

# Seasonality



The seasons are a big influential factor in the commodities and financial markets. They influence the probability of price movement, whilst working in the background often unobserved. This article will demonstrate different ways traders can utilise seasonal patterns and to what they should pay particular attention.

## What is seasonality?

Seasonality is a seasonal fluctuation or cycle forming a progression or trend. The best-known seasonal progression is the outdoor temperature. The prices of goods are subject to seasonal tendencies as a result of natural processes i.e., harvest or cold weather periods occurring at various times of the year. For example, oil is less expensive in summer than in winter during the heating season. Financial markets also have seasonal patterns as various calendrical occurrences come into play. These include familiar events like dividend payments on

certain dates or on lesser-known phenomena like mood improvement prior to holidays. In a greater sense, seasonality also includes time spans other than those based on the calendar year, i.e., intraday seasonality. In addition, volatility also shows traceable seasonal patterns.

Seasonality is popular in the heating oil market. Many homeowners and building managers cover their fuel needs before the heating season begins leading to early price increases. This demonstrates how important it is to conduct empirical studies and evaluations on seasonal trends and not be swayed by preconceived ideas about them.

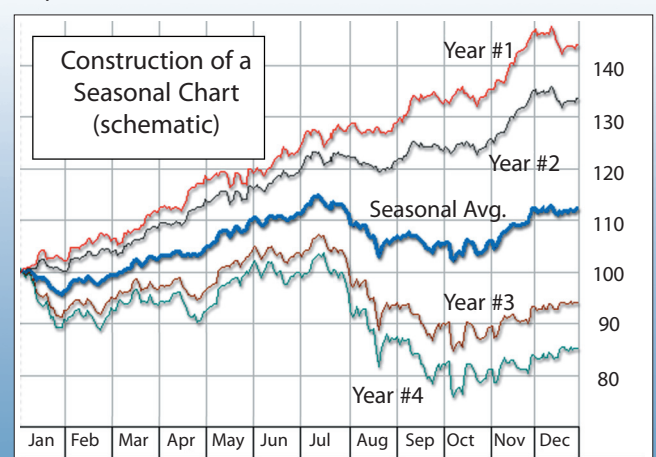
F1) Seasonal Trend in Heating Oil Price



Heating oil prices were least expensive in June and July. Increased purchases caused prices to rise until they reached their peak during the heating season from October through January.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

F2) Construction of a Seasonal Chart



Seasonal Charts do not show prices over a certain time period, but instead show price progression averaged over the course of a certain time frame.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

### F3) Seasonal Course of the Dow Jones



Prices increase on average through the beginning of June before pausing or decreasing. Rising prices generally return again in October.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

### Seasonal Charts

Seasonal trends are best displayed on seasonal charts. Seasonal charts differ to conventional charts in that they do not show prices over a certain time period, but instead show price progression averaged over the course of a certain time frame. If the mean price of all previously sampled time-periods increases during i.e., a certain time of year, it shows on the seasonal chart as a rising trend in those months. The horizontal axis is the time scale (often one year), the vertical axis displays price information frequently as a percentage relationship.

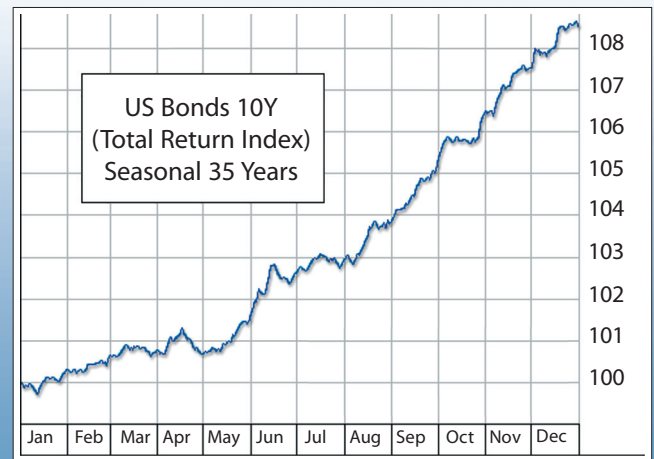
Properly constructed seasonal charts show the exact daily price progression and filter out calendrical irregularities like holidays. The annualised percentage return of a seasonal trading strategy can be easily calculated right from the chart. A well-versed practitioner can create a basic seasonal chart using a spreadsheet for a rough assessment of a seasonal tendency.

### The Yearly Course of the Dow Jones

Figure 3 shows the seasonal course of the Dow Jones over a 34-year period. A regular seasonal upwards-trend can be seen starting in late October and continuing through the beginning of June. The index shows an average price decrease for the remaining period from June until the end of October.

During the sampled time period (October 1970 through October 2004) an investor could have captured 14107 Dow points if he was invested only during the seasonally positive phases between October 27, and June 6. 29 of the 34 tested years would have been profitable during this period. An investment during the seasonally negative period from June 6, through October 27, would have produced a loss of 4860 points. That's an average profit of 11.1% during the good phases compared with a loss of 2.8% during the seasonally bad cycles, which resulted despite the long bull market during these years. By investing only in seasonally favourable times, investment capital is available for alternative investments during negative phases. A buy and hold strategy over the 34 year period yielded a return of 7.9%.

### F4) Bond's Seasonal Course



As opposed to the stock market, bonds become attractive in May.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

### The Seasonal Tendencies of US Bonds

The Bond market offers a place to park money when stocks are seasonally negative, as bonds often show seasonal trends opposite the equity markets. The reason is probably the alternating seasonal relationship of the stock and bond markets (capital redeployment, alternating attractiveness of bonds and stocks, etc.). Figure 4 shows the seasonal course of a bond investment. The swings here appear small because of constantly flowing interest income. Nevertheless, the relative weakness in the first part of the year is easily recognisable followed by strength in the remaining months. One could say for bonds, "Buy in May".

### "Sell in May and Go Away"

This leads us back to the stock market. The seasonal chart of the Dow Jones gives us the opportunity to test one of the stock market's oldest

### F5) Long-term seasonal course of the Dow Jones



This shows the seasonal course of the Dow Jones Industrial Average over the entire available time span from 1896 through the present.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

## F6) Year-End Rally, Performance S&amp;P

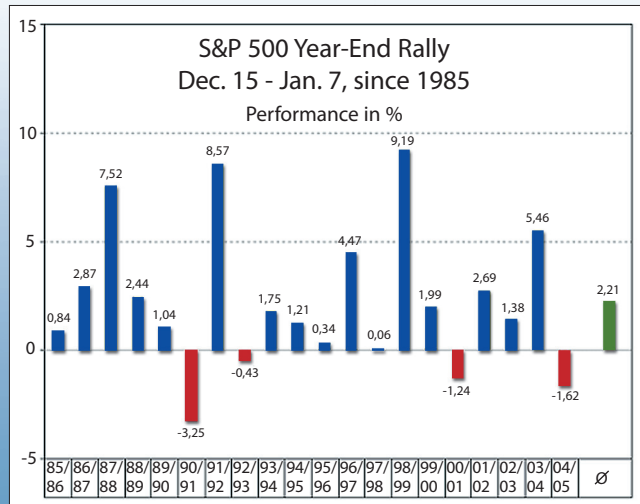


Figure 6 shows the results of each of the last 20 year-end rallies.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

adages, "Sell in May and go away". The saying, originally coined in Great Britain, isn't precise enough for today's markets. An examination of the US indices would actually indicate selling somewhat later. Nevertheless, it is astounding that seasonal weakness still occurs after May. The adage serves to remind us, however that seasonal progressions can change and should always be examined for consistency and stability.

### Long-term Seasonality

A strong indication of a stable seasonal cycle is its observance over a long period of time. This reduces the chance of circumstantial price changes skewing the yearly seasonal chart. The long-term view also indicates that basic fundamentals are likely behind the yearly cycle. Figure 5 again shows the yearly course of the Dow Jones, this time over the entire available time span from 1896 through the present.

The weakness in September is clearly observable over the long-term. The same goes for the strength in the first part of the year. Especially interesting is the strength from the middle of December through the beginning of January, the year-end- or Santa Claus-rally. The chart clearly shows its proportionally steep angle.

### What is a Seasonal Pattern?

An entire seasonal cycle cannot be traded, but a single seasonal pattern can. A seasonal pattern is an identifiable seasonal movement between two dates. A high occurrence probability, timeliness, and a solid fundamental reason for the movement are desirable. Seasonal patterns can be short-, medium-, or long-term in nature and can overlap as well. In addition, statistical conclusions can really only be drawn in connection with single seasonal patterns.

### Example Year-End Rally

A succinct seasonal pattern in the US stock market is the year-end rally. It begins on December 12, and ends on January 7, the following year. In the S&P 500, the definitive index for futures, there was a price

## F7) Euro / US Dollar



This chart shows the Seasonal Course of the Euro/US Dollar

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

increase between these two dates in 16 of the last 20 years. The average gain was 3.2%. Losses occurred only four times and averaged just 1.6%. In total the S&P rose on average during the 20-year period 2.2% just during these 15 trading days. Figure 6 shows the results of each of the last 20 year-end rallies.

### The US Dollar

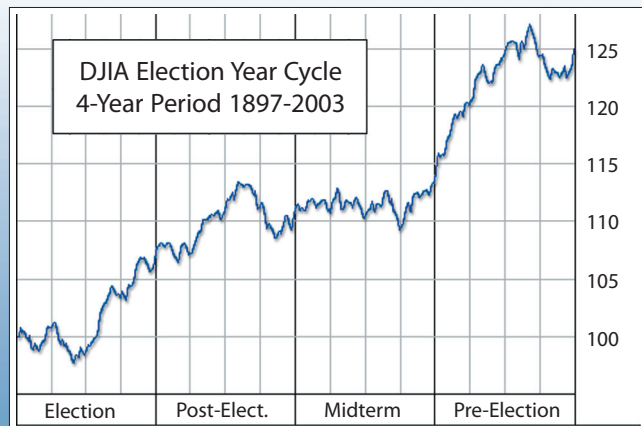
Another lesser-known year-end seasonal pattern can be found in the US Dollar. The Chart in Figure 7 shows the seasonal course of the Euro/Dollar Forex rate over the last 33 years including the year 2004. Clearly the Euro rises seasonally through the end of December before reversing course around the new-year and falling through the end of January. Money flows out of the Dollar as the year changes only to turn and flow back. The reason is thought to be the year-end deadline for financial statements.

Recently, the Euro stayed solid through December 2004, as the mood for the Dollar remained bearish. Few market observers could imagine a stronger Dollar considering the high Balance of Payments deficit and the US currency's established down trend. Nevertheless a trend change took place just as the new-year began, surprising many, except those using seasonal trend analysis. They had anticipated the trend reversal at exactly this point.

### Other Period Lengths

Seasonal progressions are also measured in time frames other than one year (also known as cycles). Intraday-seasonality is a short-term occurrence worth mentioning. The S&P 500 has intraday patterns moving as much as one-tenth of a percent. That's not only interesting for day traders, but also for position traders trying to improve entry and exit points. Weekly and monthly perspectives are also worth a look. It was noted decades ago that years ending in "5" (i.e., 1905), are usually solid market years in the ten-year cycle, the reasons, however remain unknown. The cause of the four-year- or election cycle is more obvious. US Presidents want to be re-elected or favour a candidate from their own party to take their place. They, as well as the Federal Reserve, try and ensure the economy runs smoothly before the

## F8) Four-Year Election Cycle, Dow Jones



The course of the Dow Jones according to the year within the election cycle over a span of about 100 years.

Source: [www.seasonalcharts.com](http://www.seasonalcharts.com)

election. Unpopular measures are usually held until after the voting.

### The Four-Year Election Cycle in the US Stock Market

The course of the stock market is hardly dependent on whether a Republican or a Democrat becomes President. There were stable stock markets under Clinton (Democrat) as well as Reagan (Republican). For that reason, figure 8 does not indicate political parties, and instead shows the course of the Dow Jones according to the year within the election cycle over a span of about 100 years. Above "Election" is the average Dow Jones course of all election years, above "Post-Elect" all post election years, and so on. The average total performance over the four-year cycle is 25% (see right scale).

Over the last 100 years, the Dow Jones increased an average of 7.5% during election years. Pre-election years were even better with an average increase of 9.3%. Post-election and midterm years (3.5% and 2.8%) were modest, but on the whole positive. These results largely confirm election cycle tactics used by the political parties.

### Other Markets Influenced by the Four-Year Cycle

Next to the US stock market, the four-year election cycle also influences the currency and bond markets. Bond markets typically tend to be weak the year before an election, which is opposite the stock market, strengthening the assumption the two markets are cyclically connected through investment preferences and capital redeployment. The stock markets of various countries also have a four-year cycle resulting from the dominance of American markets and their international influence. The same goes for countries that have their own election cycle running counter to the four-year cycle.

### Using Seasonality in a Trading Strategy

Seasonality is based on both fundamental and technical elements. Fundamental factors determine seasonal price changes, whilst seasonal trends are calculated from historical prices the same way indicators are. That's why seasonality is classified as both fundamental, as well as technical analysis.

Characteristically, the calendar is the determining factor in seasonality and is not dependent on other factors in technical- or fundamental analysis. Technical and fundamental approaches often mirror themselves and create little added value. That isn't a concern when using seasonality because it behaves more like a non-correlating signal generator. The following paragraphs describe several concrete ways to trade using seasonality.

### Combining Factors

Seasonal patterns are one of several factors influencing the course of prices together with general price trend, sentiment, exchange rates etc., so it makes sense to use seasonality in a broadly structured forecasting model as one of several decision criteria. This approach is possible with discretionary as well as systematic trading methods. All seasonal factors flow into the calculation as a weighted input and are then combined into a total end result. When an investment decision is based on interest rates, crude oil price trends, the currency situation and the trend of the stock market, then seasonality can be used as decision criteria as well. The weighting depends on the market, the seasonal pattern and the importance of any remaining factors. The share of seasonality in the decision making process could amount to 10% or 20%. More may be appropriate if the seasonal pattern is strong.

### Filtering and Leverage

One simple application is to use seasonality as a filter. That means abstaining from positions that are against the seasonal trend. An example would be for a day trader not to go short during the year-end rally. The profit probability of long trades could also be increased in this way. Another example is the previously mentioned "Sell in May" strategy. Next to avoiding positions altogether it would also be possible to adjust position size according to seasonal trends. For instance reducing the amount of securities in an investment mix during seasonally negative phases or lowering the number of contracts when trading futures. This allows for a smoother equity curve through loss reduction, as well as more positive total results.

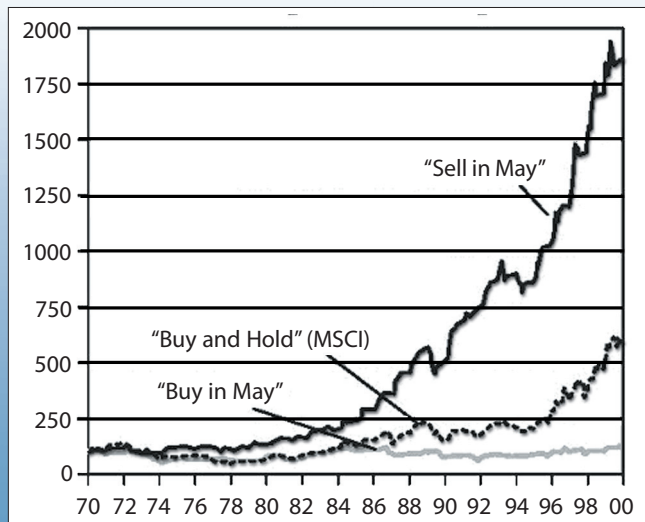
### Market Timing

Seasonality is even appropriate for simple timing strategies. Seasonal factors do not determine actual signals, but the time of execution instead. One example would be redeploying capital in a portfolio in two phases by selling positions in June as summertime weakness sets in, and buying at the end of October when the year-end rally begins. Or for that matter, waiting for the year-end rally before engaging in any new positions.

### Pattern Trading

It might seem that trading specific seasonal patterns like the year-end-rally would be the most logical approach. In practice however this can be rather challenging. It requires the knowledge of a large number of various patterns in order to begin to differentiate between them. Losses must be avoided when false signals occur and position size should be kept small, as individual years experience much higher swings than the seasonal average. There are also a number of statistical snares. Would-be seasonal patterns, random in nature and void of

## F9) "Sell in May" Strategy Performance



Sources: NZJ Jan. 4, 2001 p. 24; Partner Bank; Hans-Peter Huber

forecasting value, must be integrated into any trading system tending to make over-optimising more likely. Dealing with these points professionally requires a great deal of effort and errors can easily creep into evaluations, making the trading of these patterns often unpractical.

### Runaway Years

An instrument is best utilised when its limits are understood. One of the most important aspects of seasonality is that certain years can develop completely contrary to the seasonal index, which is another reason for a good stop loss strategy. Even the otherwise stable year-end-rally produced some unexpected negative results as shown in figure 6. Runaway years are important when evaluating historical data especially if a drastic move such as a crash has occurred. Moves such as these skew the course of the seasonal trend. To reduce this influence it's important to use a high number of years (i.e., 30) when calculating seasonal progressions.

### Timeliness and Stability

Seasonal trends can change, making it important to test the validity of a seasonal pattern. This is illustrated in agricultural commodities when new storage technologies are introduced. That's why it's necessary to check the relative recent past for a pattern's occurrence. Additionally the pattern should appear in a large number of past years, increasing the probability that the move is actually seasonal in nature.

### Is it seasonality?

One important question is whether the pattern being observed is seasonal at all. Many progressions appearing to be seasonal can be the result of purely random historical price movement with no forecasting value. Concrete knowledge of the reasons behind a seasonal move is desirable, but often the cause is unknown (not to imply it doesn't exist.) Some traders of course trade every pattern whether proven or not, expecting authentic ones to produce positive results, whilst the

profits and losses of fake patterns cancel each other out.

### Additional Practical Aspects

There are seasonal strategies for various time horizons whether day trader or long-term investor. As the examples above show, seasonality can also be utilised when the actual trading time span is different than the time span of the seasonal pattern. One of the main advantages of seasonality is that it can be applied across different markets eliminating the need to rework the method for each new market. In fact the financial markets, contrary to popular opinion, are well suited to seasonal trading. It should be noted, however, that in the commodity markets, it's only futures that can be traded in this way, not the underlying cash market. Many seasonal patterns in commodities futures are already priced into the various delivery months, making them more difficult to trade. Also note that when trading futures, the seasonal charts of the futures contracts should be used.

### Conclusion

Seasonality increases the chance of a price move and is one of the few truly testable trading methods. Trading seasonal trends offers advantages because the calendrical influence that it's based on is independent of other influential factors - a long-term advantage for the investor.

The old market adage "Sell in May" makes this clear. Figure 9 compares stock investments based on the MSCI world index. The top solid line shows performance during the seasonally favourable phase from the end of November through the end of May. The Buy and Hold strategy is represented by the MSCI index, and "Buy in May", is a strategy opposite the top line. Bonds were used as an investment during the off periods.

The authors Bouman and Jacobsen in their study of the "Sell in May" strategy ([www.ssrn.com/abstract=76248](http://www.ssrn.com/abstract=76248)) confirmed the effectiveness of this seasonal approach. They examine a number of international markets, some over a very long time. Considering how old and how well known these wise words are, and the fact that the strategy hasn't been optimised with technology, its out-performance is impressive. There is hardly a comparable investment method - technical or fundamental.

## Dimitri Speck

Dimitri Speck specialises in pattern recognition and trading systems development. He publishes the website [www.SeasonalCharts.com](http://www.SeasonalCharts.com), which features free-of-charge seasonal charts for interested investors. Other subjects covered include market aberrations, gold and commodities.

