/25/2008	11/7/2012	10/20/2016							
6/30/1982	6/12/1986	5/25/1990	5/7/1994	4/19/1998	4/1/2002	3/14/2006	2/24/2010	2/6/2014	1/19/2018							
3/31/1983	3/13/1987	2/23/1991	2/5/1995	1/18/1999	12/31/2002	12/13/2006	11/25/2010	11/7/2014								
6/30/1984	6/12/1988	5/25/1992	5/7/1996	4/19/2000	4/1/2004	3/14/2008	2/25/2012	2/7/2016								
6/30/1987	6/12/1991	5/25/1995	5/7/1999	4/19/2003	4/1/2007	3/14/2011	2/24/2015									
9/30/1987	9/12/1991	8/25/1995	8/7/1999	7/20/2003	7/2/2007	6/14/2011	5/27/2015									
6/30/1989	6/12/1993	5/25/1997	5/7/2001	4/19/2005	4/1/2009	3/14/2013	2/24/2017									
9/30/1990	9/12/1994	8/25/1998	8/7/2002	7/20/2006	7/2/2010	6/14/2014	5/27/2018									
12/31/1993	12/13/1997	11/25/2001	11/7/2005	10/20/2009	10/2/2013	9/14/2017										
3/31/2000	3/13/2004	2/24/2008	2/6/2012	1/19/2016												
12/31/2002	12/13/2006	11/25/2010	11/7/2014													
12/31/2003	12/13/2007	11/25/2011	11/7/2015													
9/30/2007	9/12/2011	8/25/2015														
12/31/2008	12/13/2012	11/25/2016														
3/31/2011	3/13/2015															
9/30/2011	9/12/2015															
6/30/2015																
12/31/2015																
12/31/2017																

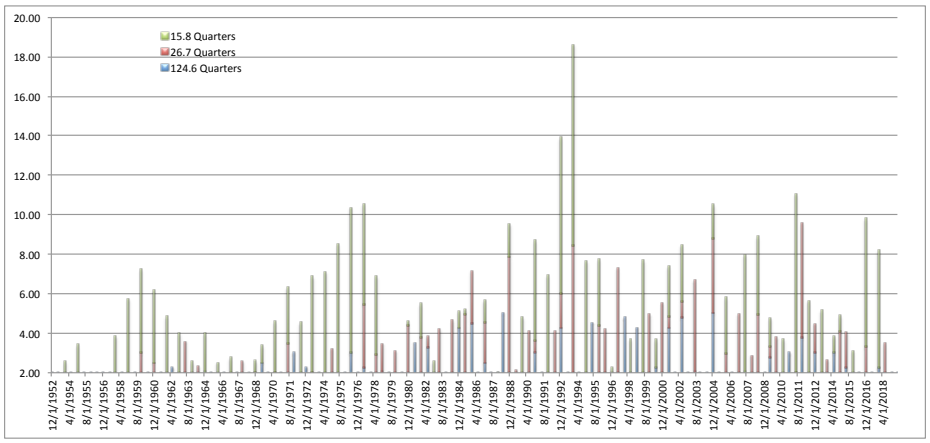

Figure 105: Frequency chart of weighted quarterly cycles counts for the S&P 500

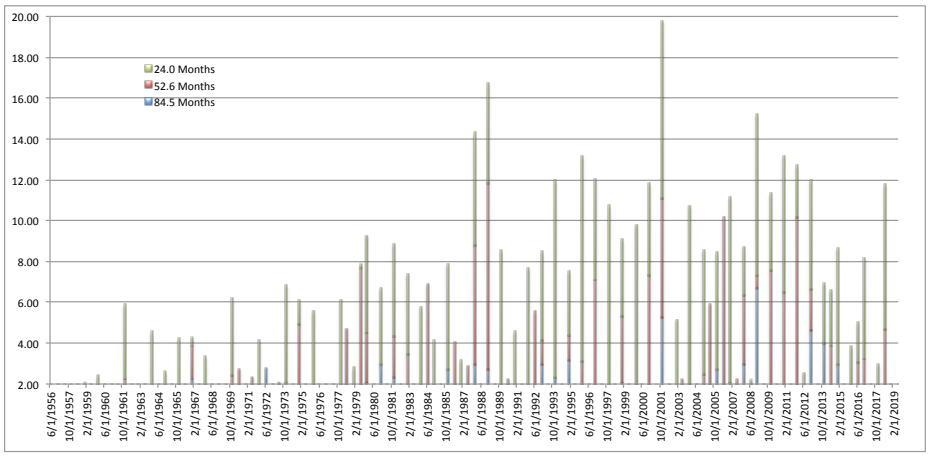

Figure 106: Frequency chart of weighted monthly cycles counts for the S&P 500

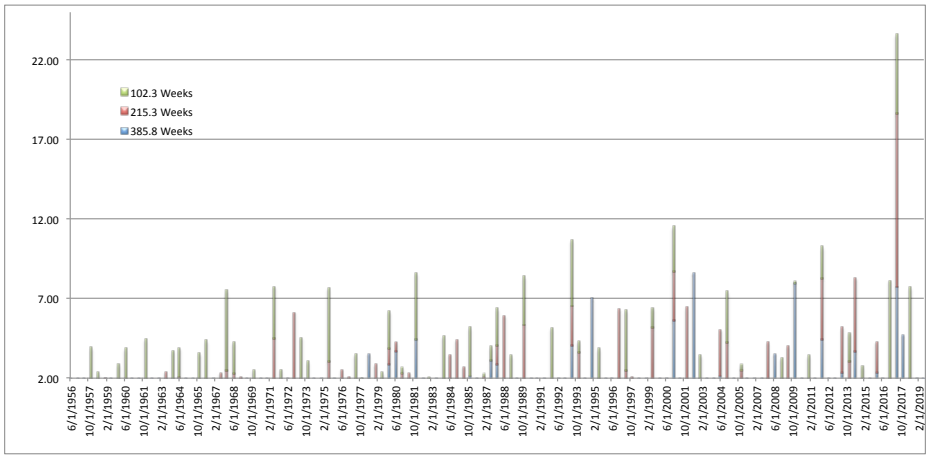

Figure 107: Frequency chart of weighted weekly cycles counts for the S&P 500

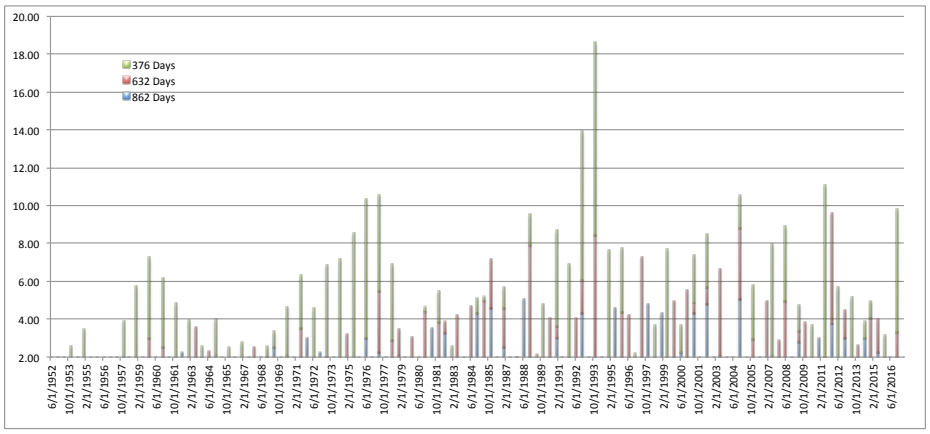

Figure 108: Frequency chart of weighted daily cycles counts for the S&P 500

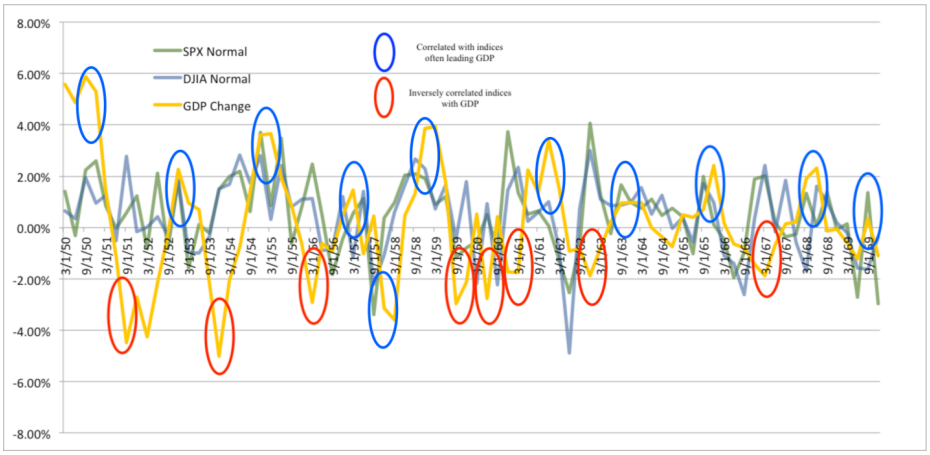

Figure 109: Review of the relationship between S&P 500 and DJIA with changes to quarterly GDP 1950-1969

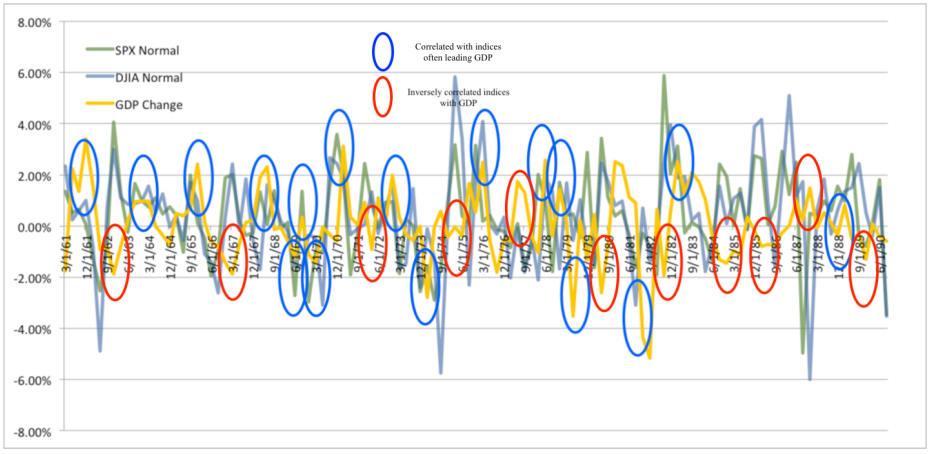

Figure 110: Review of the relationship between S&P 500 and DJIA with changes to quarterly GDP 1961-1990

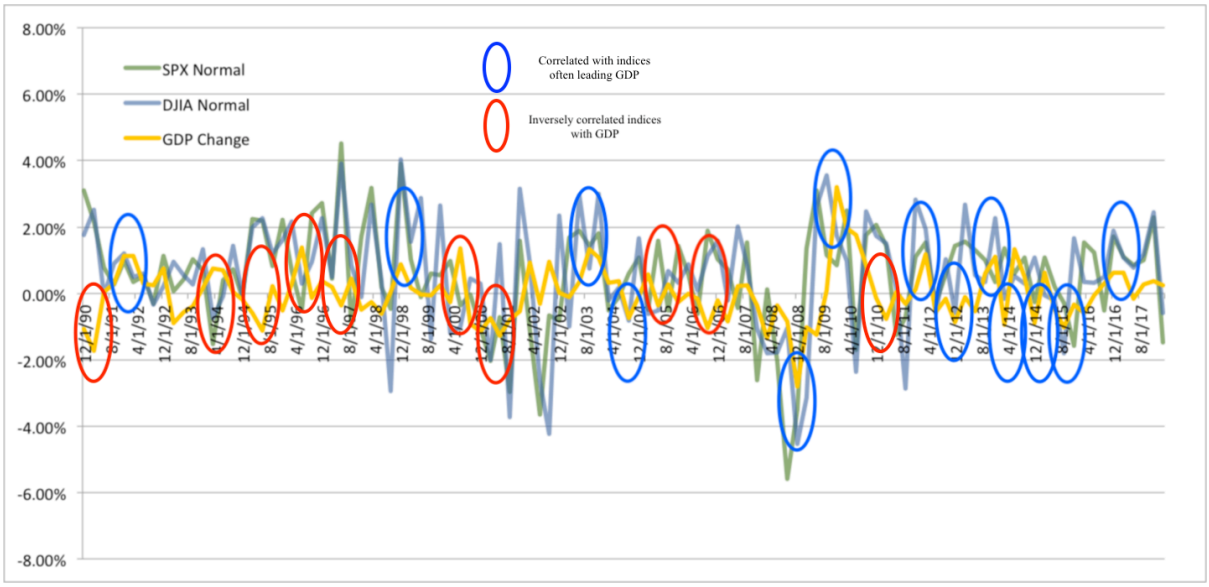

Figure 111: Review of the relationship between S&P 500 and DJIA with changes to quarterly GDP 1990-2017

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