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UNIVERSIDAD PONTIFICIA
ICAI

GRADO EN INGENIERÍA EN TECNOLOGÍAS INDUSTRIALES

TRABAJO FIN DE GRADO

VISUAL TRADING BASED ON TECHNICAL INDICATORS

Autor: Fernando Romero López

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Madrid

Julio de 2019

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Abstract.

In this project about visual trading based on technical indicators are analyzed two of the most important technical indicators in the last decades, the RSI and the MACD. Both indicators will be analyzed and explained deeply to get a strong idea about them, how they are calculated and the wide range of possibilities that they offer, regarding investment strategies.

Firstly, it is explained the aimed of this project, the targets that have been tried to achieve, the methodology followed and the resources that have been used. The first chapter will help the lecturer to a complete understand about what it would be read and explained in the following chapter, serving as a guide to the reader.

The main targets followed have been the study and development of investment strategies that just basing on the RSI or on the MACD will achieve great performances. These strategies are going to be very basic, so if they result to be satisfactory, it would open the chance of make profitable investment with a very few dedication to follow the portfolio, just a simple looking of these indicators would be enough to know if there is required to open an operation, to close it or just to follow if it is already opened.

To check the strategies and implement them on real stocks, it has been selected different strategies, operating in the Spanish and American markets and most of them following different trends. These stocks have been classified in four groups with the strategies based on the RSI and in two groups with strategies based on the MACD. These groups are uptrend, downtrend, lateral movement uptrend and lateral movement downtrend and the stocks that belong to each of the groups are:

- Uptrend: United Health Group, Merck and Co. and Abbot Laboratories.
- Downtrend: General Electric and Kraft Heinz Company.
- Lateral movement uptrend: Facebook, Visa, Mastercard and AbbVie.
- Lateral movement downtrend: Enagas and Zardoya.

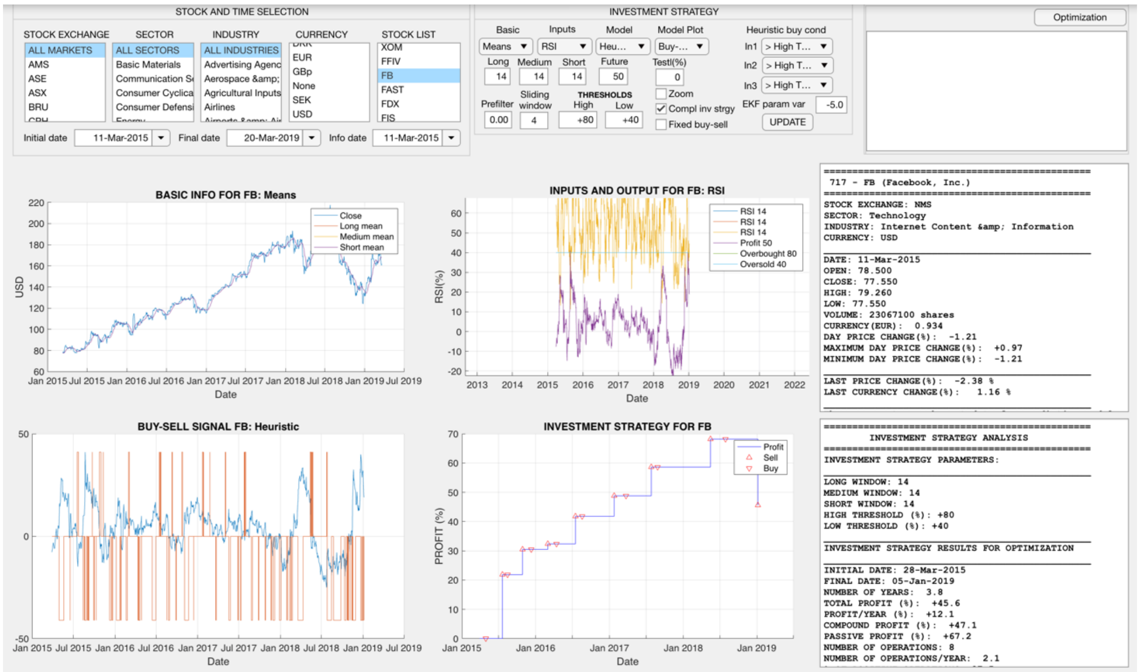
Then, it is explained both technical indicators, beginning with an introduction to technical analysis that collect the evolution of it since it began some centuries ago until the technical analysis, which is worldwide know because of his apply with stock´s markets.

After, this introduction and having a better understanding about what is it and which are the main assumptions and rules that governs this way of making investment strategies, the RSI will be explained firstly. The history about the RSI and how it is calculated compose the most important part

to a correct understand of the different strategies that will be used lately and why they are going to achieved greater results with certain trends than with others. All of these different strategies are calculated in a 14 days period, which is the typical value to the RSI, while the barriers of oversold and overbought that generate signs of buy and sell when are crossed, have been moved in order to adapt to each specific trend, having bullish trend higher values of both barriers and bearish trends lower values of both barriers.

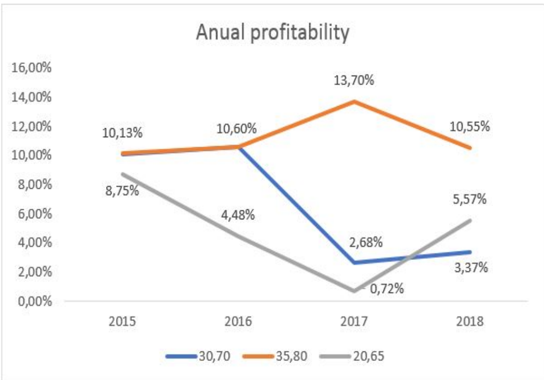
Then, it is going to follow the same procedure with the MACD, which is going to be presented and calculated, deeply in certain details of it to a better understanding and making easier the comprehension of the three different strategies that have been developed with this indicator.

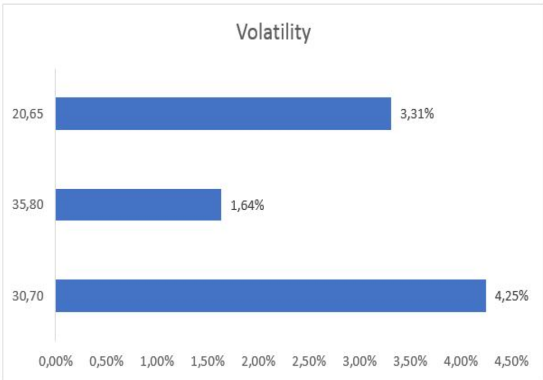
In the third chapter are explained the tools that have been used to the development of this project. The MATLAB´s App has been the main tool used during all the project to test and get the results of each of the strategies made and to be able to look different performances and indicator reactions, in a visual way, to the different changes that have been applied. In the App, there is an optimizer with genetic algorithms that is going to explain carefully and with more details. This optimizer is able to maximize the returns of a strategy made with a technical indicator by pondering positive streaks as well, although it is not the core target of this project it has been used at the end of the project to check if the strategy that have been developed during it, are very distant to the most optimize one or if opposite the performances obtained just can be improved a little. Genetic algorithms is a kind of machine learning that takes a random population and by ranking all the members of this population and selecting only the bests, can reproduce them and create a new and better population than the last one. This process is repeated a great number of times until the improvement between populations or the best of each population meet the requirements imposed.



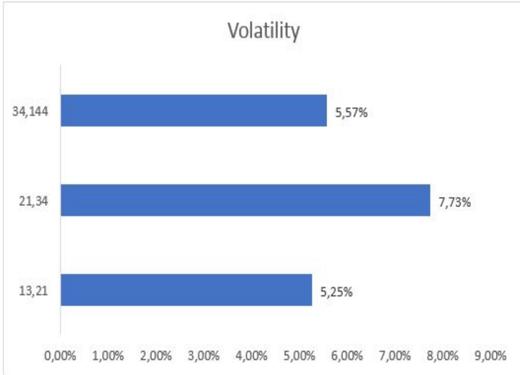
In this point of the project, after view all the theory about techniques that are going to be applied and after familiarizing with the tools used, the performances of the project are presented.

Firstly, starting with performances of the strategies based on the RSI. All the strategies have been applied to all the groups, excepts the one that assign the barriers of oversold and overbought in 50 and 50, which just have been applied to groups with lateral movement. The results of each group with each strategy are shown and commented, including some unexpected results that have been explained carefully. When all the performances have been analyzed group by group, a global study about the performance of each strategy with all the portfolio is done, here it is shown, which are the strategies that best can be adapted to the portfolio in terms of profitability and volatility as well. In general, there is a best performance with uptrend strategies, probably because 7 of the 11 eleven stocks that composed the portfolio are uptrends or have a lateral movement uptrend. One of the most important conclusions that have been obtained with this project is the poor performance of the classic strategy with the RSI of buy when the value cross 30 and sell in 70 in comparison with other strategies, which means that new strategies more accurate to each group get better performances than the classic one. Just 3 of the 8 strategies are shown in the figure.





The analysis with strategies based on the MACD has been the same as with the RSI, the unique difference is in the division of the portfolio in just two groups of stocks, bullish and bearish trend. Strategies with MACD are more focus in the length of the investment period, long, mid and short term but better results were expected with the short-term strategy in the bearish trend group of stock and with the long term strategy in the bullish group. The differences between these strategies are in the duration of the long and short periods that determines the values of the moving averages, but also some movements in the value of the histogram that identify the difference between the bullish and the bearish trends have been done to the strategies to the mid and long term.



All the details about the operations and the performances with each stock are as attached documents in the last chapter.

Once both technical indicators have been evaluated and analyzed, it has developed a strategy that collects the best strategy of each year and join them into just one strategy, it means as each year if it would be implemented the best possible strategy based on the MACD or in the RSI. It is just to compare this hypothetic case with the best case just based on the RSI and the best case with the MACD, because it is impossible to know at the begin of each year, which strategy will be adapted better each year.

Finally, there has been exposed a relationship between technical indicators with news and the possibility of make investment strategies complementing each other and an optimization to the strategies based on the MACD with the optimizer of the metaparameters, which works with genetic algorithms and the huge chances that are opened to the future in this field.

To relate news with technical indicators has been selected 11 news, one of each stock, that are considerably relevant to the stock´s company and that have happened during the period when the strategies are implemented. The conclusion of this experiment is that both technical indicators cannot predict the effects of the news in the stocks because they only change with price´s changes but if they are prepared to react in the short term as the first strategy apply with the MACD, they could identify very fast the change in the trend and make a buy or sell operation, depends of the new, by taking advantage and making a profitable operation because of the reaction to the news.

In the optimization with the genetic algorithm is achieved a greater result than with the strategies used but the difference is not very big, so it means that the strategies used has been well selected. This algorithm can be improved more in order to maximize these profits and improving the volatility as well with more stable strategies.

Resumen del proyecto

En este proyecto se van a llevar a cabo un análisis de estrategias de inversión basadas en dos de los indicadores técnicos más extendidos a nivel mundial, como son el RSI y el MACD. Para ello se va a realizar un estudio en profundidad de ellos, que abarcará desde su historia, la evolución que han tenido, como se calculan y como se pueden adaptar para realizar estrategias de inversión rentables.

En el primer capítulo se hará una breve introducción de lo que es este proyecto, en que se va a enfocar, como se encuentra actualmente la cuestión a tratar y como se han hecho los diferentes análisis y evaluaciones. En este capítulo también se expondrán tanto los principales objetivos de este proyecto como la metodología que se ha seguido para el cumplimiento de estos.

El principal objetivo que ha seguido este proyecto ha sido un estudio riguroso tanto del RSI como del MACD, para la implementación de estrategias de inversión únicamente basadas en ellos y capaces de obtener buenos resultados en cuanto a rentabilidad y volatilidad de los rendimientos anuales de estas. Una de las principales ventajas que tiene este tipo de análisis y de estrategias es que una vez que han sido desarrolladas y están listas para comenzar a operar con ellas, el tiempo de seguimiento que requieren es mínimo frente al que requieren otras estrategias, que incluso basadas en análisis técnico son algo más complejas que estas. Por lo que si se consigue que estos indicadores por sí solos sean capaces de dar señales de compra y venta con el simple seguimiento de sus valores a diario, no solo obtendríamos una forma rentable de invertir si no que se podría ahorrar muchas horas de otro tipo de análisis.

Para analizar y evaluar el impacto que tienen estas estrategias en el mercado real, se han seleccionado diferentes tipos de estrategias que han sido aplicadas a acciones del mercado español y americano y que siguen diferentes tipos de tendencias, durante el periodo analizado. El conjunto de acciones que ha sido seleccionado se ha dividido en 4 grupos diferentes dependiendo de la tendencia que siguen cada una de estas acciones, con el RSI, mientras que con el MACD han sido únicamente 2 los grupos en los que han sido divididas las acciones. Los grupos son los siguientes:

- Tendencia alcista: United Health Group, Merck and Co y Abbot Laboratories.
- Tendencia bajista: General Electric y Kraft Heinz Company.
- Movimiento lateral alcista: Facebook, Visa, Mastercard y AbbVie.
- Movimiento lateral bajista: Enagas y Zardoya.

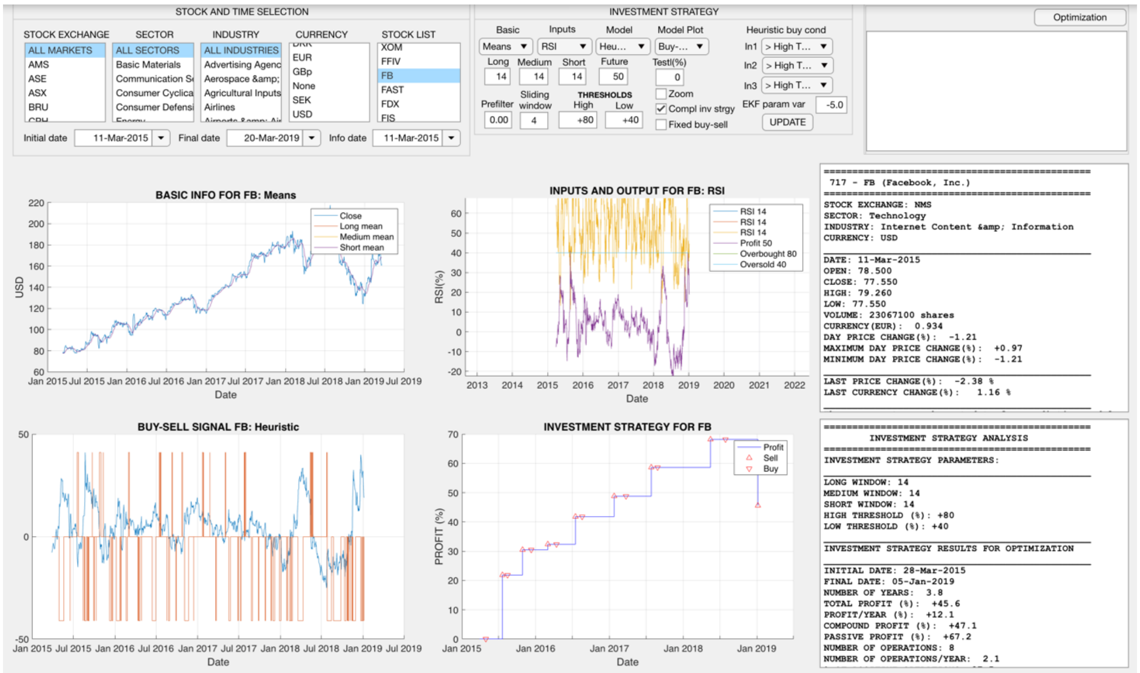
En el segundo capítulo se explican ambos indicadores más en profundidad, para ello, este capítulo comienza con una introducción al análisis técnico. En esta introducción se habla de la historia de este tipo de análisis, no solo con acciones, sino desde sus inicios con cualquier otro tipo de mercado de activos, también se explica la evolución que ha tenido a lo largo de los siglos y la situación en la que se encuentra en este momento junto con la importancia que ostenta en los mercados bursátiles.

A continuación, es explicado el RSI en profundidad, al igual que con el análisis técnico se comienza con un repaso histórico del indicador y que objetivo tenía desde el principio. Después se desglosa y analiza en profundidad su cálculo, para una correcta asimilación del concepto y una buena implementación y adaptación de las estrategias que se propondrán para cada uno de los diferentes grupos. Todas las estrategias basadas en el RSI con las que se trabajan son calculadas en un periodo de 14 días y reaccionarán con una señal de compra cuando la acción se encuentre sobrevendida y con una señal de venta cuando la acción se encuentre sobrecomprada, por lo que, van a ser las barreras que delimitan las zonas de sobrecompra y sobreventa las que irán variando y determinando si las compras y ventas de las posiciones se deberán realizar con valores más o menos altos. Normalmente se aumenta el valor de ambas barreras para acciones que han seguido una tendencia alcista y se disminuyen para acciones que han seguido una tendencia bajista, las cuantías de estas subidas y bajadas dependerá del objetivo que intentemos alcanzar.

Para finalizar este capítulo se va a seguir un procedimiento similar al seguido con el RSI, pero en esta ocasión con el MACD, el cual es presentado y calculado, profundizando en dicho cálculo para asimilar correctamente los conceptos y así poder realizar estrategias que sigan un razonamiento lógico. Para el MACD se han llevado a cabo 3 estrategias diferentes, que varían en función de la longitud de los periodos con los que son calculadas las media móviles y las barreras que delimitan las zonas de tendencia alcista y bajista también son modificadas.

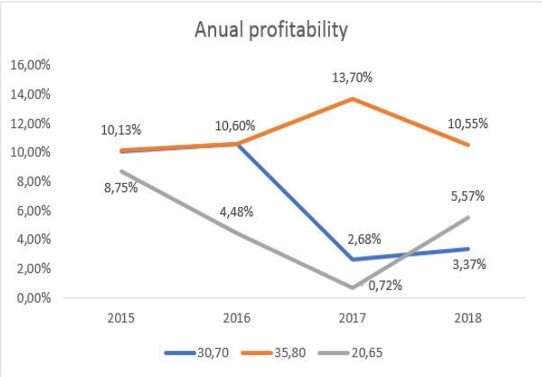
Durante el tercer capítulo, se explican las herramientas con las que se han llevado a cabo las estrategias de ambos indicadores. La herramienta principal es la aplicación de MATLAB, con la que se han puesto a prueba las estrategias en las diferentes acciones durante un periodo de tiempo de 4 años. La aplicación además de implementar todas las estrategias, ayuda de forma muy visual a la compresión de todos los indicadores, como se representan gráficamente las estrategias realizadas, las señales de compra y venta y cuales se han llevado a cabo.

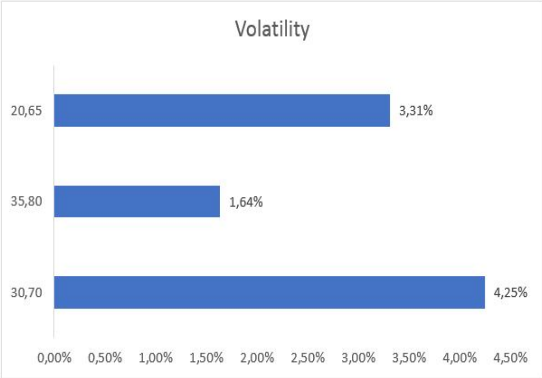
En segundo lugar, se encuentra el optimizador de metaparámetros a través de algoritmos genéticos, el cual se encuentra integrado dentro de la aplicación, se puede ver en la parte superior derecha de la imagen. Este optimizador, consigue hallar la estrategia más rentable posible, también ponderando las rachas positivas de operaciones, para ellos sigue el siguiente procedimiento, en primer lugar selecciona una población aleatoria que es evaluada y con la que se hace un ranking, del cual son seleccionados únicamente los mejores, esta nueva selección se reproduce formando una nueva población y se realiza el mismo proceso, esta iteración es llevada a cabo un número determinado de ocasiones o hasta que los resultados de las poblaciones son muy similares.



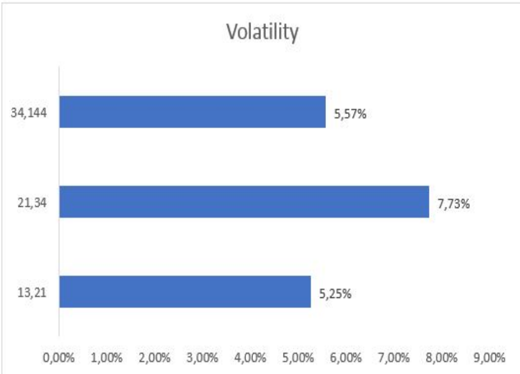
Tras la familiarización tanto con los conceptos teóricos y estrategias llevadas a cabo como con las herramientas que son utilizadas, se analizan en el cuarto capítulo los resultados de cada una de las acciones con cada una de las estrategias.

Primero son analizados los resultados obtenidos con el RSI, los resultados obtenidos con cada acción y con cada grupo de acciones son analizados en general y ciertas anomalías que hayan podido ocurrir con algunas acciones, tanto para bien como para mal, son comentadas y explicadas el porqué de estas y por qué no eran esperadas. Después son analizados los resultados de cada una de las estrategias aplicadas a toda la cartera de acciones en su conjunto, excepto la estrategia con límites en 50 y 50, que únicamente ha sido aplicada al grupo de acciones con movimiento lateral. Por lo general las estrategias seleccionadas para tendencias alcistas han obtenido mejores resultados, en parte porque 7 de las 11 acciones que componen dicha cartera, mantienen una tendencia alcista o con movimiento lateral alcista. Cabe destacar una conclusión muy importante que puede ser observada de este análisis y es que la tradicional técnica de trabajo con el RSI que establece los límites de sobrecompra y sobreventa en 70 y 30, ha obtenido resultados considerablemente peores que muchas de las estrategias. En la imagen solo aparecen los rendimientos de 3 de las 8 estrategias aplicadas.





El análisis de las estrategias basadas en el MACD se ha hecho de una forma similar al realizado con el MACD, con la diferencia de que la cartera de acciones únicamente ha sido dividida en dos grupos, uno con acciones con tendencia alcista y otro con tendencia bajista. Las estrategias seleccionadas con este indicador se diferencian en la longitud de los periodos con los que son calculados las medias móviles, se han llevado a cabo tres estrategias diferentes para el corto, medio y largo plazo, y la barrera de separación de tendencias en el histograma, también ha sido desplazada para adaptarse mejor a cada una de las situaciones.



Todos los detalles de las operaciones de cada una de las estrategias con cada una de las acciones se encuentran recopiladas en el último capítulo de documentos adjuntos, en este se pueden ver desde las fechas de compra y venta de cada operación como los rendimientos de cada operación de forma mas detallada.

Una vez que todas la estrategias han sido evaluadas y analizadas, se ha desarrollado una estrategia que asocial las estrategias con mejores rendimientos en cada uno de los diferentes años, esto es poco real ya que al comienzo de cada año no sabemos cual va a ser la mejor de las estrategias dicho año, pero se ha realizado para comparar la diferencia de esta con las mejores estrategias, llevadas a cabo con el RSI y con el MACD y si su diferencia era muy significativa, tratando de evaluar si dichas estrategias habían sido no solo las que habían obtenido mejor rendimiento en general o si este resultado también se podía ver reflejado en los diferentes años por separado.

Para finalizar, se ha estudiado la relación que existe entre las noticias que afectan directamente a las compañías que representan las acciones y los indicadores técnicos. Además, de una optimización ya comentada anteriormente de los parámetros del MACD, con el optimizador que trabaja con algoritmos genéticos.

Para el estudio de la relación de las noticias con los indicadores se han tomado 11 noticias relevantes ocurridas en el periodo estudiado, cada una de ellas de una de las 11 acciones que forman la cartera, y se ha observado cómo reaccionan los indicadores a ellas, concluyendo que, aunque estos no puedan anticipar el impacto que tiene la noticia sobre la acción, ya que estos únicamente responden a cambios en el precio de la acción. Sin embargo, si que pueden aprovechar las tendencias que estos generan si están preparados para reaccionar en el corto plazo, como es el caso de la estrategia que sigue el MACD para este espacio temporal.

Con la optimización con algoritmos genéticos se ha obtenido una mejora en el rendimiento de la cartera con estrategias basadas en el RSI, aunque este incremento no ha sido tan notable como se podría imaginar. Esto significa que la estrategia ganadora del MACD ha dado muy buenos resultado. Con esta pequeña aplicación de machine learning a este indicador se abre una ventana de posibilidades a un campo que aún le queda mucho por explorar y que puede ofrecer muchas oportunidades en el futuro.

Key words

RSI, MACD, technical analysis, genetic algorithms, investment strategies, visual trading, technical indicators.

Palabras clave

RSI, MACD, análisis técnico, algoritmos genéticos, estrategias de inversión, análisis visual, indicadores técnicos.

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1. Introduction to the project.

1.1. Motivation of the project.

It is used to read and listen a lot of news about Wall Street, bubbles in the stock markets, people that lose all their savings because of a sharp decrease and others that become to be rich with some stocks, such as people with the cryptocurrencies in the last few years. All this news and this information use to talk about the variability of prices in the markets as a consequence of an important movement of a big bank, the rise in popularity of an extreme politic party or a new law dictated by the government, prohibiting or allowing imports or production and distribution of new products, such as weed in Canada and some states of U.S. last year.

In this project, it is going to be processed a visual study of stocks trading, assuming that the infinites reasons that affect the stock are reflected in the price, so the analysis is going to be based on some technical indicators, which will help in the difficult work of predict and understand trends and fluctuations. These technical indicators are the RSI (Relative Strength Index) and the MACD (Moving Average Convergence and Divergence). How Charles D. Kirkpatrick talked about in his book Technical Analysis, technical analysis is based in the follow's assumptions: (KIRK11)

- Stock prices are determined solely by the interaction of demand and supply.
- Stock prices tend to move in trends.
- Shifts in demand and supply cause reversals in trends.
- Shifts in demand and supply can be detected in charts.
- Chart patterns tend to repeat themselves.

It is going to be associated different stocks that have similar trends and react in a similar way in different scenarios, finding structures in a collection of unlabeled data that could help to take the most appropriate investment strategy.

The technical indicators used in this study to create the different investment strategies, are the RSI and the MACD, as commented before. While the RSI represent the "strength" of the stock and with which you can determine if a stock is overbought and sell it or oversold and buy it, basing an investment decision just supported on it, as James Chen explained in Essentials of Technical Analysis for Financial Markets

(CHEN10). The MACD identify changes in trends creating the possibility of make investment decision by creating buy signs when the stock enters in a bullish trend and sell signs if it goes to a bearish trend.

This project will focus in the analysis of these indicators in different stocks to show where are the optimal frontiers and periods to calculate the value of them and to determine if a stock is overbought (you should sell), or if the stock is oversold (you should buy) with the RSI, and if a stock is changing his trend from a bearish to a bullish and conversely with the MACD.

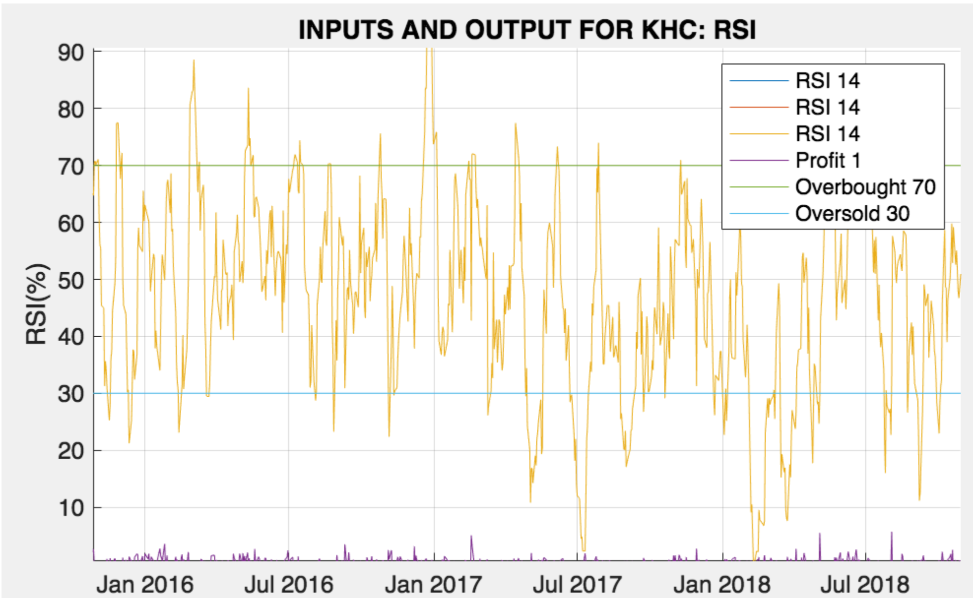
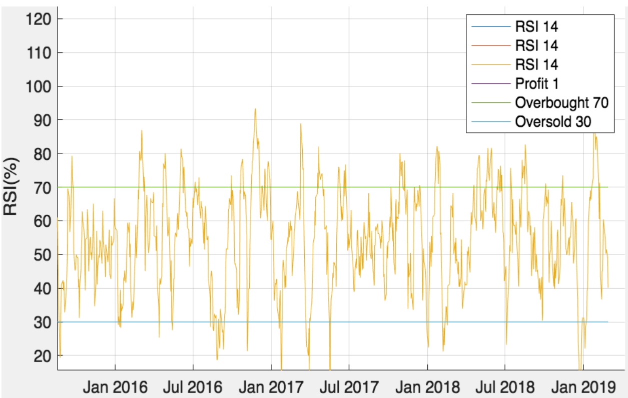


Figure 1. RSI (14 days period). Kraft Heinz Company between 2015 and 2019



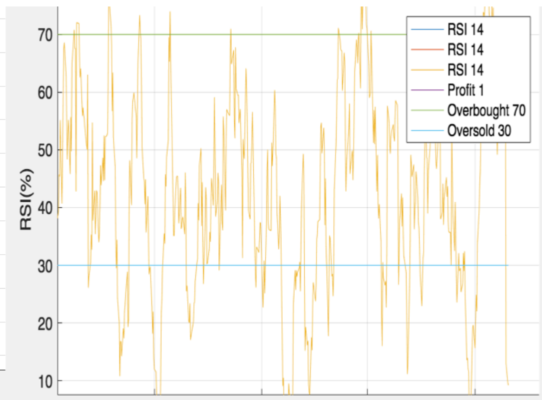


Figure 2. RSI during a bullish trend.

Figure 3. RSI during a bearish trend

These three figures show how the RSI works in different scenarios. The horizontal lines, up and down, represent where are the barriers of oversold and overbought, respectively.

So, the optimization consists in the variation of the lines of overbought and oversold to make the best and most profitable investment decision. The function to calculate both indicators is integrated in the App with other indicators and data of the stocks that will help in the process of decision making. It has been tested just with growth trend; it means make a buy decision when stocks are oversold and then sell them when stocks are overbought.

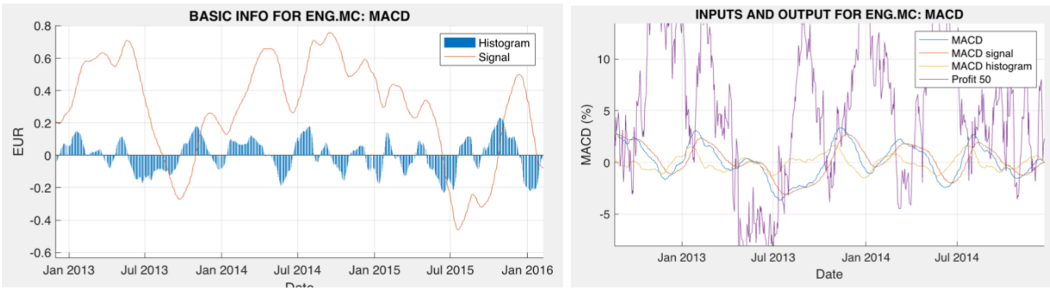


Figure 4. MACD short term periods (21,13,1). Enagas.

In Figure 4 it is shown the MACD, its signal line and the histogram. However, in this case, as the signal line and the MACD are very similar, the histogram is very small because it represents the difference between the signal line and the MACD, it will be explained better in the next chapter. In this case the frontier that separate an uptrend to a downtrend is in the zero, representing all the values above it an uptrend and all the values under it a downtrend.

Then, once frontiers have been choosed to make investment decisions, it has been created different strategies with different performances in order to create a range of portfolios, targeting different objectives with higher or lower risks.

All this investment process has been developed just by the used of these technical indicators, which is the main objective and the motivation of this project. Each of the portfolios will have stocks of a wide range of industries and different stock´s markets.

1.2. State of the problem.

The history of technical analysis began far away, such as Charles D. Kirkpatrick exposed in his book Technical Analysis. Since the 18th century there are books and models explain trends and states of the prices, trying to understand how the markets run. However, it is conceivable that technical analysis, in some form, was used in the distant past in freely traded markets, which have existed for centuries. Specifically, it is known notes and checks between traders and bankers from Babylon 2000 BC or currency exchanges, commodities and participations in mercantile voyages in Ostia, which was one of the biggest ports of the Roman Emperor. But, because it was in Japan where have been founded the first technical rules recorded, many historians have suggested that technical analysis began in the rice markets in Japan. (KIRK11).

Today, interest in technical analysis is resurging. It is a science that is in a continuous developed with the creation of new models, the improvement of old models or the creation of new parameters and indicators to specify better the barriers and the fluctuations of the stocks, it is also explained by Charles Kirkpatick. There are hundreds of books and researches talking about this way of stock´s price analysis and there are thousands of traders that spend all their efforts day to day trying to implement them as well as possible optimizing them to make more profitable operations. (KIRK11).

Falling commissions and maximum speed of communication have made technical analysis extremely useful to those who can spend time studying it. There are portfolios traded by software programmed by analysts and software engineers that are investing automatically without human intervention. Markets are more efficient, making competition extremely keen, which makes better most of the technical indicators, and with the advent of computerized markets, intermediaries, with their delay and cost have largely been eliminated. This is the most important advantage of the technical analysis versus the fundamental analysis, because once that it has been developed an investment strategy, the time that is needed to follow and review the strategy is minimum, while with the fundamental analysis, reviewing the strategy with all the news affecting the business of the company and with all the quarterly and annual results of it must be done, which means a lot of effort and hours of dedication to each stock, lot of analysts earning high salaries.

Charles D. Kirkpatrick also talked in Technical Analysis about the fact that there is not a magic formula to implement a strategy and always earn money, because although modern computer technology has demonstrated that prices are not random, they are not perfectly predictable, and the main reason is that people buy and sell items based not only on what they believe are reasonable expectations but also on emotion, specifically greed and fear, overconfidence, perception and prejudice, which are unpredictable today.

There are two different targets that you can expected by using technical analysis: predict the market or react to it.

The first one involves an important number of experts in this matter that earn money by writing articles in important finance newspaper, magazines or internet´s blogs about the predictions that they believe that are going to happen in markets, but are not always certain, if not they would be the greatest investors and everyone would invest money with them.

The second involves traders and investors that try to create specifics reactions (buy or sell), in function of certain markets conditions, this conditions could be about the company business performance (fundamental) or just about the stock´s price (technical). This second way of work is mainly based in the assumption that all market´s trends have happened any time in the past, so the key is to identify the fastest as possible the trend starts and be able to make a profitable operation as a consequence of the reaction to a market´s condition, as it has be done with the RSI and MACD.

It has been implemented a method, based on the RSI and MACD that has worked with different assumptions about each group of stocks, trying to achieve the most profitable investment, taking into account the volatility of the operations. In some way, it has done a small prediction of trends inside the markets, because although strategies are reacting to specifics conditions, they have to be able to detect the beginning of trends very quickly before the trends advanced too much and operations would not be able to be profitable.

As it has commented, technical analysis has a long history, but it is not outdated at all. Today with the advances in machine learning and artificial intelligence, there is a wide range of opportunities to implement this new technology in the stock´s market by using technical analysis. Such as, Saijiel Kishan, Hugh Son and Mira Rojanasakul commented in their article Robots are coming for these financial jobs*,* firms are rolling out machine-learning software to suggest bets, sets prices and craft hedges So, it means from thousands of new jobs positions in the largest firms of the industry, venture capitalist Marc Andreessen has said 100,000 financial workers are not needing to keep money flowing and these positions will transform in controller and developer of machine learning, to the possibility of investing your savings and make profitable operations constantly. (KISH17). However, unfortunately it is not easy at all. One of the keys is to understand really well how technical analysis operates is by knowing indicators and frontiers deeply.

From my personal experience, I have been interested in stock´s market since I was young. This interested began when I was around 8 years old (2005), I used to watch in the news how people around the world became very rich and all companies grew day to day in an unmeasurable way. I talked with my parents and they also had money invested, the rest of my familiars and the friends of my parents too. So, I thought, why I could not invest too if I had some savings and the next year, I would do my first communion, where I would receive a lot of presents. In this way, I asked my parents which were the most safety stocks and after my first communion I bought around 200 stocks of BBVA at the price of 11,91 euro per stock.

You can imagine my reaction being a 11 or 12 years old when I started to see how the biggest financial crisis in the history burst and I lost most of my savings, I could not explain anything I felt cheated by my parents at the beginning but with the time I understood that it had not been a fault of my parents if not mine, because I had put all my money somewhere that I did not understand and a lot less controlled.

In these years I have read a lot of books about stock´s markets, I use to read financial news as well and I have started to understand a little better why the stock´s price increase or decrease but I still being very far to predict with a high percentage of success when a trend is going to start.

For this reason, I have done a deep research and in a more technical way of the stocks market, implementing the knowledge acquired during these years. Analyzing the RSI and the MACD and being able to establish a method based just in analytical sources that cannot be affected by our impulsive behavior, which could give some good results but in long terms use to fail.

This project has a high potential of scalability and to implement to other strategies of investing being easily adaptable, so it will be very interesting and useful improve it by comparing and joining with other types of investment strategies which no necessarily have to be based on technical analysis if not in fundamental analysis as well.

1.3. Targets of the project.

With this project, it has been created a basic model just feed by technical data of the fluctuations, slopes and critical prices. This data have been reflected in indicators that are used every day by traders and investors, so it is relatively easy to access to them in any finance website. The information used to create the strategies and analyzed each stock has taken from a data base in MATLAB that takes data from yahoo.

The reason on focus only in information of the variability of prices is delete the infinites variables such as news, governments behaviors, international agreements, etc. that can affect the stock, these variables besides to be infinites and are very difficult to translate into practical knowledge of how is going to react the stock´s price and as it has mentioned the time that it requires it is huge, which finally means cost in form of salaries.

Hereby, it is assumed that is easier to make a technical interpretation of a price condition than try to understand human´s and company´s behaviors. Because it is true that human intuition could predict with knowledge and some experience future trends that can give very good results in short term. Although, when it is thought in investments at the long term it is better to think more about survey rather than make the most profitable operation ever, so it is better to delete any kind of feelings and intuition in order to survey as great investors in the long term.

Specifically, this project will be focus in achieve the following targets:

- Show where are the specifics limits of oversold or overbought and how they change depends of the kind of trend that follow the stock (bull or bear).
- Implement technical analysis with MATLAB´s App to have the possibility of make it more visual and make easier the process of decision making.
- Explain clearly and deeply the RSI and MACD to a complete understand of how they works, what they represents and how they can be very useful to make investment strategies.
- Determine when to make an investment decision based on the conclusion taken of the RSI and MACD.
- Optimize the classic parameters of technical indicators to achieve better performances of our portfolios by implementing genetic algorithms.
- Create different investment strategies that achieve different investment requirement not just looking in the profitability of the investment if not in the risk attached on it as well.

1.4. Methodology.

Firstly, it is required to familiarize with the App designer of MATLAB, which is the main tool to get the results and performances of the investment strategies. This App implements the RSI and MACD strategies with all the strategies taken.

After this, it is necessary a deep study of the RSI and MACD to understand how they are calculated, which are the standards investment decision that are used to take with them and think about some ways that these strategies could be optimize to get more profits or take less risk, which means improve the total performance.

Once the investment strategies have been decided, they are implemented with the MATLAB´s App, and all the data about these operations is collected and well organized with Excel, in order to make easier comparisons and conclusions taken about each of the strategies and their final results. This information of each strategy, includes averages of duration of operation, maximum and minimum profits, compounded and simple profits, buy and sale dates with the profitability and duration of each operation and other information that will be used to a better understand of how has developed the strategy during the whole period implemented, which are the weaknesses and the strengths of each strategy.

Then, it is added some information to the results given by the App, in order to get the results that are being looking for to compare and evaluate the performances of the investment strategy. This information are the dividends paid by the companies during the period of the operations, which will give the real profitability of each operation and each strategy, and the volatility of the cumulative profitability of the strategy during all the period that it has been implemented, which will be calculate with the cumulative profitability and will be shown with the rest of the information.

Once all the results are organized and collected, results have been associated in groups depending of the trends that have followed the stocks in order to compare the performances of each of the specifics strategies given to each trend. Finishing this evaluation with the performances of all the stocks with the same strategy, creating the performance of the whole portfolio with the same strategy and comparing them to choose the strategies that best adapt to each investment target.

After that, it would be optimized the parameters of the barriers to each stock by genetic algorithms, which will result in the best performance possible to each of the stock with a strategy based in the RSI and in the MACD.

Finally, it is has explained and commented briefly the relationship between these technical indicators and important news that have affected the company during the period the strategy works and if the indicators are able to identify them and how many time have they use to do it.

1.5. Resources.

In this project, it has been used several articles and bibliography to a better understand of the technical and practical theories of the RSI and MACD that have been developed since they were created. These articles will complement to reinforce and contrast hypothesis and ideas that will be exposure during the chapters.

The App created by Juan Luis Zamora, one of the director of the project, with Matlab will be used as explained before, to get most of the results obtained by each of the strategies and will show in a visual way the performances and development of the stocks during all the period.

Finally a genetic algorithms that has been developed by Marta Villagran and Juan Luis as well, will give the possibility of a complete optimization of the parameters and barriers to each of the stock, getting the best final performance, and opening several ways of improvement to future strategies.

2. Technical indicators.

2.1. Technical analysis.

In this chapter is going to be covered an introduction to the technical analysis, which routes and history has briefly commented in the introduction of the project.

Technical analysis has been one of the matters that has been studied more during the last century, a huge number of different people have written and exposed articles about that, giving a lot of perspectives from different angles and point of views. The ability of read charts well and have a deep knowledge, and the ability of interpret technical analysis and indicators is very well recognized in the stock market, where it is possible to achieve really good performances and make profitable operations without dedicate a huge amount of time, as for example could require a fundamental analysis of the stock. However, in the same way the penalties to the investors that without experience and very little knowledge about stock markets and interpretations of technical signs, invest on it could be calamitous.

“Simply put, technical analysis is the study of prices, with charts being the primary tool.” (ACHE01).

Technical analysis is a science that study the evolution of stock prices by recording the historical data about it and its averages to then predict futures movements and trends on these prices, graphs is the most common tool to implement it.

Most of the technical analysts use to work with charts to interpret and identify in a faster way the trends and signs of buy and sale operations. It has been developed an infinite types of charts in multitude forms and styles to be able to represent on them most changes that takes place in the stock price as well as be able to plot an index derived therefrom. (EDWA18).

The duration of the collected data about the price to get a buy or sell sign can be very different, for example, it is possible that all the changes that involves a stock during a month, would be condensed into just one or anyone entry to an operation or in the other hand could happen a couple of transactions in just an hour. So, with technical analysis can be taken strategies with same critical values of the barriers that identify buy and sell sign just changing periods of the technical indicators. So, periods that are used to take most of the times can be changed in order to identify long terms trends or intraday trends.

Emotions have a key role in every investment decision and operation that it can be taken, but this role is bigger in technical analysis, this is one of the main reasons of the automatic developed systems that use powerful computers to realize the investment operations, to avoid any kind of feeling or emotions that can cause a wrong investment decision. If these emotions were completely separate from our decision and our behavior were completely guide for logical assumptions, then the fundamental analysis would work perfectly, it means the buy of a company´s stock based on the earnings, EBITDA, future cash flows and discounts in comparison with similar companies of the same industry would be the suitable way of investment.

Unfortunately, it is not the reality and a big number of our decision are in big part influence by our emotions. If this theory really works well, the stock prices just could change with the news and reports of the companies that would affect the future of the companies, the unique work of the investor would be find the most discount stocks in the market, expecting a logical turn into its price. However, it would be an impossible work because the conclusion of the theory is that every stock would reflect its intrinsic price, so the forecasts would not have sense if any report or new has made. (FAMA95).

“There are two times in a man´s life when he should not speculate: when he can´t afford it, and when he can.” (TWAI97)

With this comment Mark Twain is saying a very important concept that everyone must understand before invest in the stock markets or in any market. Speculating is not investing, speculating is the investment decision taking in the short run and without a solid based supporting it. It could be very dangerous, so it is a good reminder to understand better the difficult and hard work that supposed the creation of investment strategies.

In this project, it has worked and it has made investment strategies based on two technical indicators the Relative Strength Index (RSI), which identify when stocks are overbought and oversold, and the Moving Average Convergence and Divergence (MACD), which is very useful to identify change in trends.

2.2. RSI.

2.2.1. Introduction.

RSI (Relative Strength Index) was created in 1978 by J. Welles Wilder Jr., who added it to his seminal book in 1978, “New Concepts in Technical Trading Systems”.(WELL78) This index is a momentum indicator and is widely used to identify and measure the magnitude of recent prices changes in order to know if the stock or any other asset is oversold or overbought, with RSI it is also possible identify the kind of trend, it means if it is bullish or bearish but this function will be covered better by the MACD. It is assume during this work, that it has been working with two of the most efficient markets in the world, the American and the Spanish, what is a great advantage to the both indicators that work better and are designed to be used in efficient markets. In a non-efficient market as one of a developing country, which would not have global strategies and would need specific strategies to this market that could collect the specific characteristics of it.

This indicator has a range of values between 0 and 100 and it is used to look in a graph between two lines or barriers that point out the oversold and overbought zones.

Historically, 70 and 30 has been the most used values to identify these zones of overbought and oversold, if the RSI is above the line of 70, it means that the stock is overbought, the price is rising but probably too much, so in all of the investment strategies that have been taken, it has represented the sell zone. In the other hand, when the stock is under the line of 30, it means that the stock is oversold, so in terms of investment decision, it is going to be an opportunity to buy the stock with a good price, with this judgment, it is tried to buy the stock with discount, a great opportunity of buy. It is just like when someone go shopping and is always looking for clothes with a great discount, so a smaller value of the RSI could be traduced as a cheaper price of the stock.

But these measures are not the same in all situations, so it is required a deep study about the past of the stock and look carefully how the stock is evolving to identify these different situations and adapt the barriers of oversold and overbought to them, depends on the kind of trend that involves the stock in a period longer than the one taken to the calculation of the RSI.

There is a simple rule that attribute a higher value to the overbought and oversold zone during an uptrend period while during a downtrend period these barriers go down. However, as most indicators it is a bit relative and you need to analyze carefully each situation and judge how higher or lower are going to be these barriers, what requires a lot of knowledge and experience in the matter.

During this project are varied these limits and looking the performance of them in different stocks of different industries and different stock´s markets, trying to identify patterns that can be used as investment strategies to future decisions.

2.2.2. Formula.

In this section it is exposed how is calculate the RSI and which are the steps that has to been followed to get it. Although it could seem an extremely complicated calculus, it is not and with just two simple formulas it can be calculated. To calculate the RSI it is needed to compare the last changes in the stock price, so the calculation is divided in two main parts, the first one it is the calculation of the RSI_1, that is the result of the following formula:

$$RSI_1 = 100 - \frac{100}{1 + \frac{Average\ gain}{Average\ loss}}$$

Average gain: is the percentage of days gain during a look-back period.

Average loss: is the percentage of days loss during a look-back period.

This look-back period uses to be 14 but you can modify it, in order to see different RSI moving with different velocities, depends on the length of the period, 9 and 25 are also values very used by technical analysts. There are also some investment strategies that are based in the crossing of the RSI with different lengths.

Once, the RSI_1 has been calculated, it is proceed the second part of the calculation that is going to be the final RSI:

$$RSI_2 = 100 - \frac{100}{1 + \frac{Previous\ average\ gain * 13 + Current\ gain}{Previous\ average\ loss * 13 + Current\ loss}}$$

Actually, this formula take into account 15 days instead of 14, because if it is been taken a look-back period of 14 days and then it is added the current gain or loss to it, it is obtained a total of 15 days, with the detail that it is been weighted more the last one.

With these formulas it is possible to calculate the RSI, and then plot it in a graph with the values of the previous sessions, as the stock´s price.

2.2.3. Investment strategies.

The RSI is the best indicator to identify the situation of oversold and overbought of a stock, so it is going to be developed and implemented, some investment strategies based on them. These strategies will follow, all of them, a similar structure by buying the stock when it is oversold, it is cheap (has a discount), and the sale of a stock when it is overbought, it is expensive.

However, although it could seem that buying cheap and selling expensive it is always made big profits, it is a little relative, because depending on the trends, the barriers of overbought and oversold may change and if the strategy is not able to identify it by having the limits of most adequate strategy, it could maintain a stock that is continuously going down, in a bearish trend for example or not selling a stock when it reach his highest price.

However, it is not the only type of investment strategy that it can be taken with the RSI and it can be combined and complemented with other indicators as well. There are some strategies, one of them called “wrong RSI” that agree with the fact that it is recommended to buy the stock when it is overbought because it is in a bullish trend and sale it when the stock price is oversold because it is in a bearish trend, so it would be completely the opposite that it has seen before. In this project has not been done any investment strategy with this way of used of the RSI.

All the strategies has been applied to all the groups of stock to test them and check if it has worked as expected or it has had another kind of behavior different to the expected. Now it is going to be explained the different strategies, how they work and why it is expected to obtain better results with certain strategies in each of the groups. To do it, it has been divided in three sections that represent each of the stock´s groups, in each section are explained the most appropriate strategies to this group and why other strategies will not work as well.

- **Stocks with a solid bullish trend**.

  This group of stocks are characterized because of a long period of continuous price increasing. So barriers of the RSI are going to be adapted by increasing both the values of oversold and overbought. In this scenario, the RSI it is not going to fluctuate around 50 as it is supposed to be usually, if not it is going to be fluctuating in higher prices, because of the long term uptrend, a value that could be normal to a standard stock or a bearish one in this case could be a sign of buy, while a value that could represent a sign of sale to other types of stock, in this case could be a standard value, not meaning anything relevant and without making any sell sign.

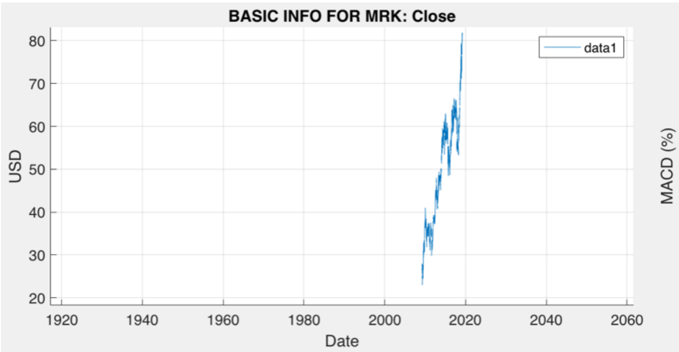


Figure 5: Stock´s price of Merk &Co.

It has been used different limits depending on the targets that are expected to achieve, there are some times that is preferred take more risk, measure by the volatility of the performances, and try to get a greater return and in other cases it is preferred to be more conservative by taking less risks.

Depends on it, barriers will vary between 30 and 55 the oversold one and 70 and 90 the overbought. It is not going to be very distance barriers at could be 30 and 90 in the same strategy, if not it is going to be moved between similar distances, being 55 the maximum distance between two barriers and 30 the minimum.

The most conservative strategy should be the one that has the lowest barrier of oversold, it means the one that tend to buy the stock at the cheapest price, but being in an uptrend group of stock it is also very important move up the line of overbought for avoid the lose of the potential of the bull trend. In conclusion, it is required to find a point of equilibrium where the stock is it buy discount but then it could reach a great amount of the up way.

The strategies that are expected to get greatest performances during a bullish trend are:

- 35 and 80.

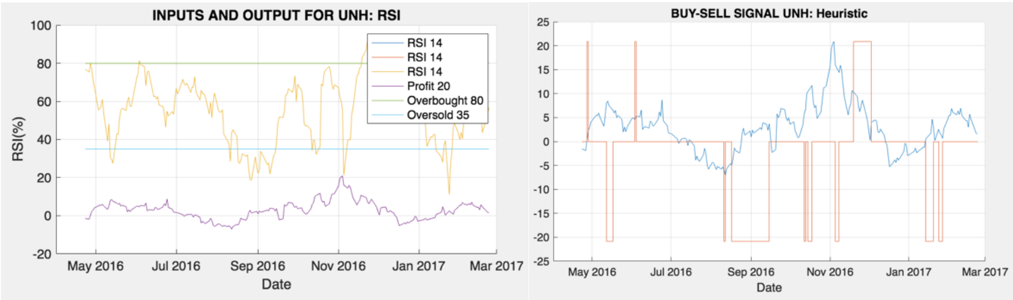


Figure 6: RSI and buy and sell signs identify by the strategy 35 and 80.

- 45 and 85.

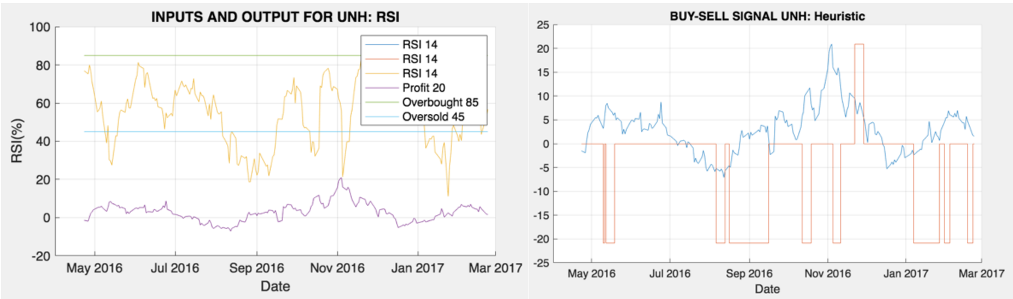


Figure 7: RSI and buy and sell signs identify by the strategy 45 and 85.

- 50 and 90.

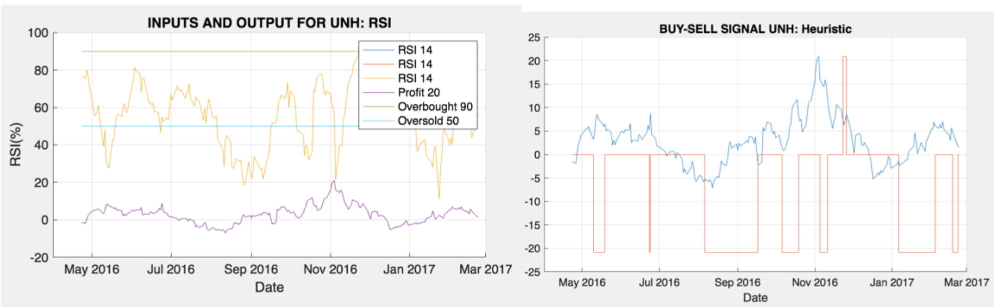


Figure 8: RSI and buy and sell signs identify by the strategy 50 and 90.

These strategies have the barrier of overbought above the 70, which is going to allow these strategies to not sell the operation during the "rally" of the stock, if not when it is really overbought to his situation and all or most of the potential of the uptrend has been achieved. In the other hand, strategies that have barriers of overbought under 70 are expected to sell the stock very early without earning any of the potential that is in trend, there would be some cases that a very low barrier of oversold could translate in very few and short operations because rarely a stock that is in an uptrend is going to be fluctuating between values under 30.

- **Stocks with a solid bearish trend.**

This group of stock have the opposite trend of the bullish group of stocks, they are characterized because of being in a long term downtrend, which will make more difficult the work of achieve positive and good performances with this group, if the target is to get profitability of the investment decision with this group of stocks, there would have to take advantage of the short uptrend periods inside the long bearish trend by discrimination of the most of the period taken.

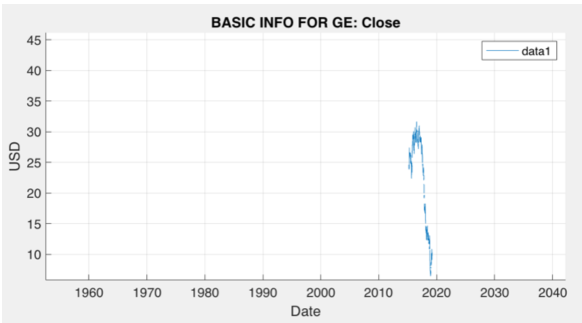


Figure 9: Downtrend stock of General Electric.

In this situation, it is going to expected the greatest performances with the opposite strategies that with the uptrend stock. Now, the barriers of oversold and overbought are going to go down for the same reason as with the uptrend group were moving up, because the value of the RSI is going to fluctuate, with these stocks, between lower values as normally.

The barrier in this case are going to vary between 10 and 30 the oversold one and between 50 and 70 the overbought, being the most conservative strategy. A low value of the overbought is going to be also very helpful, because is going to allow that the operation end faster, avoiding that a non-finish of the operation result in a long and downtrend operation, which would mean a terrible operation.

The strategies that are expected to be the most appropriate to this group are:

- 10 and 60

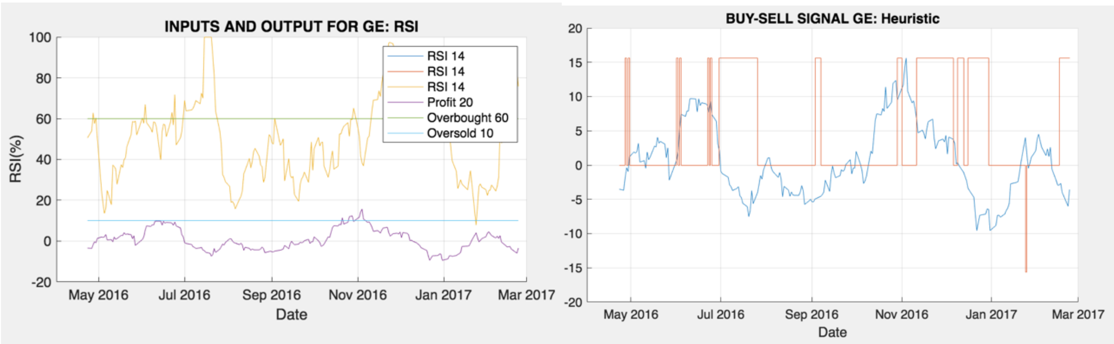


Figure 10: RSI and buy and sell signs identify by the strategy 10 and 60.

- 20 and 65

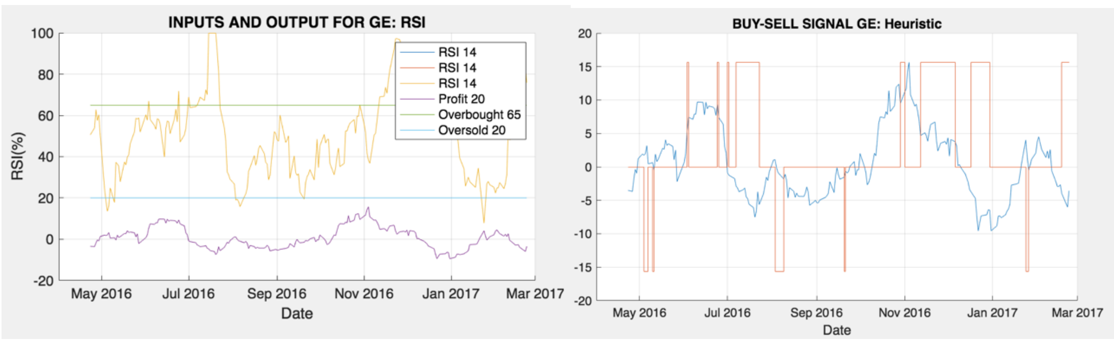


Figure 11: RSI and buy and sell signs identify by the strategy 20 and 65.

- 10 and 50.

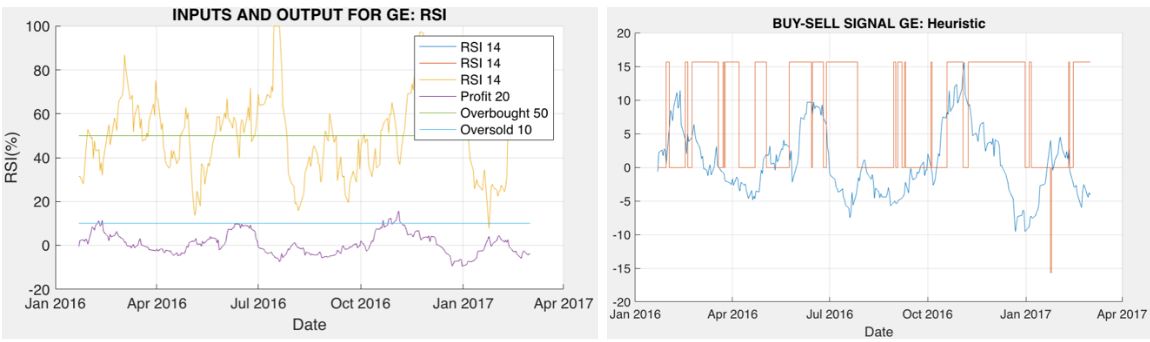


Figure 12: RSI and buy and sell signs identify by the strategy 10 and 50.

In this scenario, with stocks following a bearish trend it has been expected these strategies to achieve the best results because they are able to buy the stock at a really cheap price because of the low oversold line and sell it faster than the rest because of the low overbought line. Moreover, the low barrier of oversold allows the strategy to make few operations just making buy signs when the stock is very low.

With higher barriers of oversold and overbought, is expected to get normal signs of buy but rarely will achieve sell signs because of the high values of the overbought barriers, so the operations will be too long, which in a downtrend group of stocks is translated into losses.

- **Stocks with lateral movement.**

This group of stock is composed by stock that have not got a clearly trend during most of the period, but some of them are very near to have a bullish trend and other very near to have a bearish trend so it has been decided to divide them into two groups, with the stocks that have a lateral movement but very close to be bullish and the other group composed by stocks with lateral movement but very close to have a bearish trend. This division in two groups is to get different results with each of the groups and understand better which kind of strategy adapts better to each group and check that as it is thought the specific strategies are useful.

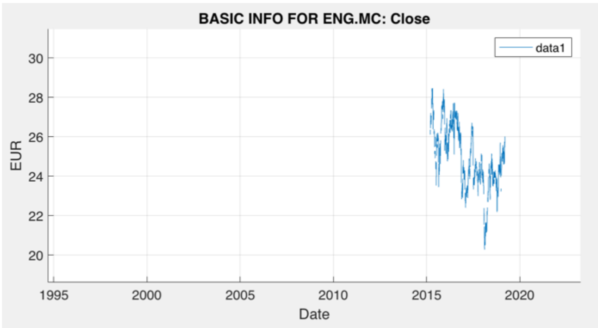


Figure 13: Stock´s price of Enagas.

In this situation and with stocks that have not had a clearly trend, it is very complicated to develop a strategy that can be specific to a group like this with these characteristics. However, the RSI is an indicator that use to adapt really well to this kind of stocks because these continuous movements allow it to get more information about fluctuations and identify good operations frequently. In these case, the RSI could also be associated with other indicators to make signs more accuracy. So, as this project has been done to understand better the behavior and the performance that can be obtain with investment strategies just looking to the RSI or the MACD the strategies followed are not going to be supported or complemented by other indicators.

Finally, it has been decided to apply to both groups of stock the same investment strategies expecting that the bullish strategy will adapt better to the lateral movement bullish group and the same with the bearish one.

The strategies that are expected to achieve better results with the group more similar to the bullish trend are:

- 30 and 70.

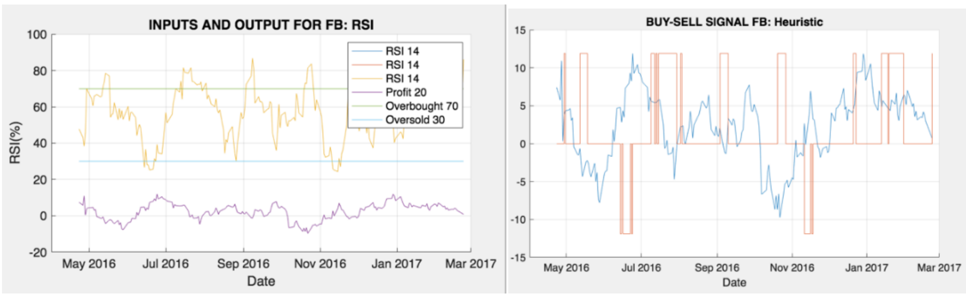


Figure 14: RSI and buy and sell signs identify by the strategy 30 and 70

- 25 and 80.

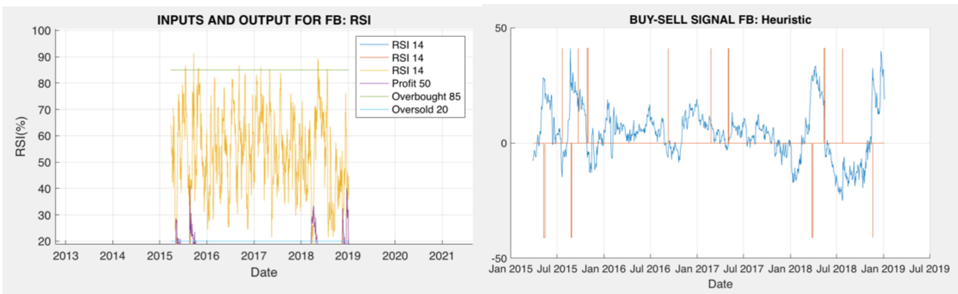


Figure 15: RSI and buy and sell signs identify by the strategy 25 and 80.

- 35 and 80.

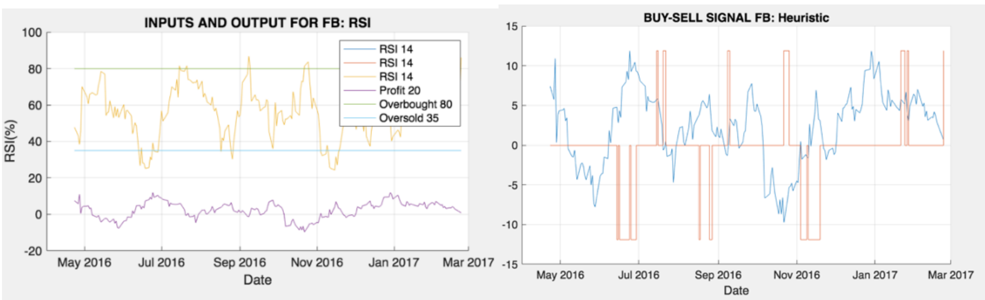


Figure 16: RSI and buy and sell signs identify by the strategy 35 and 80.

- 45 and 85.

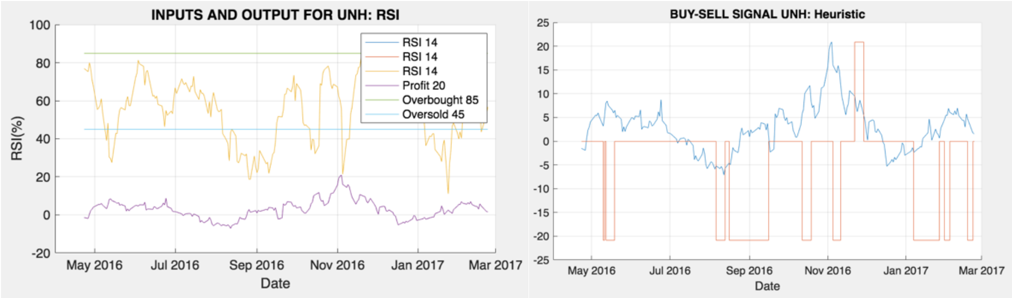


Figure 17: RSI and buy and sell signs identify by the strategy 45 and 85.

- 50 and 90.

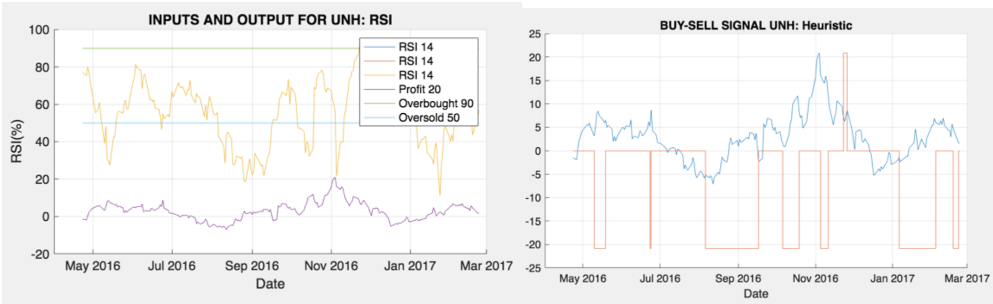


Figure 18: Stock´s price of General Electric 50 and 90.

The strategies that are expected to achieve better results with the group more similar to the bearish trend are:

- 30 and 70.

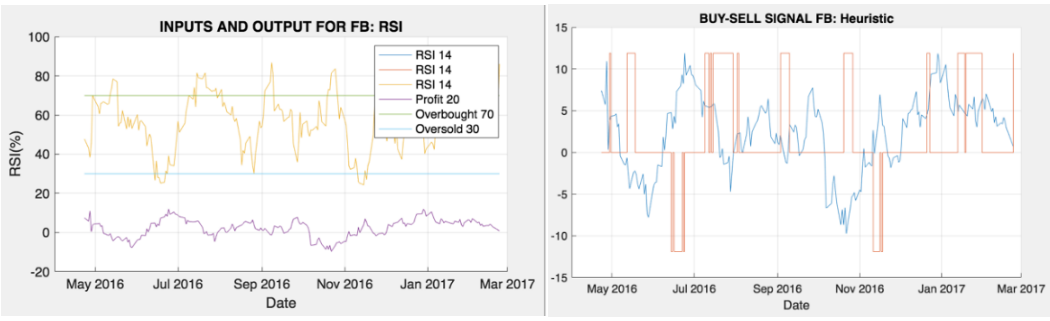


Figure 19: RSI and buy and sell signs identify by the strategy 30 and 70.

- 10 and 60

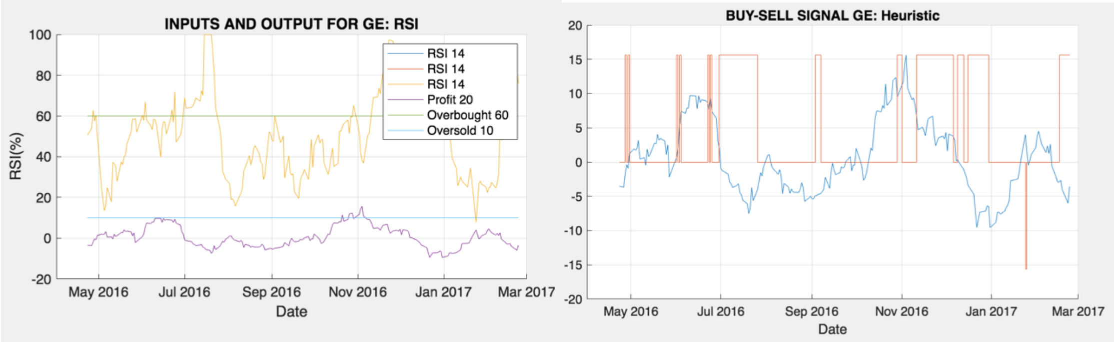


Figure 20: RSI and buy and sell signs identify by the strategy 10 and 60.

- 20 and 65

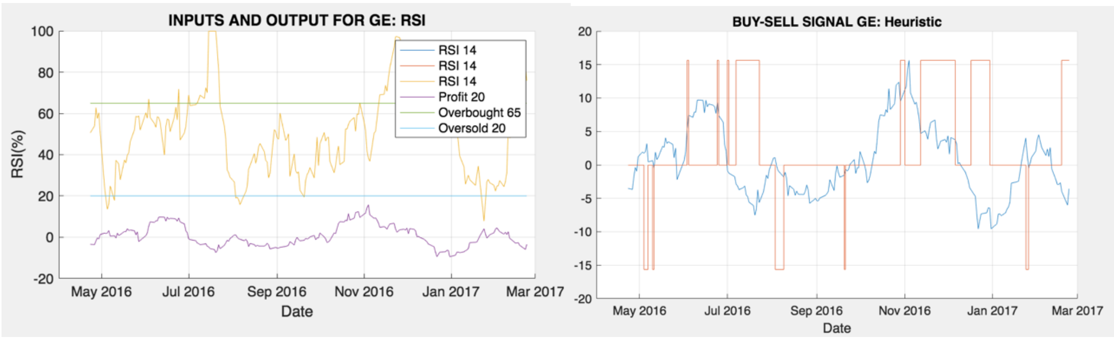


Figure 21: RSI and buy and sell signs identify by the strategy 20 and 65.

- 10 and 50.

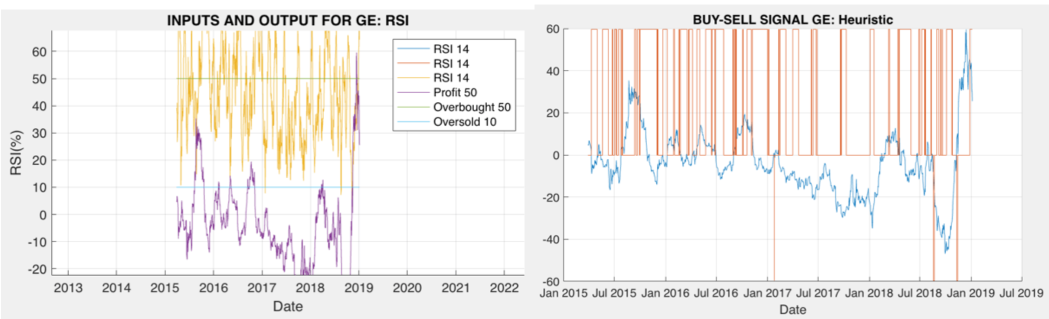


Figure 22: RSI and buy and sell signs identify by the strategy 10 and 50.

- 50 and 50.

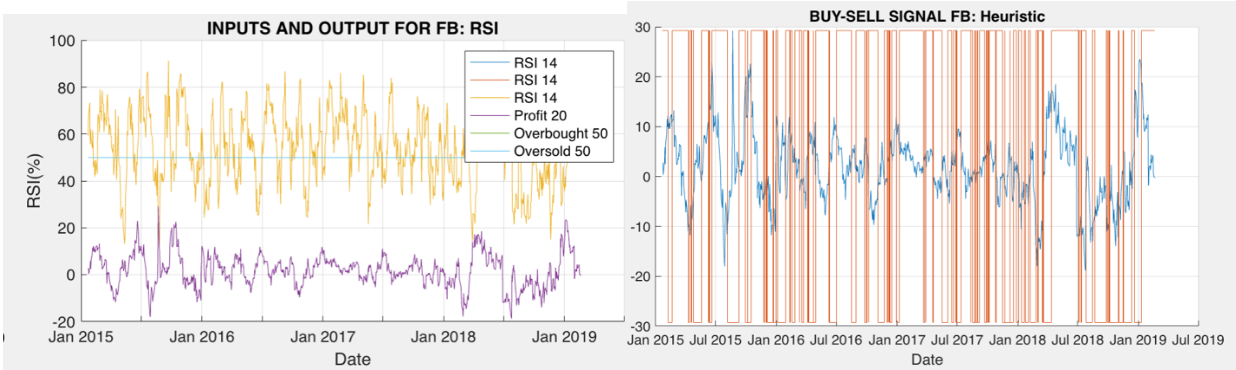


Figure 23: RSI and buy and sell signs identify by the strategy 50 and 50.

The reasons are the same as exposed to the bullish and bearish trend, only the standard strategy has been included because a strategy with barriers at 30 and 70 could adapt really well to the whole group as one if not differentiation would be done.

The RSI is a strong technical indicator that can be used in many ways to completely different stocks as it has been explained previously and as it would be checked in the chapter of the results obtained.

However, it has some important limitations, as the difficult work of identify reversal signs during a long term trend, which is it tried to do with the downtrend group of stock, because RSI is more reliable when it is conformed to a long period. The other big limitation to the RSI is that sometimes, it remains too many time in an oversold or overbought zones and this is also the other reason because of the investment strategies taking with a clear trend group of stocks vary a lot the standard lines of the RSI.

2.3. MACD.

2.3.1. Introduction.

MACD (Moving Average Convergence-Divergence), is a valuable technical indicator since 1980s, when it was created by Gerald Appel as an indicator of the change in a security´s underlying price trend, with the main assumptions that trends are expected time to time, it can be used to measure the increase in momentum and the overall strength of the market as well. (ROSE10)

It is one of the main quantitative indicators with the RSI that started being use in 1970s. They have been used to make investment decision from the combination of their values to the chart analysis. These indicators are in a high percentage of the purchase and sale recommendation about index and stocks that are made automatically, given them a great importance in futures opportunities of investing by implementing new technologies as Artificial Intelligence or Big Data. One of the greatest advantages of the MACD is that it is multipurpose because it can be used in every market with most of the assets and as a complement of most of the investment strategies.

However, it is not as easy as follow some given rules of each indicator and make a sell or a buy decision when all indicators meet the demands**.** For example, one of the main problems is what it is used to call the ambiguity in the indicators, which is the problem caused by the analyzed indicators, when in a certain period of time, the indicators generate different purchase and sale orders at the same time which will lead into a big confusion for the final investor that have not the enough experience and knowledge of how to react in each case. Although, having a large experience using these indicators there is no a formula that can be developed and give the perfect answer about how to react and what is needed to know to make a good investment decision in any of the millions of situations that can arises.

Today, MACD is still widely used as a strong trading indicator in the stock, Forex (currency market) and the index market. MACD shows characteristics of both a trending indicator and an oscillator, while the primary function is to identify turning points in a trend that are transform into buy and sell signs (ELLI05). Also, the level at which the signals occur determines the strength of the reading.

Despite the popularity and widespread of it, use among traders and practitioners, they have been much neglected in the academic literature compare with other indicators.

2.3.2. Formula.

The MACD is based on the convergence and divergence of two exponential moving averages, a fast one and a slow one, which represent the short and the long term respectively. The exponential moving average is calculated as:

$$\boldsymbol{EMA_{(t)}(N)} = \left[\frac{\mathbf{2}}{\boldsymbol{N}} * \left(\boldsymbol{P_t} - \boldsymbol{EMA_{(t-1)}(N)}\right)\right] + \boldsymbol{EMA_{(t-1)}(N)}$$

Where each of these elements mean:

$\boldsymbol{EMA_{(t-1)}(N)}$**:** exponential moving average at time t.

N: is the window length of the EMA (days, weeks, etc.).

$\boldsymbol{P_t}$**:** is the value of the stock/index at time t. (Closing value of the day t).

MACD omits non-trading days from computation.

Then you can calculate:

$$\boldsymbol{MACD\ line} = Period\ 1\ EMA\ - Period\ 2\ EMA$$

$$\boldsymbol{MACD\ Signal\ Line} = Period\ 3\ EMA$$

$$\boldsymbol{MACD\ difference} = MACD\ Line - MACD\ Signal\ Line$$

Period 1: period of the fast or shorter EMA.

Period 2: period of the slow or longer EMA.

Period 3: Period EMA for the signal line.

Signal Line: is an EMA of the MACD line, used to further smooth the indicator and it is interpreted as any MA crossover. It is slower than the MACD line. (BLOO19)

12 and 26 are the two most common values used to the fast and slow EMA respectively (MURP99). But they should be changed depends of the requirements that the strategy is looking for. For example, in the case of the intraday trader may want a faster indicator rather than a long-term investor, because they would want to cut down a lag time to their short-term trading style. In this project it has been used three different groups of time periods to vary the strategies, choosing the ones that best adapt to each group.

MACD can be very useful if the market is not lateral, if it is moving continuously. In other cases it is better to use as a confirmation of the investment strategy.

2.3.3. Investment strategies.

Based on the values of the MACD, it is easier to understand better some things about trends. In which kind of trend is the stock or in which part of the trend it is. So, if it is possible a correct interpretation of these values, it would be easier to make a good investment decision and beat a simple strategy of buy and hold (SILV18).

Some of the assumptions that are taken to make investment strategies with the MACD are:

- If the fast line period is above of the slow line, it means that the stock is in a bullish period in general.
- When the MACD is above the line of zero, it means an uptrend period as well. In the other hand when the MACD is under the line of zero it deemed bearish trend.
- The larger the MACD Line value is, the greater the divergence. If it grows, it is deemed to show increasing momentum in that direction.
- Increasing momentum is shown as the value becomes more negative.

- If MACD Line crosses over the Signal Line, it uses to mean a positive turn in the market. While, crossing in the opposite direction would be deemed as a negative turn.
- Oscillations around 0 can be used for early indicators of turn in the market direction.

There are different rules to convert the value of the MACD into an investment strategy, which means, if it is recommended to buy, to sell or to remain expecting more clear movement in the market to act. Some of them are explained here:

- A buy signal is produced when MACD crosses zero from below, while a sell signal is obtained when MACD crosses zero from above. This trading rule is denoted as MACD (N, M, 0). Although this strategy could very slow and could cause that you would get into the trend too late, but it is easy to apply and can give very good results by modifying the length of the period and the line of the zero.
- A purchase signal is generated when the EMA of the MACD is smaller than zero and a sell recommendation is made when the nine-day EMA of the MACD is greater than zero.
- A buy signal is generated when MACD crosses the EMA of the MACD from below, while a sell signal is obtained when MACD crosses the EMA of the MACD from above. This trading rule is called as MACD (N, M, 1). It is a very visual way of trading and to create investment strategies looking the histogram, which shows the difference between the MACD and the signal line (EMA of MACD).

It is very useful the histogram, which allow us to see clearer the difference between the Signal Line and the MACD. If the MACD is greater than zero when the signal line and the MACD cross themselves, it means that the change in the trend is going to be sharper.

As it has been commented in the last strategy, it is very common to some investors the use of the histogram in the same way that they use to work with the MACD itself. In the histogram it can be easily identify positive and negative crossovers, divergences and the velocity of rises and falls. There is no one better than other, it depends on the situation, the difficulty is to know in which situation is better each of them, it requires a lot of knowledge and experience.

Moreover, there are more investment strategies based on combination of the three exposed.

Chong exposed an investment strategy that combines the value of the MACD (n) respect to zero and the value of the MACD (n-1) respect to 0 as well, so in this situation it is not taken into account the EMA of the MACD, but it is combining two different MACD, the actual and the previous one specifically, to look not only how is the trend in this moment if not if there is a change on it too, (CHON08). Then, there are shown two different scenarios:

- Purchase recommendation is produced when the MACD(n) is greater than zero and the value of MACD (n-1) is lower or equal to zero.
- Sell recommendation is generated when the MACD(n) is lower than zero and the MACD(n-1) is greater or equal than zero.

Rosillo explains the combination of parameters, which should be satisfied at the same time, so it is going to be more restrictive and more complicate to make a purchase or sell operation. This approach is recommended to investors that cannot minimize the operating cost or small investors that cannot afford maintain a big portfolio, in order to minimize the number of operations, just taking into real operations the safeties and the most profitable operations by minimizing risk operations and minimizing the cost of transactions. (ROSI12).

So, what R. Rosillo is proposing is just take an operation in the following scenarios:

- Purchase decision, when MACD is lower than 0, Sign is lower than 0 and Sign is greater than MACD.
- Sell recommendation, when MACD is greater than 0, Sign Line is greater than 0 and Sign is lower than MACD.

There are also other details that sometimes earn importance in the study of how strong is going to be the change in the trend that is coming. In these cases it could be useful look how faster the MACD is changing and not only if it is changing or not.

It is different when there is a MACD changing slowly that when this change happens very fast. In this last case, it can be associated the velocity to the oversold or overbought of a stock, so it means, that if the stock is in some of these situations would have to go back to the normal price soon.

But the MACD have also some limitations. There is a problem with the divergence because it could sign a possible reversal, but then any reversal actually happens, so it would produces a false positive. Moreover, divergence is not able to forecast all the signals that are done by reversals, it means, there are reversals that cannot be identify just with divergence.

As it has been told before, MACD is not the best indicator when the price moves sideways, in a range or in a triangle pattern following a trend, this is the situation when more of the “false positive” are made. MACD use to pull away from its prior extreme when a slowdown in the momentum happen, so MACD tend to the line of zero without a true reversal.

In this project is analyzed different strategies with the MACD focusing in the different between the MACD and the Signal Line, that is represent by the histogram. The three strategies analyzed represent the short, mid and long term and the period of days that are taken to the slow and fast period of each of the strategies are 13,21; 34,21 and 34,144, respectively. This strategy use to identify the buy sign when the histogram is greater than zero and the sell sign when it cross under zero, so an uptrend is identified with positive values and a downtrend is identified with negative values. However, in order to achieve greater performances and adapt the one that focus in the long term to the uptrend group of stocks, their barrier that identify the change of the trend has been moved up to 2 to just take really strong uptrend periods and prevent that because of the focusing in the long term, short and little but existent downtrend periods can cause bad results cause to the late discover of them. So the long term strategy is expected to adapt well to the uptrend group.

For similar reasons, the midterm barrier has been moved up until 1, to just identify a little stronger uptrends as normal ones and prevent the losses caused by the late discover of downtrends. This strategy is expected to make really good performances with the global portfolio.

Finally, the strategy that focus in the short term is expected get good results with the downtrend group of stock, because of his ability identifying shorts and quickly uptrends inside a bigger downtrend, with a fast determination of trends.

2.4. Performance.

One of the classic ways to measure the performance of an investment strategy and the buy and hold return taken by the MACD has evaluated them on the basis of ten day returns.

$$r_t^{10} = \log\ (P_{t+10}) - \log\ (P_t).$$

Moreover, there are other measures with which you can measures the performance of your strategy, some of them are:

Performance and annualized performance: this take the initial equity to measure how good or bad has been the net profit or loss that you have obtained at the end of the simulation. The performance annualized is the same, but multiplying the performance by 365 and then dividing by the number of days in the simulation. It is very useful to compare different performances because they do not use to have the same duration. It is very common to use it to compare volatility.

Buy and hold index: this compare your investment strategy with a buy and hold strategy performance. A positive or negative number do not mean that the strategy is good or bad just this strategy is simply better or worse than a simple buy and hold strategy. For example, a strategy that obtain a 5 % more profits than a buy and hold strategy would have an index equal to 5.

Profit and loss index: it is a comparison between the net profits to the quantity of winning or losing trades. The value of this index go from -100 to +100.

$$Profit\ and\ loss\ index = Net\ ProfitMax\ (Trade\ Profit, Trade\ Loss) * 100$$

A positive number, for example 75, means that the total profit has been a 75%, but a 25% of the profits has been lost. It means, an index of 100 does not mean that the price of the stock is the double if not that all the operations taking with this strategy has been positive, you have not lost anything of your profits. The same meaning but with loses have the negative values of the index. This method to measure the profitability is not the best but it could be good to compare some kind of volatility.

2.5. Difference between RSI and MACD.

The RSI is a technical indicator that identify when a stock is overbought and oversold and is calculated by measuring changes in price and this relation highs and lows, while the MACD identifies change in trends of the stock and is calculated by moving averages of different length periods. These technical indicators could be used to complement each other, getting more accurate information about the stock and the possible starts or ends of operation. (HAYE19).

However, they could identify different signs and give to the investor contrary indications, because the measure of the momentum that both of them are taken, measures different factors.

A good example to a better understand of this type of situation is that RSI value would be above 70, which is the standard value that determines the frontier to the overbought zone, while the MACD identifies a growing market in buying momentum. So, each of the indicators may signal a future trend change that is upcoming by showing divergence from the stock price.

It is not the motivation of the project but could be interesting to future applications and studies of the matter, about how to select the correct sign in case contradictory signs.

3. MATLAB´s App and genetic algorithm.

In this chapter are presented the main tools that has been used to the development of this project. These tools are a MATLAB´s App and an optimizer that is integrated in the App.

The App has been designed with the App Creator of MATLAB and has been developed by Juan Luis Zamora to make easier the process of evaluate, interpret and make investment decisions with the different strategies taken with a wide range of technical indicators.

The App has different functions that can be modified to get the specific details, which are being looked for, of each of the stock and of each of the strategies.

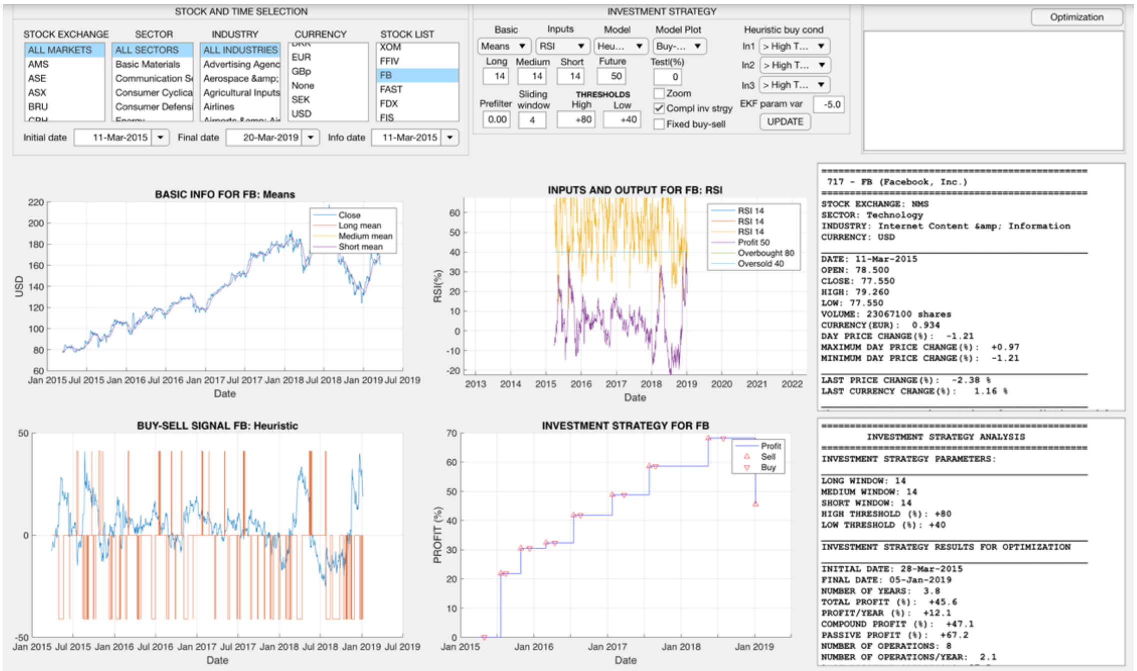


Figure 24: MATLAB´s App.

As it can be seen, the right top corner is dedicated to select the stock that is going to be analyzed, this selection is divided in currencies, stock markets, industries and companies. It also can be chosen the period where it is desire to apply the investment strategy. Then on the right, it is shown all the variables, from the technical indicators to the length of the period use to calculate the value of it, and the optimization in the right top corner.

The rest of the App is dedicated to show results of the strategy and information of the stock, where the right part are specific details about the company of the stock and a lot of data about the performance of the operations taken, while the left part is completely dedicated to graphs that are shown the signals of buy and sell, which of these signals convert into a real buy or sell position, an initial variable of the stock and the values that has taken the technical indicator.

Now, it is going to be presented the other tool that it has been used to the development of the project. It is a part of the MATLAB´s App that optimize the barriers and the period given to each of the stock in order to maximize the performance, it means, this function give you the most optimize parameters that determines barriers of oversold, overbought, uptrend or downtrend and the length of the periods used to calculate them, it has been developed by Marta Villagrán and Juan Luis Zamora.

This optimizer works with genetic algorithms. Genetic algorithms work very similar as the Darwin´s theory about humans, inside a population just the bests survive and then they reproduce getting a better new specie, this process is be done again and again until the specie is the best as possible. But, how is this apply to investment strategies?

In this case, the random population is chosen as a group of different parameters by MATLAB. Once, there is a first group, it is evaluated to rank the best performances. This evaluation is driven by a function that has been generated and that is taking into account the final profitability of the strategy and the numbers of continues positive operations made by the strategy, it means that it does not just focus on the whole profitability of the decision if not in the number of positive operations as well. Moreover, to this evaluation it could be chosen a strategy without any negative operation, but it is used to be very difficult to achieve and used to be faraway of be the best performance of the stock, so what it is used to use is the evaluator that weigh the positive continues operations.

Then, when the ranking is done, there are three different ways of selection:

- Elites: this type of selection just select the best 5% of the population to assure that the next population is going to evolve.
- Crossover: this selection is characterized because of the deep exploration in some interested zones, where the performances are really good, so best performances could be found.
- Mutation: this selection modify little changes in the population, in order to prevent the loss of diversity.

After the selection, it is created a new population by mixing the whole group selected, who is evaluated again to determine if the process should start again or if the optimization have ended successfully.

This last part that determines if the process has end or not, it is constrained by a maximum number of iterations, a very little change in the total performance of the group or a very little change in the best of the group.

The limits of the iterations to the RSI and to MACD has been indicated in (0,99) and (-5,5) respectively.

4. Performances obtained using technical indicators.

4.1. Performances with the RSI.

4.1.1. Uptrend stocks.

In this section it is exposed and commented the results obtained with different investment strategies, all of them based in the Relative Strength Index.

The group of stocks that has been analyzed share a common trend. In this case a bullish trend, so the investment strategies that best adapt to them are going to be the strategies with high values of the barriers of overbought and oversold.

The limits of oversold and overbought that can be shown by the RSI are going to move depend on the strategy that is used. These limits will point out the signs of buy and sale of each stock.

Usually, in a bullish trend both of the barriers of overbought and oversold go up to get better performances of the operations, as commented before. It is completely reasonably because when a stock is increasing its price and this rise has been experimented enough long during a period of time, the RSI is going to identify the tendency by taking higher values than usually.

Firstly, some techniques and investment strategies commented on the second chapter will be used. The major of them are going to be the most accurate to the kind of trend that we are working with, but there is also going to be some opposite investment strategies usually useful to other tendencies, just to check our assumptions are right and the strategies explained and commented in the second chapter give the expected results.

After these first tests, with most of the strategies collected in this project. New optimized strategies will shown the best performances that can be achieved with this group of stocks and strategies just based on the RSI. These strategies has been created by new intelligent genetic algorithms expecting a more optimum result with higher performance obtained, these new algorithms will improve meta parameters by a genetic code, as it is explained in the previous chapter.

These are the stocks that composed the uptrend group of stocks and that has been analyzed:

- **United Health Group (UNH):** is an American for-profit managed health care company based in Minnesota. It has a market capitalization of 234 B of US dollars and operates in the NYSE.

- **Abbot Laboratories (ABT):** is an American health care company based on Illinois. It has a market capitalization of 143 B of US dollars and operates in the NYSE.

- **Merk and Co (MRK):** is one of the largest pharmaceutical companies in the world. It has a capitalization of 214 B of US dollars and operates in the NYSE.

These three stocks have been studied during a five-year period, from the beginning of 2015 to February of this year.

The first strategy used, is the most famous strategy of the RSI, with the classic values of oversold and overbought in 30 and 70. It is recommended usually to any kind of trend because it is very general and can be adapted to any trend.

Buy 30. Sell 70.

	UNH	ABT	MRK
Total profit with dividends	69,33%	51,80%	46,20%
Compound profit without dividends	88,60%	38,70%	25,80%
Number of Operations	12	12	12
% of positive operations	91,7	66,7	75
Average operation duration (days)	34,8	43,2	49,8
Maximum profit	66,30%	36,10%	32,80%
Minimun profit	7,20%	-10,50%	3,40%
Volatility	4,22%	7,28%	6,97%

Figure 25: Results of the RSI strategy with barriers of oversold and overbought in 30 and 70.

The following strategies are focused in stocks with a bullish trend. The reasons of why these strategies are used during a bullish trend, and the differences between them has been commented in the second chapter, in the section of the RSI, investment strategies.

Buy 35. Sell 80.

	UNH	ABT	MRK
Total profit with dividends	103,78%	64,50%	54,42%
Compound profit without dividends	145,50%	53,40%	31,40%
Number of Operations	11	10	9
% of positive operations	100	70	66,7
Average operation duration (days)	65,1	71,2	77,8
Maximum profit	95,20%	46,40%	30,80%
Minimum profit	4,9	-12,40%	0,70%
Volatility	6,37%	7,86%	9,18%

Figure 26: Results of the RSI strategy with barriers of oversold and overbought in 35 and 80.

Buy 45. Sell 90.

	UNH	ABT	MRK
Total profit with dividends	115,20%	45,90%	66,97%
Compound profit without dividends	126,90%	47,00%	36,37%
Number of Operations	3	4	3
% of positive operations	100	50	100
Average operation duration (days)	323,3	228,5	330,7
Maximum profit	101,00%	45,90%	33,50%
Minimun profit	49,00%	-11,10%	3,20%
Volatility	27,26%	18,36%	12,31%

Figure 27: Results of the RSI strategy with barriers of oversold and overbought in 45 and 90..

Buy 55. Sell 85.

	UNH	ABT	MRK
Total profit with dividends	110,42%	61,67%	55,58%
Compound profit without dividends	128,40%	55,00%	30,20%
Number of Operations	5	10	6
% of positive operations	100	70	67
Average operation duration (days)	192,2	88,6	159,8
Maximum profit	96,00%	49,30%	34,60%
Minimun profit	16,00%	-9,70%	-11,70%
Volatility	21,59%	22,11%	21,04%

Figure 28: Results of the RSI strategy with barriers of oversold and overbought in 55 and 85.

Buy 25. Sell 80.

	UNH	ABT	MRK
Total profit with dividends	81.19%	65.16%	44.96%
Compound profit without dividends	114.7%	63.6%	24.2%
Number of Operations	9	8	8
% positive operations	100%	75%	75%
Average operation duration (days)	64.4	55.8	73.4
Maximum Profit	80.7%	52.3%	25.8%
Minimun profit	6%	0.4%	3.4%
Volatility	6.37%	7.86%	9.18%

Figure 29: Results of the RSI strategy with barriers of oversold and overbought in 25 and 80.

Now, it has been tested an investment strategy that is recommended for bearish trend to check if effectively the changes in the limits of the RSI that limited the zones of oversold and overbought that point out the signs of buy and sale when are crossed by the index, are significant in the performance of the strategy or if in the opposite case it does not affect at all to the profitability of the positions.

Buy 20. Sell 65.

	UNH	ABT	MRK
Total profit with dividends	42.4%	31.78%	36.17%
Compound profit without dividends	47.6%	27.9%	14.2%
Number of Operations	6	7	9
% positive operations	100%	71.4%	55.6%
Average operation duration (days)	21.3	28.1	38.2
Maximum Profit	40.6%	26%	20.9%
Minimun profit	11.4%	1.5%	4.1%
Volatility	3.29%	5.42%	8.15%

Figure 30: Results of the RSI strategy with barriers of oversold and overbought in 20 and 65.

BUY 10. SELL 50

	UNH	ABT	MRK
Total profit with dividends	12,80%	0,00%	6,10%
COMPOUND PROFIT without dividends (%):	12,8	0	6,1
NUMBER OF OPERATIONS:	1	0	1
% OF POSITIVE OPERATIONS:	100	0	100
AVERAGE OPERATION DURATION (days):	20	0	20
MAXIMUM PROFIT (%):	12,8	0	6,1
MINIMUM PROFIT (%):	12,8	0	6,1
Volatility	0,00%	0,00%	0,00%

Figure 31: Results of the RSI strategy with barriers of oversold and overbought in 10 and 50.

BUY 10. SELL 60

	UNH	ABT	MRK
Total profit with dividends	12,80%	0,00%	6,10%
COMPOUND PROFIT without dividends (%):	12,8	0	6,1
NUMBER OF OPERATIONS:	1	0	1
% OF POSITIVE OPERATIONS:	100	0	100
AVERAGE OPERATION DURATION (days):	20	0	20
MAXIMUM PROFIT (%):	12,8	0	6,1
MINIMUM PROFIT (%):	12,8	0	6,1
Volatility	0,00%	0,00%	0,00%

Figure 32: Results of the RSI strategy with barriers of oversold and overbought in 10 and 60.

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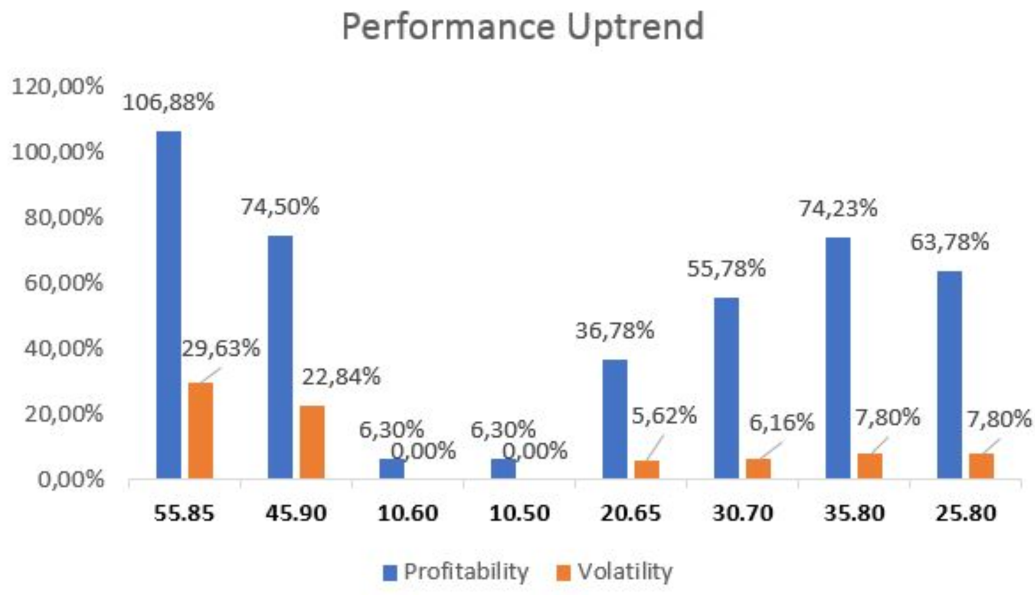

Figure 33: Global results of uptrend group of stock.

All the information with dates of the operations and more details are at the end as attached documents.

The results were expected, firstly the standard strategy has get a good result but cannot exploit all the potential of the bullish trend, because the barrier of overbought was a bit low standing at 70, when the stocks are rising fast. So, it means that the stock has been sold in the halfway and faraway of the maximum price of the bullish trend. The huge number of operations that have been taken with this strategy, have also another meaning, big transactions cost that have been affected to the final performance.

With each of the specific bullish trend investment strategies, is reflected how they are able to take most of the potential that the stocks had during this period.

The best performance have been reached with the strategy of buy at 55 and sell at 85. This strategy is characterized because it has very few and long operations, so it has a very few total cost of transaction and having a high value of the overbought barrier, at 85, it is assured that the stock is going to be sold at a very high price of the trend. It could be not as good as in other scenarios because it is a very difficult value to reach with the RSI, so operations are going to be usually longer than with other strategies, but how this group of stock are in the long run in a bullish period, it does not suppose a problem if the strategy is focus in a long term, if the strategy would be looking for profitability in the short run, it could be a problem because of the high volatility inside the operation that may experiment.

High volatility is observed as well, but it is because of a sharply rise of the stock price that have generated a profitability far bigger than the rest of operations. This generates a sharply increase in the cumulative profitability misadjusting this value with the rest, causing a high volatility of the performance.

In the other hand, if the bearish strategy applied is analyzed, it is observed how the performance is much lower than in the rest of the cases, serving as a good check of the theories of movement RSI barriers that have been explained before.

However, it is observed that this could be used as a very conservative strategy, because if it is taken attention to the volatility and the percentage of positive operations, these statistics are better with this strategy than with the rest by having a 100% of positive operations and volatilities that oscillate between 0% and 6%, which is considerably lower than with the rest of the strategies taken with this group, this is the consequence of very few operations that have bought stocks at a really good price of the moment and have sold them quickly, assuring a positive return most of the time and short operations, but without reach all the potential earnings and with very few possibilities of take advantage of the dividends distributed, because of the short period that the operation is active during the whole investment period.

4.1.2. Downtrend stocks.

Now in this section a different group of stocks has been analyzed as well as the other group before. This group of stocks has a completely different trend than the previous one, they have been in a bearish market during all the investment period.

It is very difficult to get good results in a bearish market, so the investment strategies based on the relative strength index are going to be used to try to minimize the falling of the prices and try to make profitable operations during the short bull moments that may pass the stock. These targets has been achieved by adjusting the barriers of oversold and overbought, in the same way that it were adjusted with the stocks that were involved in a bullish trend.

In this scenario, the adjustment is going to be a reduction of both of them, the overbought barrier, which use to identify and show the sign of sale, is going to be reduce to a lower value and the oversold barrier, which use to identify and show up the sign of buy, is going to be reduce too. The quantity of these reductions of the barriers will depend of the kind of strategy that have been chosen, in function of the target of the investment.

The meaning and the objective that are tried to get with each of the strategies is explained in the second chapter, with all the strategies followed by the RSI.

The stocks that has been treated with the different strategies are:

- **General Electric (GE):** is an American international conglomerate incorporated in New York and headquartered in Boston. It has a market capitalization of 89.65 B US dollars and operates in the NYSE.
- **Kraft Heinz Company (KHC):** an American food company formed by the merge of Kraft food and Heinz. It is based in Chicago and it has a 36.89 B of US dollars in capitalization. It operates in the NASDAQ.

As with the group before, it is going to be followed the same sequence of strategies. Beginning with the standard one of buy at 30 and sell at 70, following with the specifics strategies to a downtrend stock that has been recommended to these kind of stocks and with some strategies developed, and finally with a strategy recommended to the opposite trend.

BUY 30. SELL 70.

	GE	KRF
Total profit with dividends	-52,32%	-15,30%
Compound profit without dividends	-61,70%	30,20%
Number of Operations	11	6
% positive operations	27%	67%
Average operation duration (days)	61,8	159,8
Maximum Profit	15%	34,60%
Minimun profit	-80%	-11,70%
Volatility	20,31%	13.53%

Figure 34: Results of the RSI strategy with barriers of oversold and overbought in 30 and 70.

Buy 20. Sell 65.

	GE	KRF
Total profit with dividends	-15,35%	-28,65%
Compound profit without dividends	-25,60%	-39,80%
Number of Operations	11	6
% positive operations	46%	17%
Average operation duration (days)	38,3	49,3
Maximum Profit	17%	0,20%
Minimun profit	-25%	-45,90%
Volatility	11,40%	10,38%

Figure 35: Results of the RSI strategy with barriers of oversold and overbought in 20 and 65.

Buy 10. Sell 50.

	GE	KRF
Total profit with dividends	-11,94%	-8,65%
Compound profit without dividends	-15,50%	-17,10%
Number of Operations	3	4
% positive operations	33%	50%
Average operation duration (days)	24	34,2
Maximum Profit	2,9%	3,3%
Minimun profit	-15,2%	-22,0%
Volatility	8,3%	6,7%

Figure 36: Results of the RSI strategy with barriers of oversold and overbought in 10 and 50.

BUY 10. SELL 60.

	GE	KHC
Total profit with dividends	0,40%	-9,90%
Compound profit without dividends	-1,10%	-19,70%
Number of Operations	3	4
% of positive operations	66,7	50
Average operation duration (days)	48,5	48,5
Maximum profit	1,20%	1,20%
Minimun profit	0,40%	-25,10%
Volatility	0,95%	2,53%

Figure 37: Results of the RSI strategy with barriers of oversold and overbought in 10 and 60.

Buy 35. Sell 80.

	GE	KRF
Total profit with dividends	1,37%	-33,13%
Compound profit without dividends	-43,60%	-56,30%
Number of Operations	5	9
% positive operations	60%	44%
Average operation duration (days)	144,4	86,8
Maximum Profit	18,1%	23,6%
Minimun profit	-34,5%	-60,5%
Volatility	8,9%	16,1%

Figure 38: Results of the RSI strategy with barriers of oversold and overbought in 35 and 80.

BUY 55. SELL 85.

	GE	KHC
Total profit with dividends	-53,24%	-14,32%
COMPOUND PROFIT without dividends (%):	-63,7	-40,3
NUMBER OF OPERATIONS:	6	3
% OF POSITIVE OPERATIONS:	50	33,3
AVERAGE OPERATION DURATION (days):	161,2	285,7
MAXIMUM PROFIT (%):	29,5	18,5
MINIMUM PROFIT (%):	-63,8	-30,9
Volatility	33,00%	17,98%

Figure 39: Results of the RSI strategy with barriers of oversold and overbought in 55 and 85.

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BUY 45. SELL 90.

	GE	KHC
Total profit with dividends	-64,00%	-20,28%
COMPOUND PROFIT without dividends (%):	-64,8	-43,4
NUMBER OF OPERATIONS:	4	2
% OF POSITIVE OPERATIONS:	50	50
AVERAGE OPERATION DURATION (days):	230	432,5
MAXIMUM PROFIT (%):	30,2	14,7
MINIMUM PROFIT (%):	-63,9	-35,9
Volatility	45,68%	28,53%

Figure 40: Results of the RSI strategy with barriers of oversold and overbought in 45 and 90.

BUY 25. SELL 80.

	GE	KHC
Total profit with dividends	-61,02%	-10,33%
COMPOUND PROFIT without dividends (%):	-56,7	-28,4
NUMBER OF OPERATIONS:	17	19
% OF POSITIVE OPERATIONS:	47,1	42,1
AVERAGE OPERATION DURATION (days):	37,6	30,6
MAXIMUM PROFIT (%):	21,3	41
MINIMUM PROFIT (%):	-67,3	-25,7
Volatility	23,08%	17,82%

Figure 41: Results of the RSI strategy with barriers of oversold and overbought in 25 and 80.

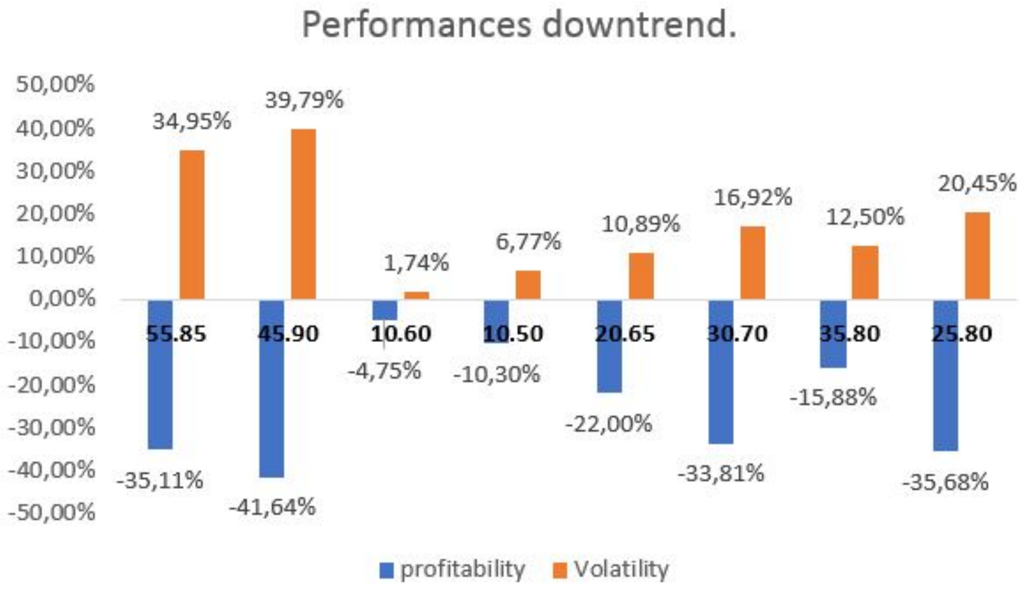

Figure 42: Global results of downtrend group of stocks.

These results have reaffirmed some assumptions made about investment strategies with stocks during a bearish period. However, there are some other results that have been unexpected, as the last result with General Electric stock, which has conducted more as stock in an uptrend rather than one in a downtrend.

It can happen in the stock market with some stocks in some periods because of a hundreds of external factors that are assuming to be recorded in the price but in certain occasions they are not. Anyway, it is necessary to see the group of stocks as a unit and see the conduct of the group as just one group and not as different stocks. It is exposed a good example of the importance of taking the most diversify as possible investment strategies, trying to avoid that an exception of the rule ruin the investment.

This random result has been the positive final performance of the General Electric stock after apply a strategy that have been recommended to bullish trend as buy in 35 and sell in 80 is. It is not completely incomprehensible because this strategy what have done is make few operations just when the stock price is changing the trend to a bullish one. However, what use to happen when this strategy is applied to a stock that is involved in a bearish trend is that the buy sign can be obtained in several occasions (although 35 is not a very good sign of oversold in a bearish trend), but the sale sign is very difficult to reach, because the relative strength index rarely moves into 80 in a stock that is in a long bearish trend, it is very unusual. What use to happen is that the sell operation does not take and the stock pass too much time in the operation, that usually is converted into loses because of long term downtrend period of the stock.

The other three strategies have obtained results very similar to the expected, with a worse performance of the two specific strategies to bearish trends. Particularly, General Electric have reacted very badly to the standard strategy by getting the worst result looked with this strategy.

In conclusion, if both stock are observed as unique group, as was commented before, the most conservative strategy (buy 10 and sell 50), has reached the best results in terms of profitability and volatility as well. It is the strategy that best adjust to a long bearish trend because it use to react with a buy sign just when the stock is really oversold. So, it is the strategy that less operations take and less loses get. However, it has been the best performance of all the strategies based on the RSI, just loses have been able to get, so there are a lot of margin to improve that is expected to achieve with the MACD.

4.1.3. Stocks with lateral movement.

In this section, it is going to be analyzed a group of stocks characterized by not have a clear trend if not having lateral movement. However, there is a group that show a bullish trend in most of the period and other group that use to be in a bearish one.

So, trying to optimize the investment strategies and adjust it the maximum as possible to the group of stock applied, all the group of stocks that has lateral movements has been divided into two groups, one with “bullish” lateral movement and other with “bearish” lateral movement.

This kind of stock that does not have a very clear trend use to have more difficulties to been analyzed, because just one strategy is being applied to a very long period of time, eliminating the possibility that can identify important changes in the trend that will give the chance of modify the strategy by adapting it to the most adequate in each moment.

Anyway, by dividing all the lateral movement stocks into two groups, there is a big performance in profitability and volatility that has been reached in the group as a whole.

Firstly the group of “bullish” lateral movement trend are going to be analyzed, expecting better results with similar techniques strategies that have obtained great performances with the stocks that are in a bullish trend trying to focus just in the strategies with a highest probability of success.

This first group is composed by:

- **Abb Vie Inc (ABBV):** is an American public pharmaceutical traded company founded in 2013 and based in Illinois. It has a market capitalization of 116 B US dollars and operates in the NYSE.
- **Mastercard Incorporated (MA):** is an American international financial services corporation headquartered in New York. It has a market capitalization of 264 B of US dollars and operates in the NYSE.

- **VISA Inc (V):** is an American multinational financial services corporation headquartered in California. It has a market capitalization of 372 B of US dollar and operates in the NYSE.
- **Facebook Inc (FB):** is an American social media and social networking services provider, headquartered in California. It has a market capitalization of 515 B of US dollars and operates in the NASDAQ.

Buy 30. Sell 70.

	FB	V	MA	AbbV
Total profit with dividends	46,90%	40,47%	28,64%	58,98%
Compound profit without dividends	49,20%	37,90%	28,20%	31,80%
Number of Operations	10	8	8	14
% positive operations	80%	63%	62,50%	64,30%
Average operation duration (days)	33,7	91,4	39,5	36,10%
Maximum Profit	49,2%	36,4%	26,70%	34,80%
Minimun profit	0,2%	-1,1%	-6,70%	12,40%
Volatility	11,2%	7,4%	6,07%	15,05%

Figure 43: Results of the RSI strategy with barriers of oversold and overbought in 30 and 70.

Buy 35. Sell 80.

	FB	V	MA	AbbV
Total profit with dividends	69,00%	68,89%	64,56%	62,32%
Compound profit without dividends	88,90%	85,30%	76,00%	27,60%
Number of Operations	9	9	8	10
% positive operations	78%	78%	75,00%	60,00%
Average operation duration (days)	72,7	68,4	61,1	81,20%
Maximum Profit	75,9%	66,1%	61,30%	50,50%
Minimun profit	22,1%	3,0%	3,60%	15,90%
Volatility	8,3%	7,5%	8,62%	7,24%

Figure 44: Results of the RSI strategy with barriers of oversold and overbought in 35 and 80.

BUY 55. SELL 85.

	FB	MA	V	ABBV
Total profit with dividends	90,20%	86,95%	80,96%	30,86%
Compound profit without dividends	118,40%	149,80%	101,00%	50,00%
Number of Operations	8	9	6	6
% of positive operations	75	100	83,3	66,7
Average operation duration (days)	113,6	102,3	156,7	157
Maximum profit	104,00%	96,90%	82,80%	28,80%
Minimun profit	30,60%	9,60%	18,00%	4%
Volatility	26,63%	26,27%	29,83%	14,21%

Figure 45: Results of the RSI strategy with barriers of oversold and overbought in 55 and 85.

BUY 45. SELL 90.

	FB	MA	V	ABBV
Total profit with dividends	108,00%	119,00%	103,89%	44,26%
COMPOUND PROFIT without dividends (%):	129,8	126,2	119,4	15,6
NUMBER OF OPERATIONS:	2	2	2	5
% OF POSITIVE OPERATIONS:	100	100	100	80
AVERAGE OPERATION DURATION (days):	502	502	500,5	187,2
MAXIMUM PROFIT (%):	108,4	108,4	100,6	38,8
MINIMUM PROFIT (%):	26	26	75,9	9,1
Volatility	58,27%	11,44%	18,80%	15,97%

Figure 46: Results of the RSI strategy with barriers of oversold and overbought in 45 and 90.

Buy 25. Sell 80.

	FB	V	MA	AbbV
Total profit with dividends	93,20%	43,11%	40,81%	51,72%
Compound profit without dividends	132,50%	47,10%	76,00%	17,60%
Number of Operations	7	4	8	8
% positive operations	86%	100%	75,00%	75,00%
Average operation duration (days)	52,9	76,2	61,1	81,2
Maximum Profit	96,8%	41,1%	61,30%	31,70%
Minimun profit	24,2%	18,6%	3,60%	-7,80%
Volatility	10,5%	5,6%	8,78%	6,41%

Figure 47: Results of the RSI strategy with barriers of oversold and overbought in 25 and 80.

Buy 20. Sell 65.

	FB	V	MA	AbbV
Total profit with dividends	44,70%	18,00%	29,50%	34,47%
Compound profit without dividends	52,60%	18,70%	76,00%	28,80%
Number of Operations	4	2	6	8
% positive operations	100%	100%	75,00%	100,00%
Average operation duration (days)	27	28,5	61,1	41,3
Maximum Profit	44,7%	18,0%	61,30%	26%
Minimun profit	10,1%	5,8%	3,60%	4,90%
Volatility	4,3%	3,2%	0,25%	4,48%

Figure 48: Results of the RSI strategy with barriers of oversold and overbought in 20 and 65.

BUY 50. SELL 50.

	FB	MA	V	ABBV
Total profit with dividends	54,10%	66,20%	67,30%	4,90%
COMPOUND PROFIT without dividends(%):	58,7	83,4	107,3	-4,8
NUMBER OF OPERATIONS:	30	32	33	31
% OF POSITIVE OPERATIONS:	63,3	71,9	75,8	48,4
AVERAGE OPERATION DURATION (days):	21,8	21	21,1	23,9
MAXIMUM PROFIT (%):	75,7	69,6	76,3	20,6
MINIMUM PROFIT (%):	2,5	0,5	9,5	-4,7
Volatility	22,22%	21,01%	21,10%	6,23%

Figure 49: Results of the RSI strategy with barriers of oversold and overbought in 50 and 50.

BUY 10. SELL 50.

	FB	MA	V	ABBV
Total profit with dividends	0,00%	0,00%	0,00%	-10,60%
COMPOUND PROFIT without dividends (%):	0	0	0	-11
NUMBER OF OPERATIONS:	0	0	0	2
% OF POSITIVE OPERATIONS:	0	0	0	50
AVERAGE OPERATION DURATION (days):	0	0	0	28,5
MAXIMUM PROFIT (%):	0	0	0	-10,6
MINIMUM PROFIT (%):	0	0	0	-11,1
Volatility	0,00%	0,00%	0,00%	0,35%

Figure 50: Results of the RSI strategy with barriers of oversold and overbought in 10 and 50.

BUY 10. SELL 60.

	FB	MA	V	ABBV
Total profit with dividends	0,00%	0,00%	0,00%	-10,60%
COMPOUND PROFIT without dividends (%):	0	0	0	-11
NUMBER OF OPERATIONS:	0	0	0	2
% OF POSITIVE OPERATIONS:	0	0	0	50
AVERAGE OPERATION DURATION (days):	0	0	0	28,5
MAXIMUM PROFIT (%):	0	0	0	-10,6
MINIMUM PROFIT (%):	0	0	0	-11,1
Volatility	0,00%	0,00%	0,00%	0,35%

Figure 51: Results of the RSI strategy with barriers of oversold and overbought in 10 and 60.

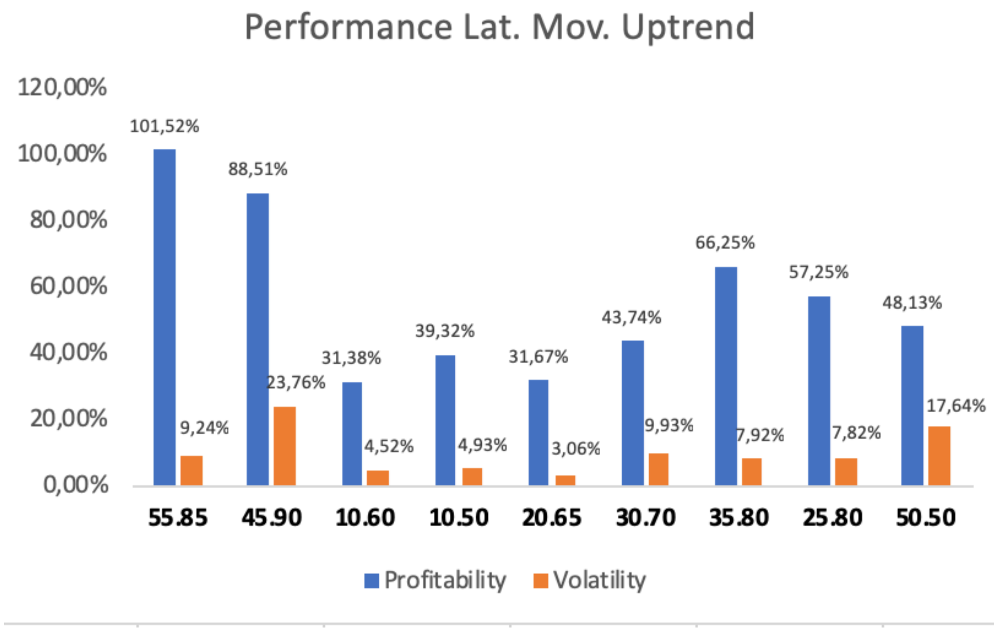

Figure 52: Global results of lateral movement uptrend stock´s group.

With this group, it is observed very similar behaviors than with bullish group. The strategy with the best performance has been, the one that puts the barriers of buy and sale in 35 and 80 respectively. It has been the most profitable strategy and also have had a low volatility. The volatility has been one of the main difference with this group and with the bullish one, in this case the "bullish" lateral movement group of stock has obtained a considerably lower volatility than the bullish one if it is compared with the most profitable strategy of each of these groups. However, if it is looked the same strategy in each group, volatilities are very similar.

As in the rest of scenarios, the less risk strategy has been the one with the lowest barrier of buy, it means, the strategy that give the order of buy in a most "oversold" zone. In this case, this barrier has been in 20 and have made a 100% of positive operations in the 75% of the stocks of the group and a 75% of positive operations in the rest, it has achieved the lowest volatility as a group an individually in each of the stock.

Now the group of "bearish" lateral movement is going to be analyzed following the same structure that has been followed with the last group, just with the difference that this group will follow strategies more similar to the bearish trend one.

The stocks that composed this group are:

- **Enagas SA (ENG):** is a company dedicated to gas transportation and manage the gas system in Spain. It has a market capitalization of 6 B of euros and operates in the BCE.

- **Zardoya OTIS (ZOT):** this company manufactures, installs and services elevators and elevator equipment. It has a market capitalization of 3,17 B of euros and is headquartered in Spain.

Buy 30. Sell 70.

	ENG	ZOT
Total profit with dividends	12,29%	-4,98%
Compound profit without dividends	-6,90%	-27,50%
Number of Operations	12	12
% positive operations	50%	50%
Average operation duration (days)	52,6	57,1
Maximum Profit	11,2%	4,7%
Minimun profit	-9,6%	-26,2%
Volatility	6,8%	7,5%

Figure 53: Results of the RSI strategy with barriers of oversold and overbought in 30 and 70.

Buy 20. Sell 65.

	ENG	ZOT
Total profit with dividends	12,50%	-14,93%
Compound profit without dividends	6,40%	-17,60%
Number of Operations	6	9
% positive operations	83%	56%
Average operation duration (days)	29,2	31,4
Maximum Profit	18,5%	0,7%
Minimun profit	2,1%	-17,7%
Volatility	6,2%	5,3%

Figure 54: Results of the RSI strategy with barriers of oversold and overbought in 20 and 65.

BUY 10. SELL 50.

	ENG	ZOT
Total profit with dividends	9,90%	0,50%
COMPOUND PROFIT without dividends (%):	10,20%	-0,60%
NUMBER OF OPERATIONS:	3	3
% OF POSITIVE OPERATIONS:	100	33,3
AVERAGE OPERATION DURATION (days):	20,33	20
MAXIMUM PROFIT (%):	9,9	11,1
MINIMUM PROFIT (%):	4,7	0,5
Volatility	2,61%	5,59%

Figure 55: Results of the RSI strategy with barriers of oversold and overbought in 10 and 50.

Buy 10. Sell 60.

	ENG	ZOT
Total profit with dividends	11,90%	6,27%
Compound profit without dividends	12,40%	2,40%
Number of Operations	3	3
% positive operations	100%	67%
Average operation duration (days)	21	20,3
Maximum Profit	11,9%	11,8%
Minimun profit	4,7%	3,3%
Volatility	0,7%	8,0%

Figure 56: Results of the RSI strategy with barriers of oversold and overbought in 110 and 60.

BUY 25. SELL 80.

	ENG	ZOT
Total profit with dividends	-10,62%	-14,10%
COMPOUND PROFIT without dividends (%):	-16,80%	-18,90%
NUMBER OF OPERATIONS:	23	21
% OF POSITIVE OPERATIONS:	47,8	61,9
AVERAGE OPERATION DURATION (days):	20,6	26,5
MAXIMUM PROFIT (%):	8,1	17,5
MINIMUM PROFIT (%):	-19,7	-14,2
Volatility	7,22%	6,98%

Figure 57: Results of the RSI strategy with barriers of oversold and overbought in 25 and 80.

BUY 50. SELL 50.

	ENG	ZOT
Total profit with dividends	-29,60%	-65,20%
COMPOUND PROFIT without dividends(%):	-28,5	-52,3
NUMBER OF OPERATIONS:	29	30
% OF POSITIVE OPERATIONS:	48,3	36,7
AVERAGE OPERATION DURATION (days):	24,7	24,9
MAXIMUM PROFIT (%):	5,1	10,9
MINIMUM PROFIT (%):	-30,4	-71,1
Volatility	12,22	19,45

Figure 58: Results of the RSI strategy with barriers of oversold and overbought in 50 and 50.

Buy 35. Sell 80.

	ENG	ZOT
Total profit with dividends	0,31%	-10,76%
Compound profit without dividends	-16,50%	-32,50%
Number of Operations	8	8
% positive operations	25%	38%
Average operation duration (days)	101	104,8
Maximum Profit	4,3%	12,9%
Minimun profit	-17,3%	-32,1%
Volatility	5,5%	9,1%

Figure 59: Results of the RSI strategy with barriers of oversold and overbought in 35 and 80.

BUY 55. SELL 85.

	ENG	ZOT
Total profit with dividends	20,95%	-27,61%
COMPOUND PROFIT without dividends (%):	-4,2	-35,1
NUMBER OF OPERATIONS:	4	7
% OF POSITIVE OPERATIONS:	25	131
AVERAGE OPERATION DURATION (days):	246,5	28,6
MAXIMUM PROFIT (%):	-0,2	15,6
MINIMUM PROFIT (%):	-8,8	-38,2
Volatility	10,49%	14,94%

Figure 60: Results of the RSI strategy with barriers of oversold and overbought in 55 and 85.

BUY 45. SELL 90.

	ENG	ZOT
Total profit with dividends	16,37%	-19,93%
COMPOUND PROFIT without dividends	-7,50%	-39,80%
NUMBER OF OPERATIONS:	2	3
% OF POSITIVE OPERATIONS:	0	0
AVERAGE OPERATION DURATION (day	500	325,7
MAXIMUM PROFIT (%):	-0,3	-7,3
MINIMUM PROFIT (%):	-7,5	-35,6
Volatility	8,18%	8,05%

Figure 61: Results of the RSI strategy with barriers of oversold and overbought in 45 and 90.

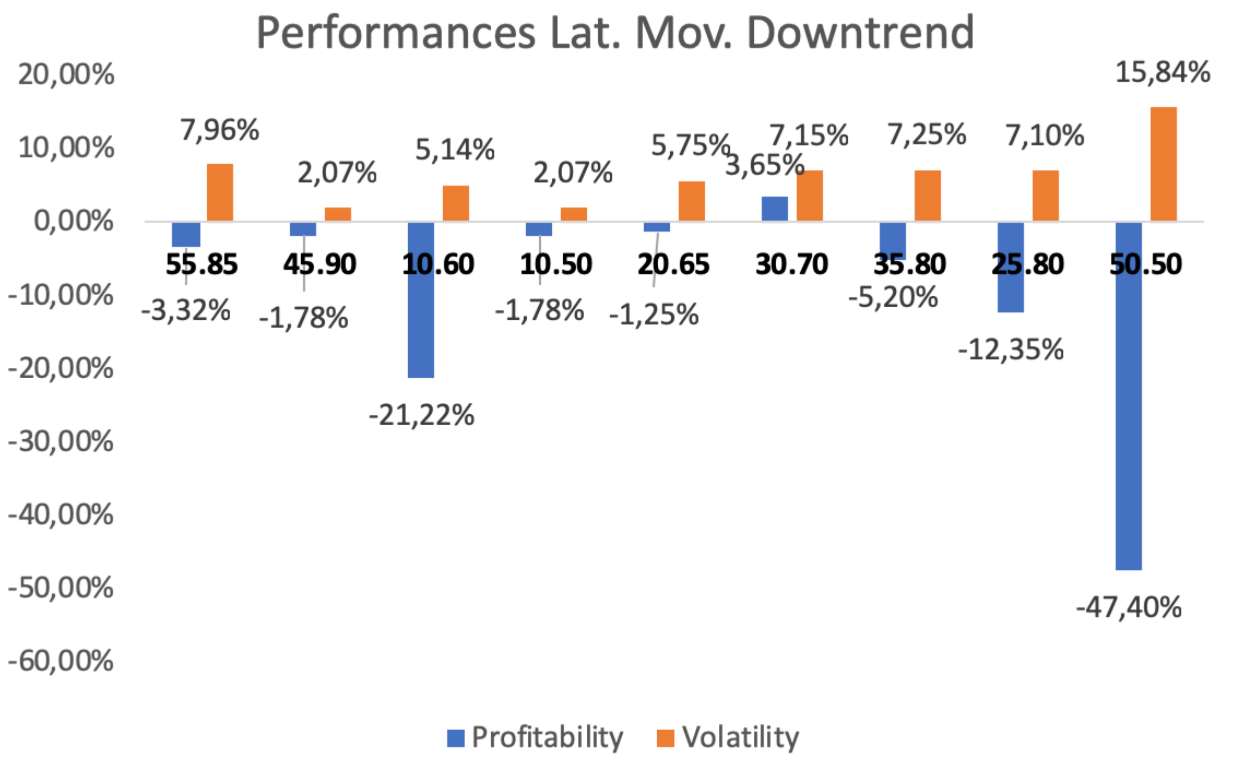

Figure 62: Global results of lateral movement stock´s group.

As expected, with a group of stocks that follow a bearish trend in most of the investment period, in this case denominated "bearish" lateral movement group, the best performance has been achieved by the strategy most conservative and with lowest barrier of buy, as explained before the one that give the buy order when it is crossed by the value of the RSI. So, the strategy with buy and sell signs in 10 and 60 has achieved both the lowest volatility and has been the most profitable, by getting a 9.085% of profitability as a group and 4.35% of average volatility.

It is shown, how this strategy is the one with the smallest average operation duration and it is what it was looking for because during a bearish trend you cannot look for a long profitable operation because you are in a bearish trend and as longer as you maintain your operation, more probabilities of make an unprofitable operation are going to exist, so what it is looking for is to make short operations that are able to take small bullish trends inside the bearish trend. In the other hand in the scenarios where a group of stocks that follow a bullish trend is analyzed, it is happening the opposite, the strategies with longer duration of the operations use to be the most profitable because are able to exploit all the potential of the trend.

4.1.4. Global portfolio.

In this last section of the chapter that analyze performances with the RSI, the strategies has been applied to the whole group of stocks, without differentiating them because of the trend that follow, trying to evaluated the strategies in a most real environment where the trend that has been followed by the whole group of stocks is random.

It has tried to get a competitive and diversify portfolio that just follow investment strategies taken by the evaluation with the RSI, being able of beat the inflation and the performances of other institutions that dedicated a lot of time and a lot of qualified analysts and managers to make their portfolios, as hedge funds or asset management firms.

The following table and graphs show the performance of the whole portfolio with different strategies based on the RSI, being all of them divide by years.

	2015	2016	2017	2018	Total	Volatility
30-70	10,13%	10,60%	2,68%	3,37%	26,78%	4,25%
35-80	10,18%	10,63%	13,70%	10,55%	45,05%	1,64%
20-65	8,75%	4,48%	0,72%	5,57%	19,52%	3,31%

Figure 63: RSI performances with the whole portfolio.

	2015	2016	2017	2018	Total	Volatility
55.85	18,60%	16,10%	10,44%	3,31%	48,46%	6,79%
45.90	3,99%	10,19%	10,11%	17,33%	41,62%	5,45%
20.85	10,65%	6,80%	7,89%	4,14%	29,48%	2,69%

Figure 64: RSI performances with the whole portfolio.

	2015	2016	2017	2018	Total	Volatility
10.60	5,09%	2,15%	0,93%	3,54%	11,70%	1,79%
10.50	-2,63%	5,72%	0,97%	6,05%	10,10%	4,15%

Figure 65: RSI performances with the whole portfolio.

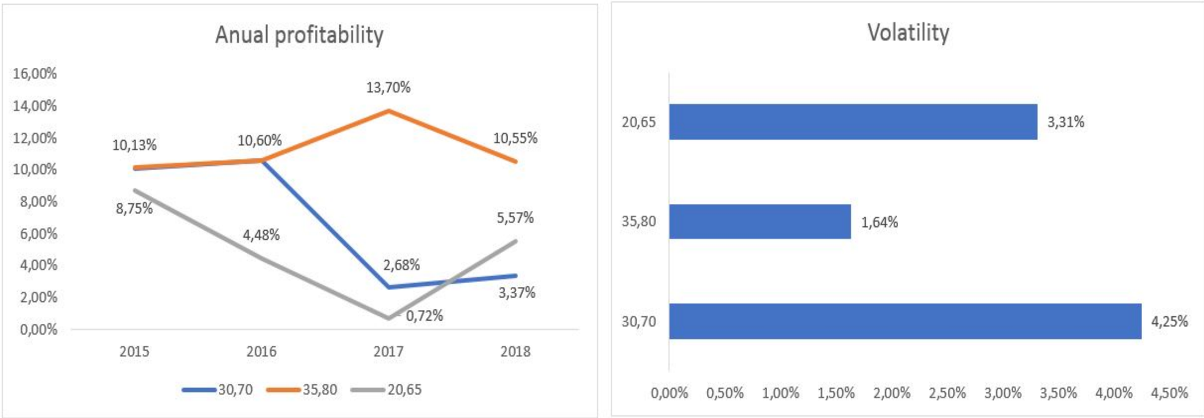

Figure 66: RSI performances with the whole portfolio year by year.

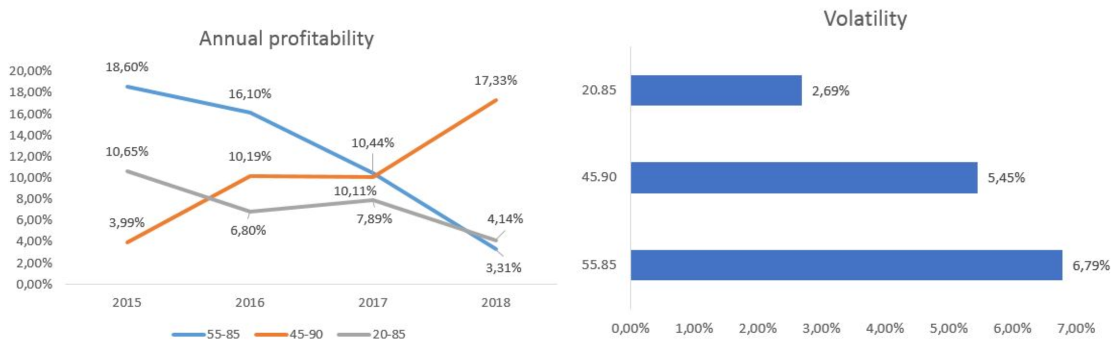

Figure 67: RSI performances with the whole portfolio year by year.

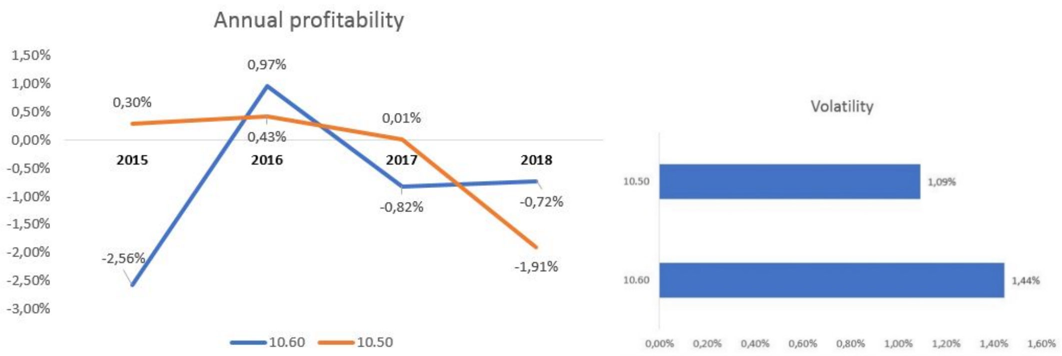

Figure 68: RSI performances with the whole portfolio year by year.

These results can show the potential that has a simple technical indicator as the RSI that with just some basics strategies applied in the same way during a period of four year and two months have made incredible results in profitability and in volatility terms. The truth is that it is very difficult to obtain a good and stable performance in the long run and these strategies have achieved it.

In the long run, there are a lot of factors that have taken into account and a very deep and long valuation of a company must be done to invest in a stock with a high probability of success. So, to see as good or as bad have resulted these strategies, they should be compared with some index during this period and with some investment firms during this period as well.

If the strategy with the best performance that has obtained around an 12% annualized, it is compared with the inflation rate that has had a 2% in Spain or around 2.5% worldwide during this period, it can be said that the money invested has beaten the simple devaluation of the money. Further, than the inflation rate many investment firms has obtained worse results during this period, for example, Cobas Asset Management the firm of Francisco García Paramés, which is considered the Warren Buffet of Spain, has achieved negative annualized performances in the last two years (Cobas International, Cobas Iberia, Cobas grandes compañías, etc) or the Santander in his fund of Santander Acciones Españolas that just operates with equity securities of the Spanish market, has achieved just a 1.95% of annualized profits in the last 5 years. So, as it can be appreciated the performance that have been obtained with this strategy just taking into account values of the relative strength index has made very good results.

	Average annual profitability	Volatility	68% of probability		95% of probability		99% of probability	
			Low	High	Low	High	Low	High
55.85	12,12%	6,79%	5,33%	18,91%	-1,47%	25,70%	-8,26%	32,49%
35.80	11,26%	1,64%	9,62%	12,90%	7,98%	14,54%	6,34%	16,18%
30.70	6,70%	4,25%	2,45%	10,95%	-1,81%	15,20%	-6,06%	19,45%
20.65	0,49%	3,31%	-2,82%	3,80%	-6,13%	7,11%	-9,44%	10,42%
45.90	10,41%	5,45%	4,96%	15,86%	-0,50%	21,31%	-5,95%	26,76%
20.85	7,37%	2,69%	4,68%	10,06%	1,99%	12,75%	-0,70%	15,44%
10.60	1,06%	1,79%	-0,73%	2,85%	-2,52%	4,64%	-4,31%	6,43%
10.50	10,10%	4,15%	5,95%	14,25%	1,80%	18,40%	-2,35%	22,55%

Figure 69: Ranges of performances with different approximate probabilities.

This strategy has had a relative high volatility during these years, a 6,79%. This measure could cause certain instability and insecurity to the investor. If this result is analyzed deeply as it is in the table, with an approach that supposed that annualized performances follow a normal distribution which is not and this imply that the volatility would have a bigger impact that with this assumption, making negative results with less percentage of probability. However, it can show the importance of the volatility and an estimation to quickly identify the best performances. It is found that could make negative annual returns in some years, although this probability is low, it is possible. It could be proposed other strategy as the followed by the barriers of 35 and 80 that it has achieved really high annualized profitability, very near to the 12% and also it gives to you a probability of nearly the 100% that a positive return is going to be obtained each year. It is a bit relative because the study is just taking 4 years, where any big crisis has been produced and there have not been very strange circumstances that could be in the market certain years. In the stock market, it is not possible to assure this low risk with high probabilities.

4.2. Performances with the MACD.

In this section, it is analyzed the same group of stock, which has been tested and analyzed with investment strategies based on the RSI, but now it is going to be invested by investment strategies supported on the technical analysis with the Moving Average Convergence and Divergence (MACD).

The investment strategies that have been followed to treat the different groups of stock change in the duration of them periods and in the barriers that identify changes to uptrend and to downtrend periods, in the second chapter are explained with all the details.

To this chapter, where it is going to be analyzed the MACD strategies with the improvement that have been made on them, it has been decided to divide all the stocks in just two groups, because the characteristics of the "bullish" lateral movement and the bullish group are very similar and are managed with the same strategies, as well as the bearish and the "bearish" lateral movement groups of stock.

4.2.1. Uptrend stocks.

To this section, as it has mentioned all the stocks with a bullish trend are analyzed, including both groups analyzed with the RSI with this trend.

As, it has been showed with the RSI this kind of stock use to move up the barriers of oversold and overbought that generate the sign of buy and sale when are crossed, something similar is going to be applied with the MACD.

In this case, as the MACD is an indicator of the change in trend, what it is expected is that uptrend stocks are going to need higher values of the change into a bullish trend that represent and can generate a sign of buy. In the same way the sale sign that will be generate by a cross of a barrier that identify a reverse change into a bearish trend, it is going to need to achieve a less position that means a change into a downtrend period, to be a sale sign with a group of uptrend stocks, it is important to understand that a less position of the barrier that identify a change into a downtrend it is traduced into a higher value of the frontier, it could seem a little ambiguous.

The stocks that have been analyzed are:

- **Abb Vie Inc (ABBV):** is an American publicly pharmaceutical traded company founded in 2013 and based in Illinois. It has a market capitalization of 116 B US dollars and operates in the NYSE.

- **Mastercard Incorporated (MA):** is an American international financial services corporation headquartered in New York. It has a market capitalization of 264 B of US dollars and operates in the NYSE.
- **VISA Inc (V):** is an American multinational financial services corporation headquartered in California. It has a market capitalization of 372 B of US dollar and operates in the NYSE.
- **Facebook Inc (FB):** is an American social media and social networking services provider, headquartered in California. It has a market capitalization of 515 B of US dollars and operates in the NASDAQ.
- **United Health Group (UNH):** is an American for-profit managed health care company based in Minnesota. It has a market capitalization of 234 B of US dollars and operates in the NYSE.
- **Abbot Laboratories (ABT):** is an American health care company based on Illinois. It has a market capitalization of 143 B of US dollars and operates in the NYSE.
- **Merk and Co (MRK):** is one of the largest pharmaceutical companies in the world. It has a capitalization of 214 B of US dollars and operates in the NYSE.

Short term Taking periods of 21,13, 1 and putting the barriers of buy and sell in 0.

	ABT	ABBV	FB	MA	V	MRK	UNH
Profitability	0,70%	46,66%	29,70%	20,65%	53,74%	28,72%	72,49%
Volatility	12,60%	22,53%	19,40%	11,07%	15,29%	9,63%	24,93%

Average Profitability	36,09%
Average volatility	16,49%

Medium term Taking periods of 34,21,1 and putting the barriers of buy and sell in 1.

	ABT	ABBV	FB	MA	V	MRK	UNH
Profitability	65,17%	35,46%	72,50%	83,83%	90,89%	63,42%	70,26%
Volatility	21,69%	15,64%	7,64%	30,64%	28,50%	19,89%	26,49%

Average Profitability	68,79%
Average volatility	21,50%

Long term Taking periods of 144,34,1 and putting the barriers of buy and sell in 2.

	ABT	ABBV	FB	MA	V	MRK	UNH
Profitability	34,45%	35,46%	31,00%	51,44%	58,17%	59,69%	67,42%
Volatility	14,41%	15,64%	15,96%	18,08%	21,01%	44,16%	27,96%

Average Profitability	48,23%
Average volatility	22,46%

Figure 70: Performances obtained with strategies based on the MACD with uptrend group of stock.

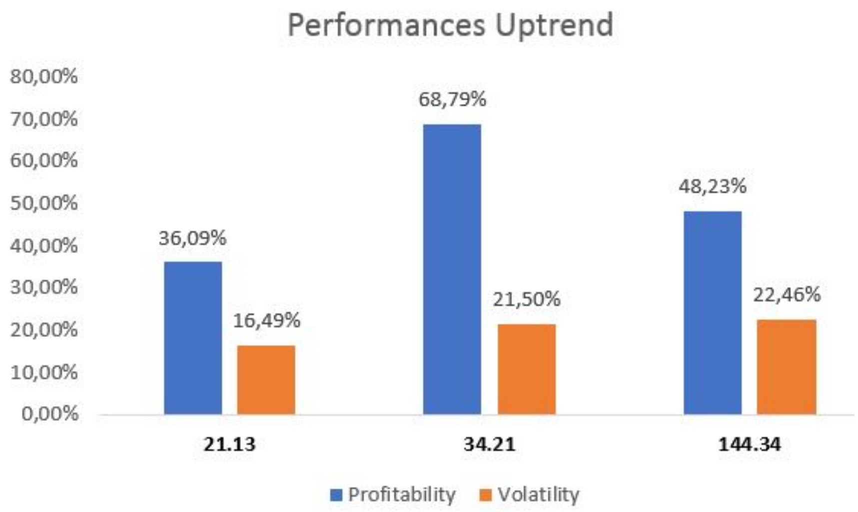

Figure 60: Global results of the uptrend group with MACD strategies.

After being analyzed the group of uptrend stocks with the three different, in time of the periods taken and in values of the barriers, investment strategies. It has been achieved best results with longer strategies as expected, although the best performance, measuring both profitability and volatility, has not been made by the longest one if not with the medium range length.

The strategy that takes long periods, it has been punished because of the small number of operations that have been done, this operation has not had a long average duration so has not been able to take all the potential of the bullish trend. In some stocks, these few operations also have been punished by the few dividends that has been able to get because of the few time that have been in position.

In the other hand the short periods investment strategies has realized too much operations, around the triple or more than the rest of the strategies, which means that has held with big charges in operations that have minimized the profits of the whole strategy. Moreover, it has not been the best if the percentage of average positive operations is looked. All these facts have directed this strategy to get the poorest performance, looking the profitability. The volatility has been lower than the rest but it is not low enough to cover the difference regarding the profitability with the rest.

Finally, the best performances has been achieved with the medium periods investment strategy that has taken most of the potential of the bullish trends with a good number of operations, it has been between the numbers of operations carried by the other strategies, Visa, Facebook and MasterCard has been the three stocks with a highest performance with this strategy and the ones that have been proven to make a difference in terms of profitability.

4.2.2. Downtrend stocks.

In this section are analyzed the investment strategies with the MACD in the other group of stocks. As with the uptrend stocks, the downtrend group of stocks and the “bearish” lateral movement group are going to join in just one group because of the similar characteristics that they have to the responses with the MACD.

With this downtrend group has been applied the same investment strategies that it has been used with the uptrend group. However, in this case different performances are expected with each of the strategies. With the long periods investment strategy is expected to achieve the worst results, because of the few abilities that this strategy has to identify the short and few mini uptrend periods that these stocks can have during the long period downtrend that are involved.

In the other hand, the short run investment strategy is going to be used to be able to identify these few uptrends and make very good performances, always taking into account the difficult work of get positive results when a stock is in a bearish trend.

The stocks that are going to be analyzed are:

- **Enagas SA (ENG):** is a company dedicated to gas transportation and manage the gas system in Spain. It has a market capitalization of 6 B of euros and operates in the BCE.
- **Zardoya OTIS (ZOT):** this company manufactures, installs and services elevators and elevator equipment. It has a market capitalization of 3,17 B of euros and is headquartered in Spain.
- **General Electric (GE):** is an American international conglomerate incorporated in New York and headquartered in Boston. It has a market capitalization of 89.65 B US dollars and operates in the NYSE.**Kraft Heinz Company (KHC):** an American food company formed by the merge of Kraft food and Heinz. It is based in Chicago and it has a 36.89 B of US dollars in capitalization. It operates in the NASDAQ.

Short term Taking periods of 21,13, 1 and putting the barriers of buy and sell in 0.

	KHC	ZOT	ENG	GE
Profitability	-74,95%	24,20%	-3,23%	4,58%
Volatility	16,20%	6,24%	4,99%	22,66%

Average Profitability	-12,35%
Average volatility	12,52%

Medium term Taking periods of 34,21,1 and putting the barriers of buy and sell in 1.

	KHC	ZOT	ENG	GE
Profitability	-32,45%	9,86%	-2,70%	27,41%
Volatility	10,26%	5,85%	5,65%	8,38%

Average Profitability	0,53%
Average volatility	7,54%

Long term Taking periods of 144,34,1 and putting the barriers of buy and sell in 2.

	KHC	ZOT	ENG	GE
Profitability	8,67%	-4,89%	-5,42%	-41,12%
Volatility	7,20%	5,91%	3,83%	15,85%

Average Profitability	-10,69%
Average volatility	8,20%

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Figure 71: Performances obtained with strategies based on the MACD with downtrend group of stock.

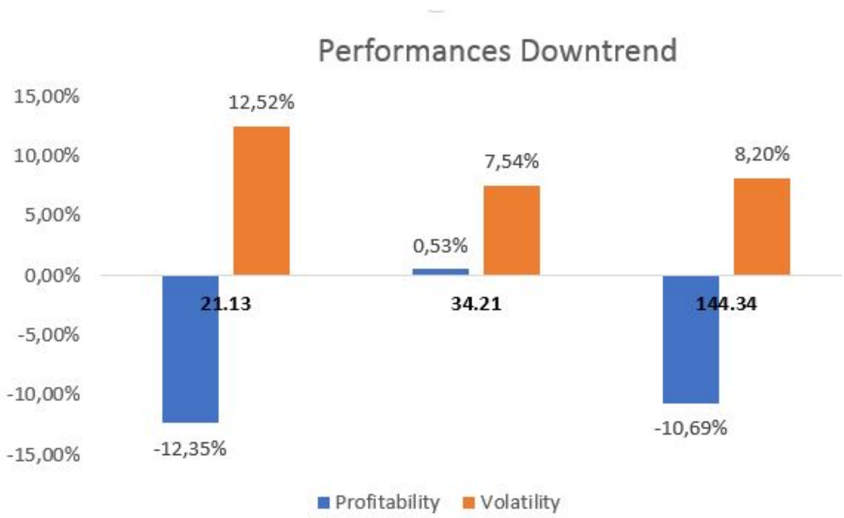

Figure 72: Global results of the downtrend group with MACD strategies.

It has been obtained results very similar to the expected, the short term strategy has get good results in general with Kraft Heinz Company as the exception. Unexpectedly this stock has achieved a very bad performance, with a very low rate of positive operations (it is showed in the attached documents, with all the information about the operations taken with this stock), ending with a catastrophic last operation between January and February of this year, as it is going to be commented in the chapter that relates bad or good operation with news that affected the company and if technical indicators can identify them, this fall of the price of the stock was because of the report of the results of the company during 2018, the strategy taken with the MACD was not able to identify it and make an operation with a loss of the 31%. The volatility obtained with this strategy has been the worst as well, but it is because the strange performances get with Kraft and a very good result achieved in the last operation with General Electric has changed a lot the volatilities of these two stocks affecting the whole volatility of the portfolio.

The best performance has been achieved with the medium term strategy again, it is probably not only for the duration of the periods if not for the barriers at 1, which are able to identify the change into an uptrend period, have been the values that have adapted better to these stocks. It has got the only strategy that has been able to get a positive profitability with a downtrend group of stocks and has get the lowest volatility as well.

It is curious that Kraft has get a positive performance with the long run strategy, which means that this stock has followed a behavior very similar to the stocks that are in a bullish mode.

4.2.3. Global portfolio.

In this section are going to join both group of stocks (uptrend and downtrend) and are going to be analyzed as a global portfolio.

In this scenario, the midterm period strategy is expected to adapt better to the whole group, being the intermediate between the one makes to adapt better to bullish group of stocks and the other to the bearish group of stocks and looking the results obtained with both groups it is going to be clearly the winner strategy.

	2015	2016	2017	2018	Total	Volatility
13,21	2,12%	-0,01%	9,40%	10,58%	22,09%	5,25%
21,34	8,85%	4,02%	20,50%	18,00%	51,36%	7,73%
34,144	-1,16%	5,11%	11,68%	8,95%	24,57%	5,57%

Figure 62: Global annual results with the whole portfolio following strategies based on the RSI.

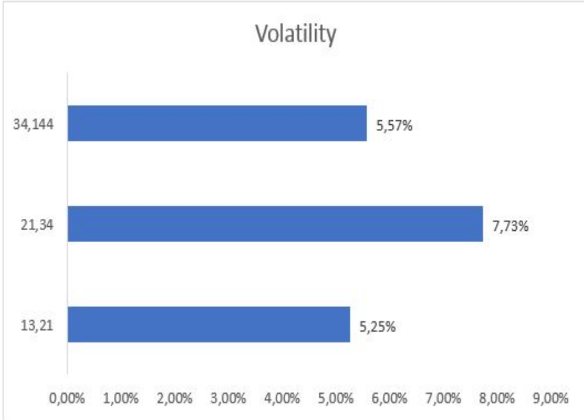

Figure 73: Global annual results with the whole portfolio following strategies based on the MACD.

To this global portfolio the strategy that takes medium term periods has been the one that have adapted better by achieving the best performances, it could be intuiting after seeing the results obtained with the groups of stocks separately, where this strategy got the best performance to both groups.

The results are similar than with the RSI, so it means that MACD has been useful and profitable as well, the volatility is a bit higher in this case but as it can be observed in the graph, every year has obtained positive returns, which means that this volatility in any moment has meant a risk to the investor, although it could be because of the volatilities.

The total performance is very grateful and means that the strategies taken of the standard recommendations of use of this indicator and the modification that have been realized to optimize them have worked correctly.

	Average annual profitability	Volatility	68% of probability		95% of probability		99% of probability	
			Low	High	Low	High	Low	High
13-21	5,52%	5,25%	0,27%	10,77%	-4,98%	16,02%	-10,23%	21,27%
23-34	12,84%	7,73%	5,11%	20,57%	-2,62%	28,30%	-10,35%	36,03%
34-144	6,14%	5,57%	0,57%	11,71%	-5,00%	17,28%	-10,57%	22,85%

Figure 74: Ranges of performances with different approximate probabilities.

In this scenario, it has not been possible to develop a strategy that can simulate a non-negative result with a very high probability if the annualized performance followed a normal distribution. However, the strategy with 23 and 34 duration of the periods has achieved a really good performance as it is shown in the table.

4.3. Performance of the combination between the RSI and the MACD.

In this section, it has been developed a global portfolio by giving to each stock the investment strategy that best adapt to it. These investment strategies are not going to be just for the RSI or for the MACD, in this section all strategies are compared to each stock, in order to can make the best portfolio as possible.

The performance achieved has been compared with the best performances get with strategies based just on the RSI or the MACD. These are the results:

	2015	2016	2017	2018	Total	Volatility
Combined	14,70%	6,55%	20,44%	22,90%	64,60%	6,29%
21,34	8,85%	4,02%	20,50%	18,00%	51,36%	7,73%
35-80	10,18%	10,63%	13,70%	10,55%	45,06%	1,64%

Figure 75. Global annual results with the whole portfolio following strategies based on the RSI and MACD.

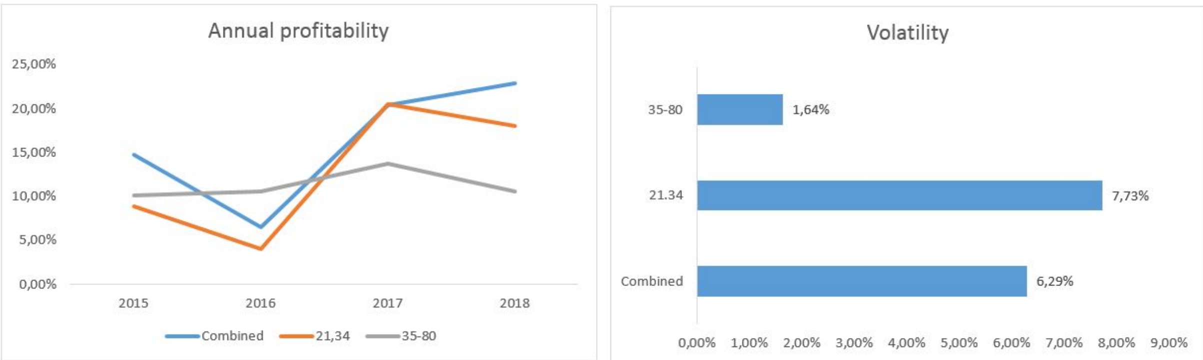

Figure 76. Global annual results with the whole portfolio following strategies based on the RSI and MACD.

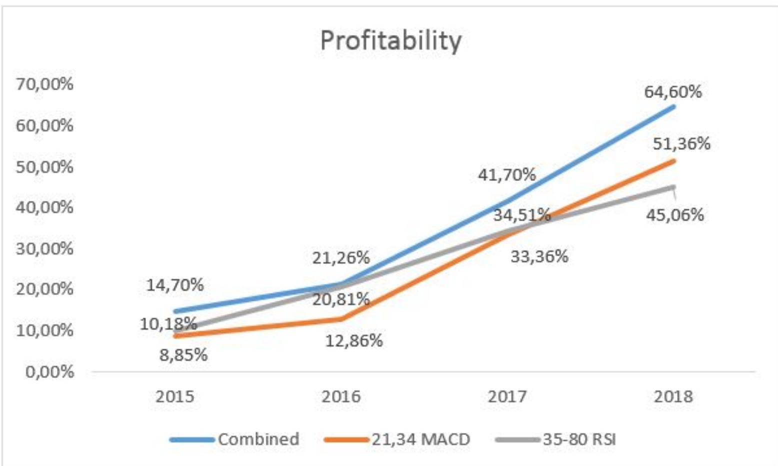

Figure 77. Global and cumulative results with the whole portfolio following strategies based on the RSI and MACD.

As it is shown in the graphs the profitability of the mix strategy is around a 15% better, this improvement is more remarkable the last two year, when the performance has a grateful and constant rise that reach in a 64.6% of increase since the start of the investment. About the volatility the mix strategy is a bit better than the best strategy of the MACD but worse than the one based on the RSI, which is very low, but in this scenario where the portfolio does not experiment any downtrend year and has a continues growth during the four years, it is not a worry alarm that could penalized this strategy.

	Average annual profitability	Volatility	68% of probability		95% of probability		99% of probability	
			Low	High	Low	High	Low	High
Combined	16,15%	6,29%	9,86%	22,44%	3,57%	28,73%	-2,72%	35,02%

Figure 78. Ranges of performances with different approximate probabilities.

With this mix strategy, it is reflected the good performance obtained much higher than the inflation and with a better annualized performance than a great number of hedge funds or portfolios of asset management entities. Also, it is shown the effect of the asset diversification in the volatility, which used to have greater numbers with high profitable strategies, but now has been softened thanks to the diversification.

4.4. Relationship between technical indicators sign of buy and sell with news that affect to the Company.

In this section, it is going to be discussed the relationship between the events around the companies, as news or annual and quarterly reports that affect them and use to determine new fundamental analysis about the objective price of the stock, and the technical analysis. It is going to be showed a relationship between technical indicators and news and reports that affect directly to the companies. These completely different understanding of the changes in the prices of the stocks, have been historically separated and confronted, but they are related. “In addition, we searched for evidence that technical analysis and fundamental analysis can complement each other in these markets” (SILV18)

Usually, investors that support one of these investment methodologies hate and do not believe in the other method or just think that is not practical or safe to use and to invest money. However, during this chapter has done some research about how these methods are not completely independents and are related between them, refusing the independence of them given by most of the traditional methods.

There is an important amount of people that do not believe in technical analysis because it is viewed as very complex mathematical calculus that do not have taken into account anything that happen to the company or to the industry, just charts. So, reflecting and showing these relations between some news and the reactions of the RSI and the MACD, it is being tried to encourage people and increase the credibility and confidence to this way of design investment strategies based on technical indicators, specifically to RSI and MACD, which it has worked.

“Simple technical analysis cannot capture the complex scope of preferences or values of society and individuals. However, decision making need to be sustained by formal analysis” (BOHN98)

It has been taken relevant news or presentations of annual or quarterly reports that have been affected directly to the company and it is going to be exposed how technical indicators have reacted to these events. If they have changed and given some sign of buy and sell after that, how long they have spent in answer to these events and if the response or passivity of them have beneficiate with a profitable operation or by no taking a wrong operation.

11 news or reports, one of each stock, are going to be commented and related with the different operations that have been place in this frame of time. These news and reports are:

- Enagas. In April of 2018 Enagas bought with most of the participation an operator of gas in Greece. With this operation Enagas acquired in April of 2018 the 66% of Desfa, the Greek operator of the transport of gas in the country. This positive event to the company because of the key position of Greece in his strategy and the industry make that the stock of Enagas continue the rise until mid-May when had a little fall . In this case the RSI cannot identify it in time but MACD yes, by giving a buy signal, with the short-term period’s strategy. However, because another operation of this strategy was working the buy cannot take place and the operation just continue working as was doing until the date. (ECON18).
- Zardoya Otis. Announcement the pay of a dividend per share on September of 2018 and again the MACD with the strategy of short-term periods identify it, with the good reaction of the market and order a buy sign that in this case was convert into a real entry into a profitable operation. (FINA18).
- Facebook privacy crisis. Washington D.C.´s attorney general sued Facebook, alleging the failure of the company in the protection of the private information of the users and the use of it to target voters in the presidential election of 2016. The MACD identify it and make a sell signal on December 15, saving a fall of more of the 5%. (SPAN18)
- Visa Inc. At the end of the June of 2016 Visa complete the acquisition of Visa Europe. Visa stock start raising next week after the announce and the MACD identify it just 7 days after the announce and execute a buy sign, starting a operation that end being 28% profitable. Some strategies taken by the RSI also identify it and start operations because of a buy sign. (ECON16).
- United Health Group. Announce on 17 of March in 2017 the extension of exchange offers to acquire Surgical Care Affiliates, Inc. The strategy of MACD identify it a bit late, with 10 days,

and all the strategies with the RSI executed a buy sign between 4 and 10 days after the announce. (UNIT17).

- Kraft Heinz Company announce in January of 2017 a joint venture with Oprah Winfrey, after that the price of the stock rise more of a 15% and the midterm periods strategy taken with the MACD identify it by buying a position, but because of retained the position too much had a unprofitable operation. (MULL17)
- Mastercard: was punished on 22 of January of 2019 with a penalty of 570 millions of euros by the European Commission because of the block of the free market. Most of the strategies that followed the RSI, make a sell order a couple days later because of the effect of the new in the stock price, while the strategies that were based on the MACD was inside an operation but did not identify it and did not react. (CINC19)
- AbbVie: was sued by the California insurance regulator because AbbVie had given illegal kickbacks to health-care provider. On 18 of September of 2018. However, this new did not have enough impact to the stock´s price and any of the strategies were able of make a sale order. With this no reaction of the investment strategy, it is shown one of the main advantages of technical analysis of forbid the emotions. If a fundamental analysis had been followed, here or emotions had sold the stock because a bad new to the company could mean a fall in the price, but it was not the case and the stock´s price did not fall, so it had been a bad sale. (LANG18).
- Abbot Laboratories: expand a contract with Grifols value in 646 millions of euros on 20 of July of 2015. Both technical indicators identify it but most of the operations were working already, so any movement was done. (ELPA15).
- Merck & Co.: announce the 8 of March of 2016, a record in his historical revenues thanks to the new materials. Any of the technical indicators changed enough during the following days because of the little change in the price of the stock. (CINC16).

In conclusion, it is truth that technical indicators are not affected directly by news or external facts that affect the business of the stock. However, all these events use to affect the stock price, as it is logic because of the great impact that social media and internet news or any kind of new have today in our behavior (MARA15). So, the change in the prices affect the values of the technical indicators, so they can react to these events in an indirectly way, to a faster response to them is required short periods of the indicators that are able to identify rises and falls very quickly. There are certain times that indicators do not answer to these facts just because they have not changed the price of the stock, and this is a really good response because our instinct try to relate everything, as bad or good, with a stock price when it is in our portfolio or it is been analyzed with a chance of go into it, but not all the news related to the company have enough weight or importance to the stock´s price.

“Prediction is also based on textual information, based on the logical assumption that the course of a stock price can also be affected by news articles and perhaps by public opinions, as posted on various Web 2.0 platforms” (MANM, 2015)

In the other hand, there are news that do not affect the stock´s price in the short run but could have a great impact in the business of the company in the long run, but most of the market cannot appreciate it, it would be a value investment. With technical indicators these kinds of operations, which use to be the most profitable, are rarely taken because the goal of the technical analysis is identify trends and take advantage of them but not anticipate future trends. So to make it possible and take advantage of anticipate a trend, it is possible to complement the RSI and MACD with stock´s news. It has done some researches about the use of them as complements in a same investment strategy, providing more information to the investment decision and allowing a strategy based on technical indicators the chance of anticipate to the market. (ZHAI07).

4.5. Portfolio optimization by genetic algorithms.

This last section related to the performances, where has been exposed the results that has been obtained by different strategies that are recommended or that have been optimized (strategies make by humans), is dedicated to an optimization make by genetic algorithms, it means by a software that uses machine learning to improve and optimize the performance of the strategy by giving a final result in form of the best parameters to each stock or each group of stocks.

As it has been explained in the second chapter, this algorithm evaluates a function, which has been introduced previously in the code and which maximize the profitability, but also take into account the number of positive operations realized. Then is made a ranking to just select the best parameters of all of them.

Once the best are selected, they would reproduce to obtain the “sons of the bests”, this process is repeat again and again until the best or a very near solution is achieved.

However, this results based on past data does not mean that is going to be the best parameters to the future, but in technical analysis it is believed that in the stock market the past is the best way to predict the future and that the future is a mirror of some period of the past, so how this algorithm has developed the ability of survive and take the best performance in a long period, it will be able to get if not the best a really good performance in the future. Anyway, this algorithm could be updated day to day with the new stock´s data and continue improving, it will be explained in the last chapter.

It has been used a group of stocks with different trends to test the optimization with genetic algorithms and look if truly it could create an investment strategy with a greater performance than the rest that have been used. These stocks selected are United Health Group, Enagas, Facebook and Kraft Heinz Company. The optimization has reached a total performance of 112,4%, with a long period to the MACD of 17 and a short period of 10 and applying a minimum duration to each operation of 50 days and barriers, which identify the change in a trend, in zero. While the best performance obtained with the used strategies with these stocks had been a 107%, so It has been improved by a 5%.

This optimizer is not getting all the potential that is thought to achieve, so it is hoped with the time and with the improvements making to the code and ponderation of the average positive operations that great improvements could be made by obtaining greater returns. Now this optimization is in a testing period and new updates are continuously adding to it and improving it.

5. Conclusions and future applications.

After the realization of this project has been explained and understood different ways of use the technical analysis and more concrete the RSI and the MACD with different investment strategies, checking that these indicators and their interpretations can make real solid and profitable strategies if they are studied and well applied and adapted.

The strategies based on the RSI could made a really great investments opportunities with this portfolio without the requirement of have been complemented by any other indicator or information that helped the signs and the critical values of this indicator that signed the opportunities of sell and buy. However, some limitations have been seeing as well, so as it has been a great indicator to take investment based on it, but it could be improved by complementing with other technical indicators or fundamental information.

With the strategies based on the MACD has been followed a very similar line that with the RSI, and the results have been really good and this indicator has been able to create different opportunities in the portfolio with great performances, or even better than the achieved with the RSI, if the potential profitability is the main target. The well understand of this indicator and how it worked, opened the possibility of modifying it what has been translate into a considerable improvement of the results. Barriers at zero are the real indicator of change in trends but with longer periods as normal, these values can react with certain retards causing losses or a late exit of the operation that is translate in a less profitable operation. So, moving up these barriers it is able to make less risky operations that identify the change into a downtrend before it could hardly affect the profitability of the operation.

Comparing how each of the different groups of stock has answered to each of the investment strategies, a higher improvement has been observed with the standard strategies in group of stocks that has been followed a bearish trend. The losses, which have been produced with these stocks during the four-year period that has been operated, have improved considerably getting much better results, reaching the point of take profitable strategies with the MACD, which at the beginning could seem a really hard work. This group has punished hardly all the strategies with the RSI that have put a very high overbought barrier (bullish strategies), because rarely these stocks have been able to reach these points and it has been translate into very long operations with bad performances and high volatilities between the performances because of the few stability that stocks in bearish trends use to have.

The group of stocks with a bullish trend also has been beneficiate with great performances and reducing the volatility of the market but it has been more difficult to beat the passive strategy of buy at the beginning of the period and sell at the end (buy and hold). The reason has been the great profitability that has experimented the stocks by themselves and a lower capacity of these technical indicators to get all the potential of an uptrend by selling the stock in the highest price and identifying the trend right in the beginning. It is not a problem and it is understandable, if it is thought about a stock that is in a continuous and permanent uptrend during a period, it would be impossible to beat the passive strategy, because of the inexistence of downtrend periods, so when there are stocks that have very short periods with a bearish trend and the rest of the time the stock is just rising, the target of beat the passive strategy is really hard.

The stocks that have been experimented lateral movements during the period, which has been operated, have been separated just with strategies based on the RSI because of the similarity with the other groups in terms of responses to most of the values of the MACD and expected performances obtained with different strategies based on it. However, the good performances that the RSI can get with this kind of stocks has been the main reason to differentiate them to the other uptrend and downtrend groups and divide into different groups to see how specifically answered to each of the strategies. The performance of the strategy based on the RSI, with barriers of overbought and oversold in 85 and 55 respectively, with the lateral movement uptrend group of stock has been grateful with a total profitability greater than a 100%. This strategy and the RSI has adapted really well to this group, by identifying signs in best moments thanks to the lateral movements of the price that empower the reach of each of the barriers, to achieve the best potential and to stop losses when it was necessary.

The optimization with genetic algorithms has been the tool that has opened our mind to the wide range of possibilities that these strategies have and would have in the future with the advances and implementation of new technologies, as machine learning, in this field. The tests and optimize strategies that has been developed has achieved great and expected performances by reducing the negative operations to the range adjusted before the optimization and maximizing the profitability of the investment.

There have been some difficulties because of the power of the processor that requires the execution of these genetic algorithms, which are rarely find in commercial computers, and with could be done all the optimization done in less time and a wider range of optimization possibilities by creating group of stocks and optimize portfolios instead of optimize just stock by stock or by optimizing more complex and with a wider range of values technical indicators or inclusive mixing different types of indicators.

There are hundreds of investment firms that are using technical analysis with complex machine learning programs and are growing day to day, these programs are evolving and improving day to day, because of the capacity to learn with the increase of input data that arrives every day.

CEFLANN (Computational Efficient Functional Link Artificial Neural Network), is a great example of it, this neural network has the ability of create buy and sell signals with and output of 0 or 1, based on the main rules of technical analysis and with a big learning ability and with a well structure method of analysis that work following these steps (DASH16).

- Extract technical indicators.
- Trend analysis using technical indicators.
- Generation of trading signal from trend analysis.
- Data normalization.
- Network structure creation and training using ELM.
- Determination of the trend from output trading signal.
- Decision of the trading point.
- Calculation of the profitability.

This neural model was compared with stock indexes (BSE SENSEX and S&P 500) and other machine learning programs and the results were satisfactory, creating a new way of investing with a wide range of possibilities to the investor.

These kind of algorithms are also very useful and will have more power in the future with intraday operations, these fast operations allow that the quantity of inputs coming to the model is much bigger rather than with long-term investment, so the program is able to learn with this information faster (PATE15). However, it has been tested as well and can be really useful as it has looked with the optimization in this project in the long term, where there are also more way of investment to investor with other targets, as the ones that would like to achieved high profitability, better than buy and hold but do not want a high exposure to the market, it means that operations should not be active during long periods and the strategy should take as few operations as possible (LAMA10).

Furthermore, there are also methods that are been developed since the 90´s, which are able to apply and join the genetic algorithms working with technical data and with news, as has been joined during the fourth chapter.

6. Bibliography.

[KIRK11] Charles D. Kirkpatrick and Julie R. Dahlquist. “Technical Analysis”. The complete guide of technical analysis. 2011.

[CHEN10] James Chen “Essential of Technical Analysis for Financial Market”, 2010.

[FAMA95] Eugene F. Fama.”Random Walks in Stock Market Prices”, Financial Analysts Journal, 51:1, pp. 75-80. 1995.

[ELLI05] Ellis C. and Parbery S.A., “Is smarter better? A comparison of adaptive, and simple moving average trading strategies.” Res Int Bus Financ 19(3): 399-411. 2005.

[SILV18] Matheus José Silva de Souza, Danilo Guimaraes Franco Ramos, Marina Garcia Pena, Vinicius Amorim Sobreiro and Herbert Kimura. “Examination of the profitability of technical analysis based on moving average strategies in BRICS”, Financial Innovation 2018,. February, 2018.

[CHON08] Chong, T. T.-L and Ng, W.-K. (2008) “Technical analysis and the London stock exchange, testing the MACD and RSI rules using the FT30”, Applied Economics Letters, 15, 1111-14.

[MURP99] Murphy, J.J. (1999) “Technical Analysis of the Financial Markets”, Institute of Finance, New York.

[ROSI12] R. Rosillo, D. de la Fuente & J. A. L. Brugos. “Technical analysis and the Spanish stock exchange: testing the RSI, MACD, momentum and stochastic rules using Spanish market companies.” February, 2012.

[TAIT14] Terence Tai Leung Chong. “Revisiting the Performance of MACD and RSI Oscillators.” March, 2014

[BLOO19] Bloomberg. Moving Average Convergence/Divergence (MACD).

[WELL78] J. Welles Wilder Jr., “New Concepts in Technical Trading Systems”, Greensboro, NC: Trend Research, 1978.

[ROSE10] Corey Rosenbloom, CMT. “The complete trading course.” November, 2010.

[ACHE01] Steven B. Achelis. “Technical Analysis from A to Z.” 2001

[SILV18] Matheus José Silva de Souza, Danilo Guimaraes Franco Ramos, Marina Garcia Pena, Vinicius Amorim Sobreiro and Herbert Kimura. "Examination of the profitability of technical analysis based on moving average strategies in BRICS", Financial Innovation 2018, February, 2018.

[MARA15] Maragoudakis, M. and Serpanos, "Exploiting financial News and social media opinions for stock market analysis using MCMC Bayesian Inference" D. Comput Econ (2016) 47: 589.

[BOHN98] Hans Bohnenblust and Paul Slovic, "Integrating technical analysis and public values in risk-based decision making", Reliability Engineering & System Safety, Volume 59, Issue 1. Pp. 151-159. January 1998.

[LAMA10] Adriano Lamartine Almeida Teixeira and Lorena Ináciode Oliveira. "A method for automatic stock trading combining technical analysis and nearest neighbor classification", Expert Systems with Applications. Volume 37, Issue 10. October 2010.

[DASH16] Rajashree Dash and Pradipta Kishore Dash. "A hybrid stock trading framework integrating technical analysis with machine learning techniques," March 2016.

[THOM00] Thomas, J.D. and Sycara, K. "Integrating genetic algorithms and text learning for financial prediction". Proceedings GECCO-2000 workshop on data mining with evolutionary algorithms. pp. 72-75. Las vegas, NV. 2000.

[PATE15] Jigar Patel, Sahil Shah, Priyank Takkar and K.Kotecha. "Predicting stock and stock price index movement using Trend Deterministic Data Preparation and machine learning techniques". Expert Systems with Applications. Volume 42, Issue 1. January 2015.

[HAYE19] Adam Hayes. "Moving Average Convergence Divergence – MACD", Investopedia. July, 2019.

[EDWA18] Robert D. Edwards, John Magee and W.H.C. Bassetti. "Technical Analysis of Stock Trends" 11th Edition. July, 2018.

[ZHAI07] Yuzheng Zhai, Arthur Hsu and Saman K. Halgamuge. "Combining News and Technical Indicators in Daily Stock Price Trends Prediction". 2007.

[ECON18] El Economista, "Un consorcio participado por Enagás adquiere el operador de gas griego". July, 2018.

[FINA18] Web Financial Group S.A. "Zardoya Otis pagará el 10 de octubre un dividendo de 0.08 euros por acción". Blog Bankinter. September, 2018.

[SPAN18] Todd Spangler. “Facebook´s Ongoing Privacy Crises: What Happens Next After a Disastrous 2018?”. December 2018.

[ECON16] El Economista.” Visa Inc. Completa la adquisición de Visa Europe”. Junio, 2016.

[UNIT17] United Health Group. “United Health Group Announces extension of exchange offer to acquire surgical care affiliates, Inc”. March 2017.

[MULL17] Michael Mullen. “The Kraft Heinz Company and Oprah Winfrey Announce Joint Venture”. January, 2017.

[CINC19] Cinco Días. “La CE multa a Mastercard con 570 millones euros por impedir la libre competencia”. Enero, 2019.

[LANG18] Robert Langreth. “California sues AbbVie over alleged arthritis drug kickbacks”. September, 2018.

[ELPA15] El País.” Grifols amplía un contrato con Abbot de 646 millones de euros”. July, 2015.

[CINC16] Cinco Días. “Los nuevos materiales relanzan a la centenaria Merck”. March, 2016.

7. Attached documents.

Here it is all the information about all the operations, with all the strategies applied to each stock. The last two strategies for each stock are the strategies with the MACD, beginning with the 21,13,1, following with the 34,21,1 and ending with the 144,34,1. It is the same order in all the stocks.

United Health Group.

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	N. days operation	Cumulative performance
RSI14	01/05/2015	30/05/2015	7,20%		7,20%	20	7,20%
BUY 30	11/06/2015	23/09/2015	4,60%		4,60%	72	11,80%
SELL 70	09/01/2016	27/02/2016	6,20%		6,20%	33	18,00%
	14/04/2016	02/06/2016	4,50%		4,50%	34	22,50%
	12/08/2016	30/09/2016	-3,20%	1,80%	-1,40%	34	21,10%
	08/11/2016	10/12/2016	17,90%		17,90%	23	39,00%
	20/01/2017	11/03/2017	6,60%		6,60%	35	45,60%
	24/03/2017	22/04/2017	3,20%		3,20%	20	48,80%
	17/05/2017	21/06/2017	5,70%		5,70%	24	54,50%
	03/01/2018	20/04/2018	3,40%	1,23%	4,63%	74	59,13%
	06/07/2018	11/08/2018	5,10%		5,10%	26	64,23%
	20/12/2018	24/01/2019	5,10%		5,10%	22	69,33%

		Media	(X-media)^2	Varianza	Desviación típica
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +59.1	0,057775	0,00020235	0,00177711	0,042155745
TOTAL PROFIT (%): +66.3	MINIMUM PROFIT STREAK (%): +0.0		0,00013865		
PROFIT/YEAR (%): +16.3	AVERAGE PROFIT/OPERATION (%): +5.5		1,7851E-05		
COMPOUND PROFIT (%): +88.6	MAXIMUM PROFIT/OPERATION (%): +17.9		0,0001632		
PASSIVE PROFIT (%): +131.0	MINIMUM PROFIT/OPERATION (%): -3.2		0,00515165		
NUMBER OF OPERATIONS: 12	AVERAGE OPERATION DURATION (days): 34.8		0,0146955		
NUMBER OF OPERATIONS/YEAR: 2.9	MAXIMUM OPERATION DURATION (days): 74		6,7651E-05		
% OF POSITIVE OPERATIONS: 91.7	MINIMUM OPERATION DURATION (days): 20		0,00066435		
% OF NEGATIVE OPERATIONS: 8.3	ACTIVE OPERATION TIME (%): 40.7		6,0063E-07		
MAXIMUM PROFIT (%): +66.3	**MINIMUM PROFIT (%): +7.2**		0,00013168		
			4,5901E-05		
Volatilidad 4,22%			4,5901E-05		

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	N. days operation	Cumulative performance
RSI14	01/05/2015	03/06/2015	4,90%		4,90%	22	4,90%
BUY35	10/06/2015	01/03/2016	6,50%		6,50%	182	11,40%
SELL80	13/04/2016	04/06/2016	8,60%		8,60%	37	20,00%
	12/08/2016	22/11/2016	9,20%	1,80%	11,00%	71	31,00%
	18/01/2017	11/03/2017	3,70%		3,70%	37	34,70%
	22/03/2017	22/04/2017	2%		2,00%	22	36,70%
	17/05/2017	31/10/2017	17,40%	2,96%	20,36%	116	57,06%
	17/11/2017	24/01/2018	9,60%	1,33%	10,93%	44	67,99%
	07/02/2018	23/05/2018	21,70%	1,23%	22,93%	73	90,92%
	06/07/2018	18/08/2018	7,80%		7,80%	31	98,72%
	27/09/2018	25/01/2019	3,70%	1,36%	5,06%	81	103,78%

		Media	(X-media)^2	Varianza	Desviación típica
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +90.3	0,09434545	0,00205621	0,00405469	0,063676446
TOTAL PROFIT (%): +95.2	MINIMUM PROFIT STREAK (%): +0.0		0,00086116		
PROFIT/YEAR (%): +23.4	AVERAGE PROFIT/OPERATION (%): +8.7		6,9647E-05		
COMPOUND PROFIT (%): +145.5	MAXIMUM PROFIT/OPERATION (%): +21.7		0,00024506		
PASSIVE PROFIT (%): +131.0	MINIMUM PROFIT/OPERATION (%): +2.0		0,0032885		
NUMBER OF OPERATIONS: 11	AVERAGE OPERATION DURATION (days): 65.1		0,00552725		
NUMBER OF OPERATIONS/YEAR: 2.7	MAXIMUM OPERATION DURATION (days): 182		0,01193656		
% OF POSITIVE OPERATIONS: 100.0	MINIMUM OPERATION DURATION (days): 22		0,00022364		
% OF NEGATIVE OPERATIONS: 0.0	ACTIVE OPERATION TIME (%): 69.9		0,01821273		
MAXIMUM PROFIT (%): +95.2	**MINIMUM PROFIT (%): +4.9**		0,00026717		
			0,00191366		
Volatilidad 6,37%					

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	N. days operation	Cumulative performance
RSI14	02/05/2015	03/06/2015	6%		6%	21	6,00%
BUY25	11/06/2015	01/03/2016	6,50%		7%	181	12,50%
SELL80	26/08/2016	22/11/2016	12,70%	1,80%	15%	61	27,00%
	25/01/2017	11/03/2017	6,20%		6%	32	33,20%
	24/03/2017	22/04/2017	3,20%		3%	20	36,40%
	18/05/2017	31/10/2017	19,80%	2,96%	23%	115	59,16%
	04/01/2018	23/05/2018	13%	1,23%	14%	96	73,39%
	06/07/2018	18/08/2018	7,80%		8%	31	81,19%

		Media	(X-media)^2	Varianza	Desviación típica
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +74.7	0,1014875	0,00172121	0,00368192	0,060678815
TOTAL PROFIT (%): +80.7	MINIMUM PROFIT STREAK (%): +0.0		0,00133134		
PROFIT/YEAR (%): +19.8	AVERAGE PROFIT/OPERATION (%): +9.0		0,00189334		
COMPOUND PROFIT (%): +114.7	MAXIMUM PROFIT/OPERATION (%): +19.8		0,00155926		
PASSIVE PROFIT (%): +133.6	MINIMUM PROFIT/OPERATION (%): +3.2		0,00482851		
NUMBER OF OPERATIONS: 9	AVERAGE OPERATION DURATION (days): 64.4		0,01590436		
NUMBER OF OPERATIONS/YEAR: 2.2	MAXIMUM OPERATION DURATION (days): 181		0,00166566		
% OF POSITIVE OPERATIONS: 100.0	MINIMUM OPERATION DURATION (days): 20		0,00055166		
% OF NEGATIVE OPERATIONS: 0.0	ACTIVE OPERATION TIME (%): 56.6				
MAXIMUM PROFIT (%): +80.7	**MINIMUM PROFIT (%): +6.0**				
Volatilidad 6,07%					

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	N. days operation	Cumulative performance
RSI14	26/08/2015	24/09/2015	11,40%		11,40%	20	11,40%
BUY20	27/08/2016	27/09/2016	1%	1,80%	2,80%	20	14,20%
SELL65	25/01/2017	02/03/2017	5,50%		5,50%	25	19,70%
	29/03/2017	27/04/2017	3,90%		3,90%	20	23,60%
	18/05/2017	21/06/2017	7,90%		7,90%	23	31,50%
	22/12/2018	24/01/2019	10,90%		10,90%	20	42,40%

		Average	(X-average)^2	Variance	standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +29.2	0,07066667	0,00187778	0,00108089	0,032876875
TOTAL PROFIT (%): +40.6	MINIMUM PROFIT STREAK (%): +0.0		0,00182044		
PROFIT/YEAR (%): +10.0	AVERAGE PROFIT/OPERATION (%): +6.8		0,00024544		
COMPOUND PROFIT (%): +47.6	MAXIMUM PROFIT/OPERATION (%): +11.4		0,00100278		
PASSIVE PROFIT (%): +139.1	MINIMUM PROFIT/OPERATION (%): +1.0		6,9444E-05		
NUMBER OF OPERATIONS: 6	AVERAGE OPERATION DURATION (days): 21.3		0,00146944		
NUMBER OF OPERATIONS/YEAR: 1.5	MAXIMUM OPERATION DURATION (days): 25				
% OF POSITIVE OPERATIONS: 100.0	MINIMUM OPERATION DURATION (days): 20				
% OF NEGATIVE OPERATIONS: 0.0	ACTIVE OPERATION TIME (%): 12.5				
MAXIMUM PROFIT (%): +40.6	**MINIMUM PROFIT (%): +11.4**				

Volatility 3,29%

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	N. days operation	Cumulative performance
RSI14	11/02/2015	04/03/2016	15,50%		15,50%	267	15,50%
BUY55	12/03/2016	23/11/2016	28,70%	3,54%	32,24%	178	47,74%
SELL85	31/12/2016	11/03/2017	3,30%		3,30%	47	51,04%
	21/03/2017	25/01/2019	48%	10,98%	58,98%	465	110,02%
	12/02/2019	15/02/2019	0,40%		0,40%	4	110,42%

Average	(X-average)^2	Variance	standard deviation
0,22084	0,00433491	0,04661685	0,215909366
	0,01031443		
	0,03528387		
	0,13613148		
	0,04701959		

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +96.0
PROFIT/YEAR (%): +23.6
COMPOUND PROFIT (%): +128.4
PASSIVE PROFIT (%): +147.0
NUMBER OF OPERATIONS: 5
NUMBER OF OPERATIONS/YEAR: 1.2
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +96.0

MAXIMUM PROFIT STREAK (%): +80.5
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +19.2
MAXIMUM PROFIT/OPERATION (%): +48.0
MINIMUM PROFIT/OPERATION (%): +0.4
AVERAGE OPERATION DURATION (days): 192.2
MAXIMUM OPERATION DURATION (days): 465
MINIMUM OPERATION DURATION (days): 4
ACTIVE OPERATION TIME (%): 93.8
MINIMUM PROFIT (%): +15.5

Volatility 21,59%

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	N. days operation	Cumulative performance
RSI14	12/02/2015	24/11/2016	49%	3,54%	52,54%	451	52,54%
BUY45	10/01/2017	29/01/2019	51,60%	10,98%	62,58%	515	115,12%
SELL90	12/02/2019	15/02/2019	0,40%		0,40%	4	115,52%

Average	(X-average)^2	Variance	standard deviation
0,38506667	0,01969344	0,07428593	0,272554451
	0,05795254		
	0,1452118		

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +101.0
PROFIT/YEAR (%): +24.8
COMPOUND PROFIT (%): +126.9
PASSIVE PROFIT (%): +143.4
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +101.0
Volatility 27,26%

MAXIMUM PROFIT STREAK (%): +52.1
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +33.7
MAXIMUM PROFIT/OPERATION (%): +51.6
MINIMUM PROFIT/OPERATION (%): +0.4
AVERAGE OPERATION DURATION (days): 323.3
MAXIMUM OPERATION DURATION (days): 515
MINIMUM OPERATION DURATION (days): 4
ACTIVE OPERATION TIME (%): 94.6
MINIMUM PROFIT (%): +49.0

The following figure is the same for strategies 10-60 and 10-50.

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
25-Dec-2018	25-Jan-2019	12,80%	0	12,80%	20	12,80%

BUY 10
SELL 50

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +12.8
PROFIT/YEAR (%): +3.2
COMPOUND PROFIT (%): +12.8
PASSIVE PROFIT (%): +11.9
NUMBER OF OPERATIONS: 1
NUMBER OF OPERATIONS/YEAR: 0.2
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +12.8
MINIMUM PROFIT (%): +12.8

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +12.8
MAXIMUM PROFIT/OPERATION (%): +12.8
MINIMUM PROFIT/OPERATION (%): +12.8
AVERAGE OPERATION DURATION (days): 20.0
MAXIMUM OPERATION DURATION (days): 20
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 2.0

Volatility 0

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
15/04/2015	09/06/2015	-9,00%		-9,00%	38	-9,00%
11/06/2015	12/06/2015	0,80%		0,80%	1	-8,20%
23/06/2015	03/07/2015	3,20%		3,20%	8	-5,00%
06/08/2015	07/08/2015	0,90%		0,90%	1	-4,10%
12/08/2015	25/09/2015	-1,30%		-1,30%	31	-5,40%
24/10/2015	29/10/2015	5,10%		5,10%	2	-0,30%
02/12/2015	04/12/2015	0,00%		0,00%	3	-0,30%
05/12/2015	08/12/2015	1,80%		1,80%	1	1,50%
11/12/2015	17/12/2015	2,50%		2,50%	4	4,00%
09/01/2016	24/02/2016	5,40%		5,40%	30	9,40%
15/04/2016	12/05/2016	2,30%		2,30%	19	11,70%
13/05/2016	07/06/2016	3,60%		3,60%	16	15,30%
03/08/2016	06/10/2016	-4,80%	1,80%	-3,00%	45	12,30%
06/01/2017	08/03/2017	3,50%		3,50%	41	15,80%
29/03/2017	29/04/2017	4,60%		4,60%	22	20,40%
18/05/2017	16/06/2017	7,20%		7,20%	20	27,60%
20/07/2017	06/09/2017	1,70%		1,70%	33	29,30%
08/09/2017	07/10/2017	1,80%		1,80%	21	31,10%
12/10/2017	20/10/2017	4,70%		4,70%	6	35,80%
08/12/2017	14/12/2017	-1,00%		-1,00%	4	34,80%
30/12/2017	27/01/2018	4,40%		4,40%	18	39,20%
07/02/2018	19/04/2018	11,60%	1,23%	12,83%	49	52,03%
30/06/2018	18/08/2018	8,40%		8,40%	34	60,43%
13/09/2018	14/11/2018	6,30%		6,30%	44	66,73%
24/11/2018	28/11/2018	2,10%		2,10%	2	68,83%
18/12/2018	26/01/2019	2,30%	1,36%	3,66%	26	72,49%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +68.3
PROFIT/YEAR (%): +16.7
COMPOUND PROFIT (%): +92.3
PASSIVE PROFIT (%): +104.9
NUMBER OF OPERATIONS: 26
NUMBER OF OPERATIONS/YEAR: 6.4
% OF POSITIVE OPERATIONS: 84.6
% OF NEGATIVE OPERATIONS: 15.4
MAXIMUM PROFIT (%): +68.3
MINIMUM PROFIT (%): -9.0

MAXIMUM PROFIT STREAK (%): +77.2
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +2.6
MAXIMUM PROFIT/OPERATION (%): +11.6
MINIMUM PROFIT/OPERATION (%): -9.0
AVERAGE OPERATION DURATION (days): 20.0
MAXIMUM OPERATION DURATION (days): 49
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 50.6

Volatility 24,93%

Average	(X-average)^2	Variance	Standard deviation
22,17%	0,097154492	0,06213934	0,249277646
	0,092231354		
	0,0738188		
	0,069009269		
	0,076008369		
	0,050488362		
	0,050488362		
	0,0427233		
	0,033013492		
	0,016306308		
	0,010961285		
	0,004719162		
	0,009740931		
	0,0040572		
	0,000313154		
	0,002948908		
	0,005084238		
	0,007975177		
	0,018578738		
	0,015952662		
	0,0290034		
	0,089164257		
	0,146385703		
	0,198562788		
	0,217719149		
	0,253214111		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	26/02/2015	4,40%		4,40%	3	4,40%
29/04/2015	17/03/2016	3,00%		3,00%	223	7,40%
04/05/2016	18/11/2016	24,20%	1,80%	26,00%	139	33,40%
21/01/2017	09/11/2017	21,60%	2,97%	24,57%	203	57,97%
20/12/2017	15/05/2018	5,30%	1,23%	6,53%	99	64,50%
10/07/2018	26/02/2019	4,40%	1,36%	5,76%	158	70,26%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +67.2
PROFIT/YEAR (%): +16.7
COMPOUND PROFIT (%): +86.0
PASSIVE PROFIT (%): +137.6
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.5
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +67.2
MINIMUM PROFIT (%): +4.4

MAXIMUM PROFIT STREAK (%): +62.9
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +11.2
MAXIMUM PROFIT/OPERATION (%): +24.2
MINIMUM PROFIT/OPERATION (%): +3.0
AVERAGE OPERATION DURATION (days): 137.5
MAXIMUM OPERATION DURATION (days): 223
MINIMUM OPERATION DURATION (days): 3
ACTIVE OPERATION TIME (%): 81.5

Volatility 26,49%

Average	(X-average)^2	Variance	Standard deviation
39,66%	0,124291503	0,07019674	0,264946672
	0,104038503		
	0,003912503		
	0,033543923		
	0,061727403		
	0,093666603		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30/07/2015	04/08/2015	-0,90%		-0,90%	3	-0,90%
15/10/2015	16/04/2016	8,90%		8,90%	132	8,00%
01/07/2017	05/09/2018	41,90%	7,26%	49,16%	296	57,16%
22/12/2018	27/02/2019	8,90%	1,36%	10,26%	44	67,42%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): +58.8
PROFIT/YEAR (%): +16.4
COMPOUND PROFIT (%): +66.8
PASSIVE PROFIT (%): +107.1
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.1
% OF POSITIVE OPERATIONS: 75.0
% OF NEGATIVE OPERATIONS: 25.0
MAXIMUM PROFIT (%): +58.8
MINIMUM PROFIT (%): -0.9

MAXIMUM PROFIT STREAK (%): +59.7
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +14.7
MAXIMUM PROFIT/OPERATION (%): +41.9
MINIMUM PROFIT/OPERATION (%): -0.9
AVERAGE OPERATION DURATION (days): 118.8
MAXIMUM OPERATION DURATION (days): 296
MINIMUM OPERATION DURATION (days): 3
ACTIVE OPERATION TIME (%): 52.7

Volatility 29,76%

Average	(X-average)^2	Variance	Standard deviation
32,92%	0,11437924	0,08856566	0,297599832
	0,06210064		
	0,05875776		
	0,119025		

Abbot Laboratories.

	Buy dates	Sale dates	Performance	Div.	Prfmn. Dividends	Days of operation	Cumulative Prfmn.
RSI14	07/04/2015	28/05/2015	6%		6,00%	36	6,00%
BUY 30	17/06/2015	27/10/2015	-8,90%		-8,90%	92	-2,90%
SELL 70	09/01/2016	02/03/2016	-7,60%		-7,60%	35	-10,50%
	03/05/2016	02/06/2016	3,40%		3,40%	21	-7,10%
	18/06/2016	19/07/2016	13,30%		13,30%	20	6,20%
	20/08/2016	23/11/2016	-5,70%	2,70%	-3,00%	66	3,20%
	23/03/2017	07/06/2017	-1,80%	2,28%	0,48%	52	3,68%
	10/08/2017	12/09/2017	4,60%	2,03%	6,63%	22	10,31%
	15/02/2018	22/03/2018	9,50%	1,92%	11,42%	24	21,73%
	30/03/2018	15/05/2018	5,50%	1,76%	7,26%	31	28,99%
	06/07/2018	31/08/2018	8,70%	1,68%	10,38%	40	39,37%
	20/10/2018	15/02/2019	9,20%	3,23%	12,43%	80	51,80%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +36.1
PROFIT/YEAR (%): +8.9
COMPOUND PROFIT (%): +38.7
PASSIVE PROFIT (%): +55.4
NUMBER OF OPERATIONS: 12
NUMBER OF OPERATIONS/YEAR: 2.9
% OF POSITIVE OPERATIONS: 66.7
% OF NEGATIVE OPERATIONS: 33.3
MAXIMUM PROFIT (%): +36.1

Volatility 7,28%

MAXIMUM PROFIT STREAK (%): +46.5
MINIMUM PROFIT STREAK (%): -16.5
AVERAGE PROFIT/OPERATION (%): +3.0
MAXIMUM PROFIT/OPERATION (%): +13.3
MINIMUM PROFIT/OPERATION (%): -8.9
AVERAGE OPERATION DURATION (days): 43.2
MAXIMUM OPERATION DURATION (days): 92
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 50.6
MINIMUM PROFIT (%): -10.5

Average	(X-average)^2	Variance	Standard deviation
0,04316667	0,000283361	0,00530314	0,072822688
	0,017468028		
	0,014200694		
	8,40278E-05		
	0,008070028		
	0,005353361		
	0,001472001		
	0,000535151		
	0,005045734		
	0,000866321		
	0,003676401		
	0,006582618		

	Buy dates	Sale dates	Performance	Div.	Prfmn. Dividends	Days of operation	Cumulative Prfmn.
RSI14	25/08/2015	02/11/2015	5%		5,00%	49	5,00%
BUY25	21/06/2016	04/03/2016	-4,60%		-4,60%	30	0,40%
SELL80	04/05/2016	16/07/2016	12,20%		12,20%	51	12,60%
	26/08/2016	15/02/2017	5,30%	5,10%	10,40%	118	23,00%
	23/03/2017	08/06/2017	-2,10%	2,28%	0,18%	53	23,18%
	10/08/2017	10/10/2017	12,10%	2,03%	14,13%	42	37,31%
	15/02/2018	23/05/2018	13,60%	1,76%	15,36%	67	52,67%
	25/12/2018	15/02/2019	10,80%	1,69%	12,49%	36	65,16%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +52.3
PROFIT/YEAR (%): +12.9
COMPOUND PROFIT (%): +63.6
PASSIVE PROFIT (%): +69.4
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 75.0
% OF NEGATIVE OPERATIONS: 25.0
MAXIMUM PROFIT (%): +52.3
Volatility 6,75%

MAXIMUM PROFIT STREAK (%): +51.9
MINIMUM PROFIT STREAK (%): -4.6
AVERAGE PROFIT/OPERATION (%): +6.5
MAXIMUM PROFIT/OPERATION (%): +13.6
MINIMUM PROFIT/OPERATION (%): -4.6
AVERAGE OPERATION DURATION (days): 55.8
MAXIMUM OPERATION DURATION (days): 118
MINIMUM OPERATION DURATION (days): 30
ACTIVE OPERATION TIME (%): 43.5
MINIMUM PROFIT (%): +0.4

Average	(X-average)^2	Variance	Standard deviation
0,08145	0,000989102	0,00455064	0,067458395
	0,016243503		
	0,001644303		
	0,000508503		
	0,006344123		
	0,003582023		
	0,005205623		
	0,001887903		

	Buy dates	Sale dates	Performance	Div.	Prfmn. Dividends	Days of operation	Cumulative Prfmn.
RSI14	07/04/2015	03/11/2015	-3,70%		-3,70%	147	-3,70%
BUY35	08/01/2016	04/03/2016	-8,70%		-8,70%	38	-12,40%
SELL80	03/05/2016	16/07/2016	12,30%		12,30%	52	-0,10%
	20/08/2016	15/02/2017	3,50%	5,10%	8,60%	122	8,50%
	22/03/2017	08/06/2017	-2,30%	2,28%	-0,02%	54	8,48%
	12/07/2017	10/10/2017	10,60%	2,03%	12,63%	63	21,11%
	13/12/2017	02/03/2018	2,80%	1,92%	4,72%	53	25,83%
	30/03/2018	23/05/2018	7,80%	1,76%	9,56%	37	35,39%
	27/06/2018	26/09/2018	16,20%	1,68%	17,88%	63	53,27%
	17/10/2018	15/02/2019	8%	3,23%	11,23%	83	64,50%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +46.4
PROFIT/YEAR (%): +11.4
COMPOUND PROFIT (%): +53.4
PASSIVE PROFIT (%): +55.4
NUMBER OF OPERATIONS: 10
NUMBER OF OPERATIONS/YEAR: 2.5
% OF POSITIVE OPERATIONS: 70.0
% OF NEGATIVE OPERATIONS: 30.0
MAXIMUM PROFIT (%): +46.4
Volatility 7,86%

MAXIMUM PROFIT STREAK (%): +58.8
MINIMUM PROFIT STREAK (%): -8.7
AVERAGE PROFIT/OPERATION (%): +4.6
MAXIMUM PROFIT/OPERATION (%): +16.2
MINIMUM PROFIT/OPERATION (%): -8.7
AVERAGE OPERATION DURATION (days): 71.2
MAXIMUM OPERATION DURATION (days): 147
MINIMUM OPERATION DURATION (days): 37
ACTIVE OPERATION TIME (%): 69.5
MINIMUM PROFIT (%): -12.4

Average	(X-average)^2	Variance	Standard deviation
0,0645	0,01030225	0,00617602	0,078587633
	0,02295225		
	0,00342225		
	0,00046225		
	0,00418609		
	0,00381924		
	0,00029929		
	0,00096721		
	0,01306449		
	0,00228484		

	Buy dates	Sale dates	Performance	Div.	Prfmn. Dividends	Days of operation	Cumulative Prfmn.
RSI14	25/08/2015	27/10/2015	1,50%		1,50%	44	1,50%
BUY20	04/05/2016	02/06/2016	3,30%		3,30%	20	4,80%
SELL65	21/06/2016	20/07/2016	12,80%		12,80%	20	17,60%
	26/08/2016	30/09/2016	-2,80%		-2,80%	24	14,80%
	29/03/2017	07/06/2017	-1,10%	2,28%	1,18%	48	15,98%
	10/08/2017	09/09/2017	1,80%	1,68%	3,48%	21	19,46%
	15/02/2018	16/03/2018	10,40%	1,92%	12,32%	20	31,78%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +24.5	0,0454	0,00092416	0,00294034	0,054224928
TOTAL PROFIT (%): +26.0	MINIMUM PROFIT STREAK (%): +0.0		0,00015376		
PROFIT/YEAR (%): +6.4	AVERAGE PROFIT/OPERATION (%): +3.7		0,00682276		
COMPOUND PROFIT (%): +27.9	MAXIMUM PROFIT/OPERATION (%): +12.8		0,00538756		
PASSIVE PROFIT (%): +69.4	MINIMUM PROFIT/OPERATION (%): -2.8		0,00112896		
NUMBER OF OPERATIONS: 7	AVERAGE OPERATION DURATION (days): 28.1		0,00011236		
NUMBER OF OPERATIONS/YEAR: 1.7	MAXIMUM OPERATION DURATION (days): 48		0,00605284		
% OF POSITIVE OPERATIONS: 71.4	MINIMUM OPERATION DURATION (days): 20				
% OF NEGATIVE OPERATIONS: 28.6	ACTIVE OPERATION TIME (%): 19.2				
MAXIMUM PROFIT (%): +26.0	**MINIMUM PROFIT (%): +1.5**				

Volatility 5,42%

	Buy dates	Sale dates	Performance	Div.	Prfmn. Dividends	Days of operation	Cumulative Prfmn.
RSI14	02/04/2015	10/11/2015	-2,80%		-2,80%	154	-2,80%
BUY 45	10/12/2015	16/07/2016	-8,30%		-8,30%	150	-11,10%
SELL 90	19/08/2016	02/03/2018	23,50%	5,88%	29,38%	385,00%	12,40%
	29/03/2018	20/02/2019	33,50%		33,50%	225	45,90%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MINIMUM PROFIT (%): -11.1	0,12945	0,0256	0,03371543	0,183617622
TOTAL PROFIT (%): +45.9	MAXIMUM PROFIT STREAK (%): +57.0		0,04		
PROFIT/YEAR (%): +11.2	MINIMUM PROFIT STREAK (%): -8.3		0,027010923		
COMPOUND PROFIT (%): +47.0	AVERAGE PROFIT/OPERATION (%): +11.5		0,042250803		
PASSIVE PROFIT (%): +52.7	MAXIMUM PROFIT/OPERATION (%): +33.5				
NUMBER OF OPERATIONS: 4	MINIMUM PROFIT/OPERATION (%): -8.3				
NUMBER OF OPERATIONS/YEAR: 1.0	AVERAGE OPERATION DURATION (days): 228.5				
% OF POSITIVE OPERATIONS: 50.0	MAXIMUM OPERATION DURATION (days): 385				
% OF NEGATIVE OPERATIONS: 50.0	MINIMUM OPERATION DURATION (days): 150				
MAXIMUM PROFIT (%): +45.9	ACTIVE OPERATION TIME (%): 89.0				

Volatility 18,36%

	Buy dates	Sale dates	Performance	Div.	Prfmn. Dividends	Days of operation	Cumulative Prfmn.
RSI14	29/01/2015	28/02/2015	7,80%		7,80%	21	7,80%
BUY 55	23/03/2015	04/11/2015	-4,60%		-4,60%	155	3,20%
SELL 85	02/12/2015	08/04/2016	-12,80%		-12,80%	87	-9,60%
	30/04/2016	16/07/2016	6,40%		6,40%	53	-3,20%
	18/08/2016	28/02/2017	6,60%	2,70%	9,30%	132	6,10%
	15/03/2017	13/06/2017	-1,80%	2,27%	0,47%	62	6,57%
	30/06/2017	05/01/2018	14,80%	2,03%	16,83%	130	23,40%
	18/01/2018	02/03/2018	0,70%	1,92%	2,62%	30	26,02%
	24/03/2018	27/09/2018	22,90%	1,76%	24,66%	129	50,68%
	13/10/2018	20/02/2019	9,50%	1,69%	11,19%	87	61,87%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MINIMUM PROFIT (%): -9.7	0,17284	0,008994626	0,04887448	0,221075735
TOTAL PROFIT (%): +49.3	MAXIMUM PROFIT STREAK (%): +59.0		0,019835906		
PROFIT/YEAR (%): +12.1	MINIMUM PROFIT STREAK (%): -17.4		0,072274946		
COMPOUND PROFIT (%): +55.1	AVERAGE PROFIT/OPERATION (%): +4.9		0,041959426		
PASSIVE PROFIT (%): +68.8	MAXIMUM PROFIT/OPERATION (%): +22.9		0,012508186		
NUMBER OF OPERATIONS: 10	MINIMUM PROFIT/OPERATION (%): -12.8		0,01147898		
NUMBER OF OPERATIONS/YEAR: 2.4	AVERAGE OPERATION DURATION (days): 88.6		0,003740546		
% OF POSITIVE OPERATIONS: 70.0	MAXIMUM OPERATION DURATION (days): 155		0,00763177		
% OF NEGATIVE OPERATIONS: 30.0	MINIMUM OPERATION DURATION (days): 21		0,111529282		
MAXIMUM PROFIT (%): +49.3	ACTIVE OPERATION TIME (%): 86.3		0,19879114		

Volatility 22,11%

There is not any operations for strategies 10-60 and 10-50.

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
	10-May-2016	08-Jun-2016	6,10%	0	6,10%	20	6,10%
BUY10							
SELL50							

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +6.1
PROFIT/YEAR (%): +1.5
COMPOUND PROFIT (%): +6.1
PASSIVE PROFIT (%): +35.1
NUMBER OF OPERATIONS: 1
NUMBER OF OPERATIONS/YEAR: 0.2
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +6.1
MINIMUM PROFIT (%): +6.1

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +6.1
MAXIMUM PROFIT/OPERATION (%): +6.1
MINIMUM PROFIT/OPERATION (%): +6.1
AVERAGE OPERATION DURATION (days): 20.0
MAXIMUM OPERATION DURATION (days): 20
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 21.3

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
03/02/2015	12/03/2015	-2,70%		-2,70%	26	-2,70%
21/05/2015	09/06/2015	0,30%		0,30%	12	-2,40%
19/06/2015	25/06/2015	4,50%		4,50%	4	2,10%
26/06/2015	16/07/2015	1,60%		1,60%	13	3,70%
11/08/2015	30/10/2015	-23,60%		-23,60%	57	-19,90%
12/12/2015	27/01/2016	5,60%		5,60%	29	-14,30%
30/01/2016	05/03/2016	3,70%		3,70%	24	-10,60%
25/05/2016	28/05/2016	2,30%		2,30%	3	-8,30%
11/06/2016	14/07/2016	9,20%		9,20%	22	0,90%
25/08/2016	17/11/2016	-1,60%	3,74%	2,14%	59	3,04%
21/01/2017	01/03/2017	1%	4,15%	5,15%	26	8,19%
13/04/2017	16/06/2017	3,90%	3,59%	7,49%	44	15,68%
22/07/2017	06/09/2017	-1,60%	3,32%	1,72%	31	17,40%
01/11/2017	30/01/2018	24,80%		24,80%	60	42,20%
07/03/2018	04/05/2018	-11,50%		-11,50%	41	30,70%
19/06/2018	11/08/2018	-3,90%	4,03%	0,13%	38	30,83%
15/09/2018	22/11/2018	-6,60%	4,63%	-1,97%	48	28,86%
08/01/2019	23/01/2019	-1,30%		-1,30%	110	27,56%
30/01/2019	27/02/2019	3,90%	5,32%	9,22%	20	36,78%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +7.8
PROFIT/YEAR (%): +1.9
COMPOUND PROFIT (%): -0.2
PASSIVE PROFIT (%): +29.3
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 4.7
% OF POSITIVE OPERATIONS: 57.9
% OF NEGATIVE OPERATIONS: 42.1
MAXIMUM PROFIT (%): +27.4
MINIMUM PROFIT (%): -20.0

MAXIMUM PROFIT STREAK (%): +47.3
MINIMUM PROFIT STREAK (%): -23.6
AVERAGE PROFIT/OPERATION (%): +0.4
MAXIMUM PROFIT/OPERATION (%): +24.8
MINIMUM PROFIT/OPERATION (%): -23.6
AVERAGE OPERATION DURATION (days): 29.8
MAXIMUM OPERATION DURATION (days): 60
MINIMUM OPERATION DURATION (days): 3
ACTIVE OPERATION TIME (%): 55.3

Volatility 18,01%

Average	(X-average)^2	Variance	Standard deviation
0,09986316	0,016094261	0,03243625	0,18010066
	0,015342082		
	0,006219398		
	0,003951777		
	0,089319187		
	0,058982513		
	0,04237964		
	0,033438935		
	0,008256113		
	0,00482513		
	0,000322675		
	0,003241804		
	0,005496271		
	0,103772145		
	0,042905671		
	0,043445917		
	0,035621596		
	0,030883438		
	0,071790151		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	16/04/2015	9,90%		9,90%	37	9,90%
09/06/2015	14/11/2015	-8,80%		-8,80%	112	1,10%
31/12/2015	06/04/2016	-6,30%		-6,30%	65	-5,20%
14/06/2016	10/08/2016	10,50%		10,50%	40	5,30%
25/08/2016	22/12/2016	0,40%	3,74%	4,14%	83	9,44%
20/01/2017	30/03/2017	5,30%	4,15%	9,45%	48	18,89%
12/04/2017	19/09/2017	19,50%	3,59%	23,09%	110	41,98%
18/11/2017	06/03/2018	14,70%		14,70%	71	56,68%
08/03/2018	30/05/2018	-5,20%		-5,20%	57	51,48%
28/06/2018	27/12/2018	-7,60%	8,66%	1,06%	125	52,54%
10/01/2019	27/02/2019	-11,20%	5,32%	-5,88%	33	46,66%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +21.1
PROFIT/YEAR (%): +5.3
COMPOUND PROFIT (%): +16.9
PASSIVE PROFIT (%): +33.7
NUMBER OF OPERATIONS: 11
NUMBER OF OPERATIONS/YEAR: 2.7
% OF POSITIVE OPERATIONS: 54.5
% OF NEGATIVE OPERATIONS: 45.5
MAXIMUM PROFIT (%): +45.1
MINIMUM PROFIT (%): -5.2

MAXIMUM PROFIT STREAK (%): +50.3
MINIMUM PROFIT STREAK (%): -23.9
AVERAGE PROFIT/OPERATION (%): +1.9
MAXIMUM PROFIT/OPERATION (%): +19.5
MINIMUM PROFIT/OPERATION (%): -11.2
AVERAGE OPERATION DURATION (days): 71.0
MAXIMUM OPERATION DURATION (days): 125
MINIMUM OPERATION DURATION (days): 33
ACTIVE OPERATION TIME (%): 77.2

Volatility 22,53%

Average	(X-average)^2	Variance	Standard deviation
0,26251818	0,026738196	0,05074817	0,225273542
	0,063261396		
	0,098921687		
	0,043897869		
	0,028263723		
	0,005419637		
	0,02473757		
	0,092587425		
	0,063646116		
	0,06910685		
	0,041649389		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30/07/2015	07/08/2015	-1,80%		-1,80%	6	-1,80%
26/09/2015	12/05/2016	6,90%	3,74%	10,64%	157	8,84%
07/02/2017	03/06/2017	4,80%	4,15%	8,95%	81	17,79%
02/08/2017	12/09/2017	18,10%	3,59%	21,69%	28	39,48%
02/05/2018	27/02/2019	-18%	13,98%	-4,02%	207	35,46%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): +9.9
PROFIT/YEAR (%): +2.8
COMPOUND PROFIT (%): +6.5
PASSIVE PROFIT (%): +7.9
NUMBER OF OPERATIONS: 5
NUMBER OF OPERATIONS/YEAR: 1.4
% OF POSITIVE OPERATIONS: 60.0
% OF NEGATIVE OPERATIONS: 40.0
MAXIMUM PROFIT (%): +28.0
MINIMUM PROFIT (%): -1.8

MAXIMUM PROFIT STREAK (%): +29.7
MINIMUM PROFIT STREAK (%): -18.0
AVERAGE PROFIT/OPERATION (%): +2.0
MAXIMUM PROFIT/OPERATION (%): +18.1
MINIMUM PROFIT/OPERATION (%): -18.0
AVERAGE OPERATION DURATION (days): 95.8
MAXIMUM OPERATION DURATION (days): 207
MINIMUM OPERATION DURATION (days): 6
ACTIVE OPERATION TIME (%): 53.1

Volatility 15,64%

22,53	(X-average)^2	Variance	Standard deviation
0,19954	0,047323652	0,02446282	0,156405954
	0,0123521		
	0,00046829		
	0,038126468		
	0,024043604		

Merk and Co.

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	12/02/2015	03/06/2015	3,40%		3,40%	76	3,40%
BUY 30	17/06/2015	21/07/2015	5,90%		5,90%	23	9,30%
SELL 70	22/08/2015	30/10/2015	-1,70%		-1,70%	48	7,60%
	17/02/2016	16/03/2016	5,60%		5,60%	20	13,20%
	04/05/2016	02/06/2016	3,80%		3,80%	20	17,00%
	29/07/2016	18/11/2016	10,50%	2,97%	13,47%	79	30,47%
	07/12/2016	09/02/2017	5,50%	2,84%	8,34%	43	38,81%
	17/03/2017	14/09/2017	-9,30%	2,95%	-6,35%	125	32,46%
	21/10/2017	14/12/2017	-11,70%		-11,70%	37	20,76%
	04/01/2018	18/04/2018	2,30%	6,38%	8,68%	71	29,44%
	07/09/2018	05/10/2018	3%	2,66%	5,66%	20	35,10%
	22/12/2018	14/02/2019	8,50%	3,02%	11,52%	35	46,62%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +25.7
PROFIT/YEAR (%): +6.3
COMPOUND PROFIT (%): +25.8
PASSIVE PROFIT (%): +33.5
NUMBER OF OPERATIONS: 12
NUMBER OF OPERATIONS/YEAR: 2.9
% OF POSITIVE OPERATIONS: 75.0
% OF NEGATIVE OPERATIONS: 25.0
MAXIMUM PROFIT (%): +32.8

Volatility 6,97%

MAXIMUM PROFIT STREAK (%): +29.4
MINIMUM PROFIT STREAK (%): -21.0
AVERAGE PROFIT/OPERATION (%): +2.1
MAXIMUM PROFIT/OPERATION (%): +10.5
MINIMUM PROFIT/OPERATION (%): -11.7
AVERAGE OPERATION DURATION (days): 49.8
MAXIMUM OPERATION DURATION (days): 125
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 58.2
MINIMUM PROFIT (%): +3.4

Average	(X-average)^2	Variance	Standard deviation
0,03885	2,35225E-05	0,00485199	0,069656221
	0,000406023		
	0,003119223		
	0,000294123		
	7,225E-07		
	0,009187223		
	0,001984703		
	0,010475523		
	0,024289223		
	0,002299203		
	0,000315063		
	0,005829323		

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	10/02/2015	22/07/2015	3,10%		3,10%	112	3,10%
BUY35	22/08/2015	03/11/2015	-2,40%		-2,40%	50	0,70%
SELL80	05/02/2016	05/03/2016	5,70%		5,70%	20	6,40%
	04/05/2016	04/06/2016	5,30%		5,30%	22	11,70%
	29/07/2016	15/02/2017	14,70%	5,81%	20,51%	138	32,21%
	15/03/2017	19/09/2017	-9,60%	5,95%	-3,65%	130	28,56%
	17/10/2017	19/01/2018	-6,90%	3,13%	-3,77%	64	24,79%
	06/02/2018	25/04/2018	3,70%	3,25%	6,95%	54	31,74%
	07/09/2018	15/02/2019	17%	5,68%	22,68%	110	54,42%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +30.8
PROFIT/YEAR (%): +7.6
COMPOUND PROFIT (%): +31.4
PASSIVE PROFIT (%): +34.0
NUMBER OF OPERATIONS: 9
NUMBER OF OPERATIONS/YEAR: 2.2
% OF POSITIVE OPERATIONS: 66.7
% OF NEGATIVE OPERATIONS: 33.3
MAXIMUM PROFIT (%): +30.8
Volatility 9,18%

MAXIMUM PROFIT STREAK (%): +30.0
MINIMUM PROFIT STREAK (%): -2.4
AVERAGE PROFIT/OPERATION (%): +3.4
MAXIMUM PROFIT/OPERATION (%): +17.0
MINIMUM PROFIT/OPERATION (%): -9.6
AVERAGE OPERATION DURATION (days): 77.8
MAXIMUM OPERATION DURATION (days): 138
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 68.3
MINIMUM PROFIT (%): +0.7

Average	(X-average)^2	Variance	Standard deviation
0,06046667	0,000868284	0,00841968	0,09175879
	0,007134618		
	1,20178E-05		
	5,57511E-05		
	0,020918801		
	0,009402534		
	0,009636694		
	8,16011E-05		
	0,027666778		

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	14/02/2015	22/07/2015	3,40%		3,40%	108	3,40%
BUY25	26/08/2015	03/11/2015	2,50%		2,50%	48	5,90%
SELL80	05/05/2016	04/06/2016	6,10%		6,10%	21	12,00%
	30/07/2016	15/02/2017	13,80%	5,81%	19,61%	137	31,61%
	21/03/2017	19/09/2017	-8,60%	5,95%	-2,65%	126	28,96%
	26/10/2017	19/01/2018	-6,10%	3,13%	-2,97%	57	25,99%
	06/02/2018	25/04/2018	3,70%	3,25%	6,95%	54	32,94%
	22/12/2018	15/02/2019	9%	3,02%	12,02%	36	44,96%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +23.9
PROFIT/YEAR (%): +5.9
COMPOUND PROFIT (%): +24.2
PASSIVE PROFIT (%): +34.3
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 75.0
% OF NEGATIVE OPERATIONS: 25.0
MAXIMUM PROFIT (%): +25.8
Volatility 7,03%

MAXIMUM PROFIT STREAK (%): +22.4
MINIMUM PROFIT STREAK (%): -14.7
AVERAGE PROFIT/OPERATION (%): +3.0
MAXIMUM PROFIT/OPERATION (%): +13.8
MINIMUM PROFIT/OPERATION (%): -8.6
AVERAGE OPERATION DURATION (days): 73.4
MAXIMUM OPERATION DURATION (days): 137
MINIMUM OPERATION DURATION (days): 21
ACTIVE OPERATION TIME (%): 57.3
MINIMUM PROFIT (%): +3.4

Average	(X-average)^2	Variance	Standard deviation
0,0562	0,00049284	0,00494404	0,070313868
	0,00097344		
	0,00002304		
	0,01957201		
	0,00683929		
	0,00737881		
	0,00017689		
	0,004096		

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	19/06/2015	21/07/2015	5,80%		5,80%	21	5,80%
BUY20	26/08/2015	27/10/2015	-1,80%		-1,80%	43	4,00%
SELL65	05/05/2016	03/06/2016	5,30%		5,30%	20	9,30%
	03/08/2016	18/11/2016	11,50%	2,97%	14,47%	76	23,77%
	23/03/2017	13/05/2017	-1,10%	2,95%	1,85%	36	25,62%
	13/07/2017	13/09/2017	-1,90%		-1,90%	43	23,72%
	27/10/2017	14/12/2017	-11,10%		-11,10%	33	12,62%
	07/02/2018	14/04/2018	3%	3,25%	6,25%	46	18,87%
	27/02/2018	05/02/2019	5,30%	12%	17,30%	26	36,17%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +15.1
PROFIT/YEAR (%): +3.7
COMPOUND PROFIT (%): +14.2
PASSIVE PROFIT (%): +36.2
NUMBER OF OPERATIONS: 9
NUMBER OF OPERATIONS/YEAR: 2.2
% OF POSITIVE OPERATIONS: 55.6
% OF NEGATIVE OPERATIONS: 44.4
MAXIMUM PROFIT (%): +20.9

MAXIMUM PROFIT STREAK (%): +16.8
MINIMUM PROFIT STREAK (%): -14.1
AVERAGE PROFIT/OPERATION (%): +1.7
MAXIMUM PROFIT/OPERATION (%): +11.5
MINIMUM PROFIT/OPERATION (%): -11.1
AVERAGE OPERATION DURATION (days): 38.2
MAXIMUM OPERATION DURATION (days): 76
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 33.6
MINIMUM PROFIT (%): +4.1

Average	(X-average)^2	Variance	Standard deviation
0,04018889	0,000317236	0,00663981	0,081485015
	0,003385947		
	0,000164125		
	0,010922572		
	0,000470408		
	0,003503325		
	0,02285808		
	0,000497786		
	0,017638791		

Volatility 8,15%

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	06/02/2015	16/07/2016	3,20%	3,13%	6,33%	363	6,33%
BUY45	29/07/2016	17/08/2018	11,60%	24,66%	36,26%	517	42,59%
SELL90	06/09/2018	15/02/2019	18,70%	5,68%	24,38%	112	66,97%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +33.5
PROFIT/YEAR (%): +8.2
COMPOUND PROFIT (%): +36.7
PASSIVE PROFIT (%): +34.3
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +33.5

MAXIMUM PROFIT STREAK (%): +30.3
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +11.2
MAXIMUM PROFIT/OPERATION (%): +18.7
MINIMUM PROFIT/OPERATION (%): +3.2
AVERAGE OPERATION DURATION (days): 330.7
MAXIMUM OPERATION DURATION (days): 517
MINIMUM OPERATION DURATION (days): 112
ACTIVE OPERATION TIME (%): 96.8
MINIMUM PROFIT (%): +3.2

Average	(X-average)^2	Variance	Standard deviation
0,22323333	0,025578671	0,01514158	0,12305111
	0,019423068		
	0,000422988		

Volatility 12,31%

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	03/02/2015	04/03/2016	-11,70%		-11,70%	273	-11,70%
BUY55	18/03/2016	16/07/2016	16,40%		16,40%	83	4,70%
SELL85	27/07/2016	16/02/2017	13,50%	2,97%	16,47%	141	21,17%
	14/03/2017	27/04/2018	-20,30%	12,33%	-7,97%	283	13,20%
	08/05/2018	09/08/2018	17,30%		17,30%	65	30,50%
	01/09/2018	16/02/2019	19,40%	5,68%	25,08%	114	55,58%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +34.6
PROFIT/YEAR (%): +8.5
COMPOUND PROFIT (%): +30.2
PASSIVE PROFIT (%): +30.0
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.5
% OF POSITIVE OPERATIONS: 66.7
% OF NEGATIVE OPERATIONS: 33.3
MAXIMUM PROFIT (%): +34.6

MINIMUM PROFIT (%): -11.7
MAXIMUM PROFIT STREAK (%): +46.2
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +5.8
MAXIMUM PROFIT/OPERATION (%): +19.4
MINIMUM PROFIT/OPERATION (%): -20.3
AVERAGE OPERATION DURATION (days): 159.8
MAXIMUM OPERATION DURATION (days): 283
MINIMUM OPERATION DURATION (days): 65
ACTIVE OPERATION TIME (%): 93.4

Volatility 21,04%

Average	(X-average)^2	Variance	Standard deviation
0,18908333	0,093687007	0,04426041	0,210381593
	0,020187674		
	0,000511514		
	0,003258507		
	0,013436674		
	0,134481114		

There is not any operation for strategies 10-60 and 10-50.

Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
18/03/2015	3,20%		3,20%	20	3,20%
06/05/2015	-0,20%		-0,20%	7	3,00%
29/05/2015	1,20%		1,20%	11	4,20%
17/07/2015	2,00%		2,00%	26	6,20%
22/10/2015	-12,20%		-12,20%	42	-6,00%
03/03/2016	-2,90%		-2,90%	55	-8,90%
04/06/2016	5,40%		5,40%	17	-3,50%
07/07/2016	3,10%		3,10%	4	-0,40%
09/08/2016	7,80%		7,80%	1	7,40%
19/11/2016	5,80%	2,97%	8,77%	49	16,17%
07/02/2017	-2,10%	2,84%	0,74%	33	16,91%
27/05/2017	-3,90%		-3,90%	48	13,01%
22/06/2017	0,70%		0,70%	6	13,71%
29/08/2017	-6,50%	2,95%	-3,55%	37	10,16%
14/12/2017	-11,70%		-11,70%	37	-1,54%
21/03/2018	-1,00%	6,38%	5,38%	24	3,84%
03/08/2018	7,40%		7,40%	22	11,24%
10/11/2018	10,20%	2,66%	12,86%	41	24,10%
13/02/2019	1,60%	3,02%	4,62%	37	28,72%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +7.9
PROFIT/YEAR (%): +1.9
COMPOUND PROFIT (%): +4.5
PASSIVE PROFIT (%): +36.6
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 4.7
% OF POSITIVE OPERATIONS: 57.9
% OF NEGATIVE OPERATIONS: 42.1
MAXIMUM PROFIT (%): +13.3
MINIMUM PROFIT (%): -11.3

MAXIMUM PROFIT STREAK (%): +22.1
MINIMUM PROFIT STREAK (%): -24.6
AVERAGE PROFIT/OPERATION (%): +0.4
MAXIMUM PROFIT/OPERATION (%): +10.2
MINIMUM PROFIT/OPERATION (%): -12.2
AVERAGE OPERATION DURATION (days): 27.2
MAXIMUM OPERATION DURATION (days): 55
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 50.4

Volatility 9,63%

Average	(X-average)^2	Variance	Standard deviation
7,45%	0,001804908	0,00926616	0,09626087
	0,001978845		
	0,001055224		
	0,000155856		
	0,018086003		
	0,026727087		
	0,011986792		
	0,006159771		
	2,3446E-07		
	0,007606594		
	0,008952148		
	0,003093116		
	0,003920737		
	0,000735266		
	0,008079171		
	0,00130207		
	0,001437607		
	0,027727508		
	0,045248007		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	10/11/2015	-2,80%		-2,80%	182	-2,80%
29/12/2015	01/04/2016	-4,00%		-4,00%	64	-6,80%
11/05/2016	14/07/2016	11,50%		11,50%	44	4,70%
19/07/2016	13/08/2016	5,40%	2,97%	8,37%	19	13,07%
26/08/2016	14/03/2017	9,00%	2,84%	11,84%	136	24,91%
15/03/2017	07/10/2017	-9,60%	2,95%	-6,65%	144	18,26%
25/10/2017	18/01/2018	-6,00%		-6,00%	57	12,26%
14/02/2018	24/04/2018	9,00%	6,38%	15,38%	47	27,64%
12/07/2018	22/08/2018	13,00%		13,00%	29	40,64%
07/09/2018	08/09/2018	-0,70%		-0,70%	1	39,94%
13/09/2018	27/02/2019	17,80%	5,68%	23,48%	114	63,42%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +42.4
PROFIT/YEAR (%): +10.5
COMPOUND PROFIT (%): +46.1
PASSIVE PROFIT (%): +37.5
NUMBER OF OPERATIONS: 11
NUMBER OF OPERATIONS/YEAR: 2.7
% OF POSITIVE OPERATIONS: 54.5
% OF NEGATIVE OPERATIONS: 45.5
MAXIMUM PROFIT (%): +42.4
MINIMUM PROFIT (%): -6.9

MAXIMUM PROFIT STREAK (%): +49.3
MINIMUM PROFIT STREAK (%): -4.0
AVERAGE PROFIT/OPERATION (%): +3.9
MAXIMUM PROFIT/OPERATION (%): +17.8
MINIMUM PROFIT/OPERATION (%): -9.6
AVERAGE OPERATION DURATION (days): 76.1
MAXIMUM OPERATION DURATION (days): 182
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 82.7

Volatility 19,89%

Average	(X-average)^2	Variance	Standard deviation
21,39%	0,058493621	0,03957639	0,19893816
	0,079441985		
	0,027840439		
	0,006914678		
	0,001242242		
	0,000976847		
	0,008327392		
	0,003911934		
	0,037073752		
	0,034427116		
	0,176690301		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
18/02/2015	18/03/2015	3,20%		3,20%	20	3,20%
25/04/2015	06/05/2015	-0,20%		-0,20%	7	3,00%
13/05/2015	29/05/2015	1,20%		1,20%	11	4,20%
10/06/2015	17/07/2015	2,00%		2,00%	26	6,20%
22/08/2015	22/10/2015	-12,20%		-12,20%	42	-6,00%
11/12/2015	03/03/2016	-2,90%		-2,90%	55	-8,90%
11/05/2016	04/06/2016	5,40%		5,40%	17	-3,50%
30/06/2016	07/07/2016	3,10%		3,10%	4	-0,40%
06/08/2016	09/08/2016	7,80%		7,80%	1	7,40%
13/09/2016	19/11/2016	5,80%		5,80%	49	13,20%
17/12/2016	07/02/2017	-2,10%		-2,10%	33	11,10%
21/03/2017	27/05/2017	-3,90%		-3,90%	48	7,20%
14/06/2017	22/06/2017	0,70%		0,70%	6	7,90%
07/07/2017	29/08/2017	-6,50%		-6,50%	37	1,40%
21/10/2017	14/12/2017	-11,70%		-11,70%	37	-10,30%
14/02/2018	21/03/2018	-1,00%		-1,00%	24	-11,30%
03/07/2018	03/08/2018	7,40%		7,40%	22	-3,90%
14/09/2018	10/11/2018	10,20%		10,20%	41	6,30%
19/12/2018	13/02/2019	1,60%		1,60%	37	7,90%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +7.9
PROFIT/YEAR (%): +1.9
COMPOUND PROFIT (%): +4.5
PASSIVE PROFIT (%): +36.6
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 4.7
% OF POSITIVE OPERATIONS: 57.9
% OF NEGATIVE OPERATIONS: 42.1
MAXIMUM PROFIT (%): +13.3
MINIMUM PROFIT (%): -11.3

MAXIMUM PROFIT STREAK (%): +22.1
MINIMUM PROFIT STREAK (%): -24.6
AVERAGE PROFIT/OPERATION (%): +0.4
MAXIMUM PROFIT/OPERATION (%): +10.2
MINIMUM PROFIT/OPERATION (%): -12.2
AVERAGE OPERATION DURATION (days): 27.2
MAXIMUM OPERATION DURATION (days): 55
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 50.4

Volatility 7,10%

Average	(X-average)^2	Variance	Standard deviation
1,83%	0,000188701	0,00504777	0,07104768
	0,000137753		
	0,000563438		
	0,001912911		
	0,006125122		
	0,011505385		
	0,002836964		
	0,000495648		
	0,003106596		
	0,012936069		
	0,008600122		
	0,002887648		
	0,003688964		
	1,81745E-05		
	0,014704753		
	0,017230017		
	0,003279069		
	0,002001385		
	0,003688964		

Kraft Heinz Company

	Buy dates	Salwe dates	Performance	Div.	Prfm. Div.	Days of position	Cumulative performance
RSI14	20/08/2015	17/10/2015	-2,30%		-2,30%	41	-2,30%
BUY 70	18/11/2015	01/03/2016	3,80%		3,80%	69	1,50%
SELL 30	22/03/2016	10/05/2016	6,70%		6,70%	34	8,20%
	05/08/2016	26/10/2016	6,20%	2,72%	8,92%	57	17,12%
	08/11/2016	21/12/2016	6,60%	2,65%	9,25%	30	26,37%
	11/03/2017	18/04/2017	-1,90%	2,68%	0,78%	25	27,15%
	28/04/2017	07/06/2017	-1,90%		-1,90%	27	25,25%
	23/06/2017	29/07/2017	-7,40%		-7,40%	25	17,85%
	26/08/2017	10/11/2017	-4,60%	3,32%	-1,28%	53	16,57%
	22/12/2017	15/05/2018	-25,20%	4,43%	-20,77%	97	-4,20%
	26/07/2018	16/01/2019	-20,70%	9,60%	-11,10%	119	-15,30%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 3.6	MAXIMUM PROFIT STREAK (%): +23.2	0,10746364	0,01702076	0,01829569	0,135261567
TOTAL PROFIT (%): -40.8	MINIMUM PROFIT STREAK (%): -61.7		0,008549524		
PROFIT/YEAR (%): -11.4	AVERAGE PROFIT/OPERATION (%): -3.7		0,000648397		
COMPOUND PROFIT (%): -38.3	MAXIMUM PROFIT/OPERATION (%): +6.7		0,004062324		
PASSIVE PROFIT (%): -38.9	MINIMUM PROFIT/OPERATION (%): -25.2		0,024409801		
NUMBER OF OPERATIONS: 11	AVERAGE OPERATION DURATION (days): 52.5		0,026907929		
NUMBER OF OPERATIONS/YEAR: 3.1	MAXIMUM OPERATION DURATION (days): 119		0,021035547		
% OF POSITIVE OPERATIONS: 36.4	MINIMUM OPERATION DURATION (days): 25		0,005046165		
% OF NEGATIVE OPERATIONS: 63.6	ACTIVE OPERATION TIME (%): 64.3		0,003391474		
MAXIMUM PROFIT (%): +20.9	**MINIMUM PROFIT (%): -40.8**		0,022339379		
			0,067841306		

Volatiliy 13,53%

	Buy dates	Salwe dates	Performance	Div.	Prfm. Div.	Days of position	Cumulative performance
RSI14	20/08/2015	20/10/2015	-0,40%		-0,40%	42	-0,40%
BUY35	12/11/2015	01/03/2016	4,10%		4,10%	73	3,70%
SELL80	22/03/2016	12/05/2016	8,80%		8,80%	36	12,50%
	29/07/2016	22/12/2016	5,60%	5,37%	10,97%	102	23,47%
	11/03/2017	23/01/2019	-52,60%	30,50%	-22,10%	469	1,37%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 3.6	MAXIMUM PROFIT STREAK (%): +18.5	0,08128	0,007272678	0,00784992	0,088599761
TOTAL PROFIT (%): -34.5	MINIMUM PROFIT STREAK (%): -52.6		0,001960718		
PROFIT/YEAR (%): -9.7	AVERAGE PROFIT/OPERATION (%): -6.9		0,001911438		
COMPOUND PROFIT (%): -43.6	MAXIMUM PROFIT/OPERATION (%): +8.8		0,023537696		
PASSIVE PROFIT (%): -38.9	MINIMUM PROFIT/OPERATION (%): -52.6		0,004567056		
NUMBER OF OPERATIONS: 5	AVERAGE OPERATION DURATION (days): 144.4				
NUMBER OF OPERATIONS/YEAR: 1.4	MAXIMUM OPERATION DURATION (days): 469				
% OF POSITIVE OPERATIONS: 60.0	MINIMUM OPERATION DURATION (days): 36				
% OF NEGATIVE OPERATIONS: 40.0	ACTIVE OPERATION TIME (%): 80.4				
MAXIMUM PROFIT (%): +18.1	**MINIMUM PROFIT (%): -34.5**				

Volatiliy 8,86%

	Buy dates	Salwe dates	Performance	Div.	Prfm. Div.	Days of position	Cumulative performance
RSI14	22/08/2015	22/09/2015	3,30%		3,30%	20	3,30%
BUY10	07/07/2017	20/09/2017	-8%	3,32%	-4,68%	52	-1,38%
SELL50	07/02/2018	13/04/2018	-17,30%	4,43%	-12,87%	45	-14,25%
	25/12/2018	25/01/2019	5,60%		5,60%	20	-8,65%

Average	(X-average)^2	Variance	Standard deviation
-0,05245	0,007301703	0,00451598	0,06720106
	0,001493823		
	0,008109003		
	0,001159403		

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): -16.5
PROFIT/YEAR (%): -4.6
COMPOUND PROFIT (%): -17.1
PASSIVE PROFIT (%): -36.8
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.1
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +3.3
Volatiliy 6,72%

MAXIMUM PROFIT STREAK (%): +5.6
MINIMUM PROFIT STREAK (%): -25.3
AVERAGE PROFIT/OPERATION (%): -4.1
MAXIMUM PROFIT/OPERATION (%): +5.6
MINIMUM PROFIT/OPERATION (%): -17.3
AVERAGE OPERATION DURATION (days): 34.2
MAXIMUM OPERATION DURATION (days): 52
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 15.3
MINIMUM PROFIT (%): -22.0

	Buy dates	Salwe dates	Performance	Div.	Prfm. Div.	Days of position	Cumulative performance
RSI14	21/08/2015	23/09/2015	0,20%		0,20%	22	0,20%
BUY20	04/05/2017	06/06/2017	-0,70%		-0,70%	22	-0,50%
SELL65	29/06/2017	28/07/2017	-4,30%		-4,30%	20	-4,80%
	02/09/2017	09/11/2017	-1%	3,32%	2,32%	47	-2,48%
	07/02/2018	15/05/2018	-17,60%	4,43%	-13,17%	67	-15,65%
	27/07/2018	16/01/2019	-22,60%	9,60%	-13,00%	118	-28,65%

Average	(X-average)^2	Variance	Standard deviation
-0,0864667	0,007826351	0,01077727	0,103813642
	0,006636818		
	0,001479684		
	0,003802778		
	0,004904668		
	0,040013334		

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): -45.9
PROFIT/YEAR (%): -12.9
COMPOUND PROFIT (%): -39.8
PASSIVE PROFIT (%): -37.4
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 16.7
% OF NEGATIVE OPERATIONS: 83.3
MAXIMUM PROFIT (%): +0.2

Volatiliy 10,38%

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -46.1
AVERAGE PROFIT/OPERATION (%): -7.6
MAXIMUM PROFIT/OPERATION (%): +0.2
MINIMUM PROFIT/OPERATION (%): -22.6
AVERAGE OPERATION DURATION (days): 49.3
MAXIMUM OPERATION DURATION (days): 118
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 33.0
MINIMUM PROFIT (%): -45.9

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
20-Aug-2015	23-Sep-2015	-2,20%		-2,20%	23	-2,20%
06-Oct-2015	17-Oct-2015	2,50%		2,50%	9	0,30%
12-Nov-2015	28-Nov-2015	3,10%		3,10%	11	3,40%
11-Dec-2015	31-Dec-2015	4,50%		4,50%	13	7,90%
15-Jan-2016	04-Feb-2016	4,40%		4,40%	13	12,30%
12-Feb-2016	01-Mar-2016	12,30%		12,30%	11	24,60%
19-Mar-2016	28-Apr-2016	0,00%		0,00%	27	24,60%
24-Jun-2016	07-Jul-2016	4,20%		4,20%	8	28,80%
28-Jul-2016	23-Aug-2016	-0,40%		-0,40%	18	28,40%
27-Aug-2016	30-Sep-2016	-0,20%		-0,20%	23	28,20%
05-Nov-2016	21-Dec-2016	11,40%		11,40%	31	39,60%
10-Jan-2017	28-Jan-2017	1,20%	2,65%	3,85%	13	43,45%
11-Mar-2017	18-Apr-2017	-1,90%		-1,90%	25	41,55%
27-Apr-2017	07-Jun-2017	-3,00%		-3,00%	28	38,55%
16-Jun-2017	27-Jul-2017	-9,80%		-9,80%	28	28,75%
04-Aug-2017	09-Nov-2017	-8,30%		-8,30%	68	20,45%
30-Nov-2017	15-May-2018	-26,30%	3,32%	-22,98%	113	-2,53%
21-Jul-2018	01-Nov-2018	-7,70%		-7,70%	72	-10,23%
06-Nov-2018	16-Jan-2019	-9,70%	9,60%	-0,10%	47	-10,33%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): -25.7
PROFIT/YEAR (%): -7.2
COMPOUND PROFIT (%): -28.4
PASSIVE PROFIT (%): -38.9
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 5.3
% OF POSITIVE OPERATIONS: 42.1
% OF NEGATIVE OPERATIONS: 57.9
MAXIMUM PROFIT (%): +41.0
MINIMUM PROFIT (%): -25.7

MAXIMUM PROFIT STREAK (%): +43.1
MINIMUM PROFIT STREAK (%): -66.7
AVERAGE PROFIT/OPERATION (%): -1.4
MAXIMUM PROFIT/OPERATION (%): +12.3
MINIMUM PROFIT/OPERATION (%): -26.3
AVERAGE OPERATION DURATION (days): 30.6
MAXIMUM OPERATION DURATION (days): 113
MINIMUM OPERATION DURATION (days): 8
ACTIVE OPERATION TIME (%): 64.7

Volatility 17,82%

BUY25
SELL80

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
31-Jul-2015	04-Mar-2016 1	-2,30%		-2,30%	149	-2,30%
18-Mar-2016	24-Dec-2016	20,70%	2,65%	23,35%	196	21,05%
07-Jan-2017	23-Jan-2019 5	-49,40%	14,03%	-35,37%	512	-14,32%

BUY55
SELL85

NUMBER OF YEARS: 3.5
TOTAL PROFIT (%): -30.9
PROFIT/YEAR (%): -8.8
COMPOUND PROFIT (%): -40.3
PASSIVE PROFIT (%): -43.7
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.9
% OF POSITIVE OPERATIONS: 33.3
% OF NEGATIVE OPERATIONS: 66.7
MAXIMUM PROFIT (%): +18.5
MINIMUM PROFIT (%): -30.9

MAXIMUM PROFIT STREAK (%): +20.7
MINIMUM PROFIT STREAK (%): -49.4
AVERAGE PROFIT/OPERATION (%): -10.3
MAXIMUM PROFIT/OPERATION (%): +20.7
MINIMUM PROFIT/OPERATION (%): -49.4
AVERAGE OPERATION DURATION (days): 285.7
MAXIMUM OPERATION DURATION (days): 512
MINIMUM OPERATION DURATION (days): 149
ACTIVE OPERATION TIME (%): 96.7

Volatility 17,98%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
11-Aug-2015	24-Dec-2016	14,70%	5,37%	20,07%	348	20,07%
10-Jan-2017	30-Jan-2019 !	-50,70%	10,35%	-40,35%	517	-20,28%

BUY45
SELL90

NUMBER OF YEARS: 3.5
TOTAL PROFIT (%): -35.9
PROFIT/YEAR (%): -10.2
COMPOUND PROFIT (%): -43.4
PASSIVE PROFIT (%): -44.1
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.6
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +14.7
MINIMUM PROFIT (%): -35.9

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -50.7
AVERAGE PROFIT/OPERATION (%): -18.0
MAXIMUM PROFIT/OPERATION (%): +14.7
MINIMUM PROFIT/OPERATION (%): -50.7
AVERAGE OPERATION DURATION (days): 432.5
MAXIMUM OPERATION DURATION (days): 517
MINIMUM OPERATION DURATION (days): 348
ACTIVE OPERATION TIME (%): 97.6

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
22-Aug-2015	23-Sep-2015	1,20%		1,20%	21	1,20%
07-Jul-2017	09-Nov-2017	-8,00%		-8,00%	88	-6,80%
07-Feb-2018	11-May-2018	-18,30%		-18,30%	65	-25,10%
25-Dec-2018	25-Jan-2019 :	5,60%		5,60%	20	-19,50%

BUY10
SELL60

NUMBER OF YEARS: 3.5
TOTAL PROFIT (%): -19.6
PROFIT/YEAR (%): -5.5
COMPOUND PROFIT (%): -19.7
PASSIVE PROFIT (%): -38.2
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.1
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +1.2
MINIMUM PROFIT (%): -25.1

MAXIMUM PROFIT STREAK (%): +5.6
MINIMUM PROFIT STREAK (%): -26.3
AVERAGE PROFIT/OPERATION (%): -4.9
MAXIMUM PROFIT/OPERATION (%): +5.6
MINIMUM PROFIT/OPERATION (%): -18.3
AVERAGE OPERATION DURATION (days): 48.5
MAXIMUM OPERATION DURATION (days): 88
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 21.9

Volatility 11,94%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
03-Feb-2015	02-Apr-201	7,50%		7,50%	41	7,50%
17-Apr-2015	12-May-20	-4,70%		-4,70%	17	2,80%
23-Jul-2015	24-Jul-2015	-2,70%		-2,70%	1	0,10%
24-Sep-2015	08-Dec-20:	24,60%		24,60%	51	24,70%
01-Mar-2016	14-Apr-20	0,60%		0,60%	32	25,30%
19-Apr-2016	20-Apr-201	-0,70%		-0,70%	1	24,60%
10-Jun-2016	09-Aug-20:	4,90%		4,90%	41	29,50%
26-Oct-2016	10-Jan-201	11,40%		11,40%	51	40,90%
04-Mar-2017	23-Mar-20	-5,60%		-5,60%	13	35,30%
14-Apr-2017	03-May-20	-6,20%	3,47%	-2,73%	12	32,57%
20-Jun-2017	12-Jul-201	-13,70%		-13,70%	15	18,87%
01-Sep-2017	14-Sep-201	-2,80%		-2,80%	8	16,07%
15-Sep-2017	27-Oct-201	-9,30%		-9,30%	30	6,77%
20-Dec-2017	02-Feb-20:	-15,50%	2,71%	-12,79%	29	-6,02%
10-Mar-2018	14-Jun-20	-1,10%		-1,10%	66	-7,12%
20-Jul-2018	31-Jul-2018	-6,40%		-6,40%	7	-13,52%
19-Sep-2018	27-Sep-201	-12,70%		-12,70%	6	-26,22%
09-Oct-2018	02-Nov-20	-26,40%		-26,40%	18	-52,62%
27-Dec-2018	27-Feb-20:	57,20%		57,20%	42	4,58%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -1.4
PROFIT/YEAR (%): -0.4
COMPOUND PROFIT (%): -22.7
PASSIVE PROFIT (%): -55.0
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 4.7
% OF POSITIVE OPERATIONS: 31.6
% OF NEGATIVE OPERATIONS: 68.4
MAXIMUM PROFIT (%): +41.0
MINIMUM PROFIT (%): -58.6

MAXIMUM PROFIT STREAK (%): +57.2
MINIMUM PROFIT STREAK (%): -99.6
AVERAGE PROFIT/OPERATION (%): -0.1
MAXIMUM PROFIT/OPERATION (%): +57.2
MINIMUM PROFIT/OPERATION (%): -26.4
AVERAGE OPERATION DURATION (days): 25.3
MAXIMUM OPERATION DURATION (days): 66
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 46.9

Volatility 22,66%

Average	(X-average)^2	Variance	ndard deviation
8,63%	0,000128763	0,051368	0,226646
	0,003404415		
	0,007284173		
	0,025809268		
	0,0277731		
	0,025488963		
	0,043535921		
	0,104104721		
	0,071103626		
	0,057289682		
	0,010476061		
	0,005528314		
	0,000347724		
	0,021476131		
	0,024821173		
	0,049083236		
	0,121485268		
	0,375214279		
	0,001644089		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
04-Mar-2015	30-Apr-20	3,10%		3,10%	40	3,10%
16-Oct-2015	24-Dec-20:	13,40%		13,40%	48	16,50%
05-Apr-2016	08-Apr-201	-3,90%		-3,90%	3	12,60%
16-Jul-2016	10-Aug-201	-5,80%		-5,80%	17	6,80%
24-Nov-2016	20-Jan-20:	-2,00%	2,71%	0,71%	37	7,51%
21-Apr-2018	04-Jul-201:	-6,40%		-6,40%	51	1,11%
17-Jan-2019	27-Feb-201	26,30%		26,30%	28	27,41%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +24.7
PROFIT/YEAR (%): +6.1
COMPOUND PROFIT (%): +22.6
PASSIVE PROFIT (%): -59.2
NUMBER OF OPERATIONS: 7
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 42.9
% OF NEGATIVE OPERATIONS: 57.1
MAXIMUM PROFIT (%): +24.7
MINIMUM PROFIT (%): -1.6

MAXIMUM PROFIT STREAK (%): +26.3
MINIMUM PROFIT STREAK (%): -18.1
AVERAGE PROFIT/OPERATION (%): +3.5
MAXIMUM PROFIT/OPERATION (%): +26.3
MINIMUM PROFIT/OPERATION (%): -6.4
AVERAGE OPERATION DURATION (days): 32.0
MAXIMUM OPERATION DURATION (days): 51
MINIMUM OPERATION DURATION (days): 3
ACTIVE OPERATION TIME (%): 22.1

Volatility 8,38%

Average	(X-average)^2	Variance	ndard deviation
10,72%	0,005804263	0,007023	0,083801
	0,003342492		
	0,000353977		
	0,00153552		
	0,001029493		
	0,009232464		
	0,027860379		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
07-Aug-2015	18-Sep-20:	-7,50%		-7,50%	29	-7,50%
28-Oct-2015	04-Jun-201	0,00%		0,00%	151	-7,50%
22-Aug-2018	30-Nov-20	-38,00%	4,38%	-33,62%	70	-41,12%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): -45.5
PROFIT/YEAR (%): -12.7
COMPOUND PROFIT (%): -42.7
PASSIVE PROFIT (%): -60.3
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.8
% OF POSITIVE OPERATIONS: 33.3
% OF NEGATIVE OPERATIONS: 66.7
MAXIMUM PROFIT (%): -7.5
MINIMUM PROFIT (%): -45.5

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -38.0
AVERAGE PROFIT/OPERATION (%): -15.2
MAXIMUM PROFIT/OPERATION (%): +0.0
MINIMUM PROFIT/OPERATION (%): -38.0
AVERAGE OPERATION DURATION (days): 83.3
MAXIMUM OPERATION DURATION (days): 151
MINIMUM OPERATION DURATION (days): 29
ACTIVE OPERATION TIME (%): 27.7

Volatility 15,85%

Average	(X-average)^2	Variance	ndard deviation
-18,71%	0,012558938	0,025118	0,158486
	0,012558938		
	0,050235751		

General Electric

	Buy dates	Sale dayes	Performance	Div.	Prfm.Div.	Days of position	Cumulative performance
RSI14	07/06/2015	28/05/2015	10,10%		10,10%	36	10,10%
BUY30	16/06/2015	09/10/2015	-0,20%		-0,20%	81	9,90%
SELL70	15/01/2016	03/03/2016	4,10%		4,10%	32	14,00%
	04/05/2016	25/06/2016	-1,20%		-1,20%	37	12,80%
	02/08/2016	17/11/2016	1,70%	2,91%	4,61%	76	17,41%
	12/01/2017	22/02/2017	-3,10%	3,26%	0,16%	27	17,57%
	23/03/2017	17/06/2017	-6,10%	3,47%	-2,63%	60	14,94%
	01/07/2017	28/09/2017	-11,10%	3,88%	-7,22%	61	7,72%
	14/10/2017	11/01/2018	-21,50%	2,71%	-18,79%	60	-11,07%
	24/01/2018	28/04/2018	-12,30%	6,67%	-5,63%	66	-16,70%
	08/06/2018	04/01/2019	-40,10%	4,38%	-35,72%	144	-52,42%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +4.7	0,02204545	0,00623382	0,04136642	0,203387362
TOTAL PROFIT (%): -79.8	MINIMUM PROFIT STREAK (%): -94.3		0,005922002		
PROFIT/YEAR (%): -19.6	AVERAGE PROFIT/OPERATION (%): -7.3		0,013913275		
COMPOUND PROFIT (%): -61.7	MAXIMUM PROFIT/OPERATION (%): +10.1		0,011226366		
PASSIVE PROFIT (%): -62.0	MINIMUM PROFIT/OPERATION (%): -40.1		0,023120585		
NUMBER OF OPERATIONS: 11	AVERAGE OPERATION DURATION (days): 61.8		0,023609719		
NUMBER OF OPERATIONS/YEAR: 2.7	MAXIMUM OPERATION DURATION (days): 144		0,01621918		
% OF POSITIVE OPERATIONS: 27.3	MINIMUM OPERATION DURATION (days): 27		0,003042024		
% OF NEGATIVE OPERATIONS: 72.7	ACTIVE OPERATION TIME (%): 66.3		0,017621356		
MAXIMUM PROFIT (%): +14.5	**MINIMUM PROFIT (%): -79.8**		0,035738184		
Volatility 20,34%			0,298384097		

	Buy dates	Sale dayes	Performance	Div.	Prfm.Div.	Days of position	Cumulative performance
RSI14	07/04/2015	28/05/2015	10,10%		10,10%	36	10,10%
BUY35	11/06/2015	17/10/2015	3,10%		3,10%	90	13,20%
SELL80	15/12/2015	04/03/2016	-0,80%		-0,80%	54	12,40%
	04/05/2016	16/07/2016	9,80%		9,80%	51	22,20%
	29/07/2016	22/11/2016	1,50%	2,91%	4,41%	81	26,61%
	11/01/2017	23/02/2017	-4%	3,26%	-0,74%	29	25,87%
	22/03/2017	12/01/2018	-43,20%	10,06%	-33,14%	205	-7,27%
	23/01/2018	19/05/2018	-2,50%	6,67%	4,17%	82	-3,10%
	07/06/2018	16/01/2019	-34,40%	4,37%	-30,03%	153	-33,13%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +13.5	-0,0368111	0,018991902	0,02592949	0,161026365
TOTAL PROFIT (%): -60.5	MINIMUM PROFIT STREAK (%): -84.1		0,000961		
PROFIT/YEAR (%): -14.9	AVERAGE PROFIT/OPERATION (%): -6.7		0,000064		
COMPOUND PROFIT (%): -56.3	MAXIMUM PROFIT/OPERATION (%): +10.1		0,009604		
PASSIVE PROFIT (%): -62.0	MINIMUM PROFIT/OPERATION (%): -43.2		0,00194481		
NUMBER OF OPERATIONS: 9	AVERAGE OPERATION DURATION (days): 86.8		5,476E-05		
NUMBER OF OPERATIONS/YEAR: 2.2	MAXIMUM OPERATION DURATION (days): 205		0,10982596		
% OF POSITIVE OPERATIONS: 44.4	MINIMUM OPERATION DURATION (days): 29		0,00173889		
% OF NEGATIVE OPERATIONS: 55.6	ACTIVE OPERATION TIME (%): 76.2		0,09018009		
MAXIMUM PROFIT (%): +23.6	**MINIMUM PROFIT (%): -60.5**				
Volatility 16,10%					

	Buy dates	Sale dayes	Performance	Div.	Prfm.Div.	Days of position	Cumulative performance
RSI14	01/05/2015	30/05/2015	3%		3%	20	3,00%
BUY20	26/08/2015	08/10/2015	13,30%		13%	30	16,30%
SELL65	05/05/2016	04/06/2016	0,80%		1%	21	17,10%
	04/08/2016	01/11/2016	-4,50%	2,91%	-2%	62	15,51%
	25/01/2017	23/02/2017	2,90%	3,26%	6%	20	21,67%
	02/05/2017	16/06/2017	-4,90%		-5%	32	16,77%
	01/07/2017	28/09/2017	-11,10%	3,88%	-7%	61	9,55%
	04/11/2017	11/01/2018	-10%		-10%	45	-0,45%
	01/02/2018	24/04/2018	-7,60%		-8%	56	-8,05%
	21/08/2018	11/10/2018	7,70%		8%	36	-0,35%
	07/11/2018	04/01/2019	-15%		-15%	38	-15,35%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +14.0	0,06881818	0,001506851	0,012995	0,113997
TOTAL PROFIT (%): -25.4	MINIMUM PROFIT STREAK (%): -42.4		0,008870215		
PROFIT/YEAR (%): -6.2	AVERAGE PROFIT/OPERATION (%): -2.3		0,010441124		
COMPOUND PROFIT (%): -25.6	MAXIMUM PROFIT/OPERATION (%): +13.3		0,007444552		
PASSIVE PROFIT (%): -64.2	MINIMUM PROFIT/OPERATION (%): -15.0		0,021869032		
NUMBER OF OPERATIONS: 11	AVERAGE OPERATION DURATION (days): 38.3		0,009777614		
NUMBER OF OPERATIONS/YEAR: 2.7	MAXIMUM OPERATION DURATION (days): 62		0,000711919		
% OF POSITIVE OPERATIONS: 45.5	MINIMUM OPERATION DURATION (days): 20		0,005375556		
% OF NEGATIVE OPERATIONS: 54.5	ACTIVE OPERATION TIME (%): 41.1		0,022295919		
MAXIMUM PROFIT (%): +17.0	**MINIMUM PROFIT (%): -25.4**		0,005229919		
Volatility 11,40%			0,049425374		

	Buy dates	Sale dayes	Performance	Div.	Prfm.Div.	Days of position	Cumulative performance
RSI14	25/01/2017	23/02/2017	2,90%	3,26%	6,16%	20	6,16%
BUY10	21/08/2018	21/09/2018	-0,90%		-0,90%	22	5,26%
SELL50	13/11/2018	28/12/2018	-17,20%		-17,20%	30	-11,94%

Average	(X-average)^2	Variance	Standard deviation
-0,0017333	0,004011111	0,00693622	0,083283985
	0,002952111		
	0,013845444		

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -15.2
PROFIT/YEAR (%): -3.7
COMPOUND PROFIT (%): -15.5
PASSIVE PROFIT (%): -69.1
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 33.3
% OF NEGATIVE OPERATIONS: 66.7
MAXIMUM PROFIT (%): +2.9
Volatility 8,33%

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -18.1
AVERAGE PROFIT/OPERATION (%): -5.1
MAXIMUM PROFIT/OPERATION (%): +2.9
MINIMUM PROFIT/OPERATION (%): -17.2
AVERAGE OPERATION DURATION (days): 24.0
MAXIMUM OPERATION DURATION (days): 30
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 7.0
MINIMUM PROFIT (%): -15.2

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
28-Mar-2015	14-Apr-2015	14,90%		14,90%	10	14,90%
01-May-2015	27-May-2015	3,70%		3,70%	17	18,60%
11-Jun-2015	21-Jul-2015	2,50%		2,50%	27	21,10%
06-Aug-2015	15-Sep-2015	-8,70%		-8,70%	27	12,40%
10-Dec-2015	31-Dec-2015	4,00%		4,00%	14	16,40%
09-Jan-2016	01-Mar-2016	0,20%		0,20%	34	16,60%
13-Apr-2016	04-Jun-2016	-1,10%	3,47%	2,37%	37	18,97%
03-Aug-2016	01-Nov-2016	-4,10%		-4,10%	63	14,87%
08-Nov-2016	19-Nov-2016	9,90%		9,90%	9	24,77%
11-Jan-2017	22-Feb-2017	-4,20%		-4,20%	28	20,57%
15-Mar-2017	11-Apr-2017	0,20%		0,20%	19	20,77%
26-Apr-2017	16-Jun-2017	-6,20%		-6,20%	36	14,57%
01-Jul-2017	28-Sep-2017	-11,10%		-11,10%	61	3,47%
13-Oct-2017	11-Jan-2018	-21,20%	2,71%	-18,49%	61	-15,02%
24-Jan-2018	21-Apr-2018	-9,60%		-9,60%	61	-24,62%
06-Jun-2018	12-Jul-2018	2,00%		2,00%	25	-22,62%
27-Jul-2018	04-Jan-2019	-38,40%		-38,40%	110	-61,02%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -67.3
PROFIT/YEAR (%): -16.5
COMPOUND PROFIT (%): -56.7
PASSIVE PROFIT (%): -62.2
NUMBER OF OPERATIONS: 17
NUMBER OF OPERATIONS/YEAR: 4.2
% OF POSITIVE OPERATIONS: 47.1
% OF NEGATIVE OPERATIONS: 52.9
MAXIMUM PROFIT (%): +21.3
MINIMUM PROFIT (%): -67.3

MAXIMUM PROFIT STREAK (%): +9.9
MINIMUM PROFIT STREAK (%): -88.6
AVERAGE PROFIT/OPERATION (%): -4.0
MAXIMUM PROFIT/OPERATION (%): +14.9
MINIMUM PROFIT/OPERATION (%): -38.4
AVERAGE OPERATION DURATION (days): 37.6
MAXIMUM OPERATION DURATION (days): 110
MINIMUM OPERATION DURATION (days): 9
ACTIVE OPERATION TIME (%): 62.3

Volatility 23,08%

BUY25
SELL80

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
23-Jan-2015	26-Feb-2015	3,60%		3,60%	23	3,60%
25-Mar-2015	04-Mar-2016	17,50%		17,50%	238	21,10%
12-Mar-2016	16-Jul-2016	8,40%		8,40%	87	29,50%
27-Jul-2016	23-Nov-2016	-0,10%		-0,10%	84	29,40%
07-Dec-2016	24-May-2018	-56,40%	6,18%	-50,22%	367	-20,82%
31-May-2018	30-Jan-2019	-36,80%	4,38%	-32,42%	168	-53,24%

BUY55
SELL85

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -63.8
PROFIT/YEAR (%): -15.8
COMPOUND PROFIT (%): -63.7
PASSIVE PROFIT (%): -64.7
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.5
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +29.5
MINIMUM PROFIT (%): -63.8

MAXIMUM PROFIT STREAK (%): +25.9
MINIMUM PROFIT STREAK (%): -93.3
AVERAGE PROFIT/OPERATION (%): -10.6
MAXIMUM PROFIT/OPERATION (%): +17.5
MINIMUM PROFIT/OPERATION (%): -56.4
AVERAGE OPERATION DURATION (days): 161.2
MAXIMUM OPERATION DURATION (days): 367
MINIMUM OPERATION DURATION (days): 23
ACTIVE OPERATION TIME (%): 95.5

Volatility 33,00%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
28-Mar-2015	16-Jul-2016	27,90%		27,90%	328	27,90%
29-Jul-2016	23-Nov-2016	2,30%		2,30%	82	30,20%
10-Jan-2017	24-May-2018	-57,60%		-57,60%	345	-27,40%
05-Jun-2018	30-Jan-2019	-36,60%		-36,60%	165	-64,00%

BUY45
SELL90

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -63.9
PROFIT/YEAR (%): -15.9
COMPOUND PROFIT (%): -64.8
PASSIVE PROFIT (%): -67.0
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.0
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +30.2
MINIMUM PROFIT (%): -63.9

MAXIMUM PROFIT STREAK (%): +2.3
MINIMUM PROFIT STREAK (%): -94.1
AVERAGE PROFIT/OPERATION (%): -16.0
MAXIMUM PROFIT/OPERATION (%): +27.9
MINIMUM PROFIT/OPERATION (%): -57.6
AVERAGE OPERATION DURATION (days): 230.0
MAXIMUM OPERATION DURATION (days): 345
MINIMUM OPERATION DURATION (days): 82
ACTIVE OPERATION TIME (%): 90.8

Volatility 45,68%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
25-Jan-2017	23-Feb-2017	2,90%		2,90%	20	2,90%
21-Aug-2018	10-Oct-2018	10,60%		10,60%	35	13,50%
13-Nov-2018	03-Jan-2019	-13,10%		-13,10%	33	0,40%

BUY10
SELL60

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +0.4
PROFIT/YEAR (%): +0.1
COMPOUND PROFIT (%): -1.1
PASSIVE PROFIT (%): -73.0
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 66.7
% OF NEGATIVE OPERATIONS: 33.3
MAXIMUM PROFIT (%): +13.5
MINIMUM PROFIT (%): +0.4

MAXIMUM PROFIT STREAK (%): +10.6
MINIMUM PROFIT STREAK (%): -13.1
AVERAGE PROFIT/OPERATION (%): +0.1
MAXIMUM PROFIT/OPERATION (%): +10.6
MINIMUM PROFIT/OPERATION (%): -13.1
AVERAGE OPERATION DURATION (days): 29.3
MAXIMUM OPERATION DURATION (days): 35
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 8.7

Volatility 6,95%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
03-Feb-2015	02-Apr-201	7,50%		7,50%	41	7,50%
17-Apr-2015	12-May-20	-4,70%		-4,70%	17	2,80%
23-Jul-2015	24-Jul-2015	-2,70%		-2,70%	1	0,10%
24-Sep-2015	08-Dec-20:	24,60%		24,60%	51	24,70%
01-Mar-2016	14-Apr-20:	0,60%		0,60%	32	25,30%
19-Apr-2016	20-Apr-201	-0,70%		-0,70%	1	24,60%
10-Jun-2016	09-Aug-20:	4,90%		4,90%	41	29,50%
26-Oct-2016	10-Jan-201	11,40%		11,40%	51	40,90%
04-Mar-2017	23-Mar-20	-5,60%		-5,60%	13	35,30%
14-Apr-2017	03-May-20	-6,20%	3,47%	-2,73%	12	32,57%
20-Jun-2017	12-Jul-201	-13,70%		-13,70%	15	18,87%
01-Sep-2017	14-Sep-201	-2,80%		-2,80%	8	16,07%
15-Sep-2017	27-Oct-201	-9,30%		-9,30%	30	6,77%
20-Dec-2017	02-Feb-20:	-15,50%	2,71%	-12,79%	29	-6,02%
10-Mar-2018	14-Jun-20:	-1,10%		-1,10%	66	-7,12%
20-Jul-2018	31-Jul-2018	-6,40%		-6,40%	7	-13,52%
19-Sep-2018	27-Sep-201	-12,70%		-12,70%	6	-26,22%
09-Oct-2018	02-Nov-20:	-26,40%		-26,40%	18	-52,62%
27-Dec-2018	27-Feb-20:	57,20%		57,20%	42	4,58%

		Average	(X-average)^2	Variance	ndard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +57.2	8,63%	0,000128763	0,051368	0,226646
TOTAL PROFIT (%): -1.4	MINIMUM PROFIT STREAK (%): -99.6		0,003404415		
PROFIT/YEAR (%): -0.4	AVERAGE PROFIT/OPERATION (%): -0.1		0,007284173		
COMPOUND PROFIT (%): -22.7	MAXIMUM PROFIT/OPERATION (%): +57.2		0,025809268		
PASSIVE PROFIT (%): -55.0	MINIMUM PROFIT/OPERATION (%): -26.4		0,0277731		
NUMBER OF OPERATIONS: 19	AVERAGE OPERATION DURATION (days): 25.3		0,025488963		
NUMBER OF OPERATIONS/YEAR: 4.7	MAXIMUM OPERATION DURATION (days): 66		0,043535921		
% OF POSITIVE OPERATIONS: 31.6	MINIMUM OPERATION DURATION (days): 1		0,104104721		
% OF NEGATIVE OPERATIONS: 68.4	ACTIVE OPERATION TIME (%): 46.9		0,071103626		
MAXIMUM PROFIT (%): +41.0			0,057289682		
MINIMUM PROFIT (%): -58.6	**Volatility** 22,66%		0,010476061		
			0,005528314		
			0,000347724		
			0,021476131		
			0,024821173		
			0,049083236		
			0,121485268		
			0,375214279		
			0,001644089		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
04-Mar-2015	30-Apr-20:	3,10%		3,10%	40	3,10%
16-Oct-2015	24-Dec-20:	13,40%		13,40%	48	16,50%
05-Apr-2016	08-Apr-201	-3,90%		-3,90%	3	12,60%
16-Jul-2016	10-Aug-201	-5,80%		-5,80%	17	6,80%
24-Nov-2016	20-Jan-20:	-2,00%	2,71%	0,71%	37	7,51%
21-Apr-2018	04-Jul-201:	-6,40%		-6,40%	51	1,11%
17-Jan-2019	27-Feb-201	26,30%		26,30%	28	27,41%

		Average	(X-average)^2	Variance	ndard deviation
NUMBER OF YEARS: 4.0	MAXIMUM PROFIT STREAK (%): +26.3	10,72%	0,005804263	0,007023	0,083801
TOTAL PROFIT (%): +24.7	MINIMUM PROFIT STREAK (%): -18.1		0,003342492		
PROFIT/YEAR (%): +6.1	AVERAGE PROFIT/OPERATION (%): +3.5		0,000353977		
COMPOUND PROFIT (%): +22.6	MAXIMUM PROFIT/OPERATION (%): +26.3		0,00153552		
PASSIVE PROFIT (%): -59.2	MINIMUM PROFIT/OPERATION (%): -6.4		0,001029493		
NUMBER OF OPERATIONS: 7	AVERAGE OPERATION DURATION (days): 32.0		0,009232464		
NUMBER OF OPERATIONS/YEAR: 1.7	MAXIMUM OPERATION DURATION (days): 51		0,027860379		
% OF POSITIVE OPERATIONS: 42.9	MINIMUM OPERATION DURATION (days): 3				
% OF NEGATIVE OPERATIONS: 57.1	ACTIVE OPERATION TIME (%): 22.1				
MAXIMUM PROFIT (%): +24.7					
MINIMUM PROFIT (%): -1.6	**Volatility** 8,38%				

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
07-Aug-2015	18-Sep-20:	-7,50%		-7,50%	29	-7,50%
28-Oct-2015	04-Jun-201	0,00%		0,00%	151	-7,50%
22-Aug-2018	30-Nov-20	-38,00%	4,38%	-33,62%	70	-41,12%

		Average	(X-average)^2	Variance	ndard deviation
NUMBER OF YEARS: 3.6	MAXIMUM PROFIT STREAK (%): +0.0	-18,71%	0,012558938	0,025118	0,158486
TOTAL PROFIT (%): -45.5	MINIMUM PROFIT STREAK (%): -38.0		0,012558938		
PROFIT/YEAR (%): -12.7	AVERAGE PROFIT/OPERATION (%): -15.2		0,050235751		
COMPOUND PROFIT (%): -42.7	MAXIMUM PROFIT/OPERATION (%): +0.0				
PASSIVE PROFIT (%): -60.3	MINIMUM PROFIT/OPERATION (%): -38.0				
NUMBER OF OPERATIONS: 3	AVERAGE OPERATION DURATION (days): 83.3				
NUMBER OF OPERATIONS/YEAR: 0.8	MAXIMUM OPERATION DURATION (days): 151				
% OF POSITIVE OPERATIONS: 33.3	MINIMUM OPERATION DURATION (days): 29				
% OF NEGATIVE OPERATIONS: 66.7	ACTIVE OPERATION TIME (%): 27.7				
MAXIMUM PROFIT (%): -7.5					
MINIMUM PROFIT (%): -45.5	**Volatility** 15,85%				

Facebook

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	02/05/2015	03/06/2015	0,20%		0,20%	21	0,20%
BUY30	25/08/2015	23/09/2015	25,80%		25,80%	20	26,00%
SELL70	09/01/2016	01/03/2016	7,10%		7,10%	34	33,10%
	15/01/2016	14/07/2016	3,90%		3,90%	20	37,00%
	12/11/2016	22/12/2016	2,90%		2,90%	27	39,90%
	19/05/2017	21/07/2017	7,80%		7,80%	43	47,70%
	22/11/2017	12/01/2018	1,50%		1,50%	34	49,20%
	24/03/2018	25/04/2018	-0,30%		-0,30%	21	48,90%
	28/07/2018	15/12/2018	-19,40%		-19,40%	97	29,50%
	25/12/2018	25/01/2019	17,40%		17,40%	20	46,90%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +49.0	0,0469	0,00201601	0,01262049	0,112340954
TOTAL PROFIT (%): +47.0	MINIMUM PROFIT STREAK (%): -19.7		0,04456321		
PROFIT/YEAR (%): +11.5	AVERAGE PROFIT/OPERATION (%): +4.7		0,00058081		
COMPOUND PROFIT (%): +49.2	MAXIMUM PROFIT/OPERATION (%): +25.8		6,241E-05		
PASSIVE PROFIT (%): +104.4	MINIMUM PROFIT/OPERATION (%): -19.4		0,00032041		
NUMBER OF OPERATIONS: 10	AVERAGE OPERATION DURATION (days): 33.7		0,00096721		
NUMBER OF OPERATIONS/YEAR: 2.5	MAXIMUM OPERATION DURATION (days): 97		0,00101761		
% OF POSITIVE OPERATIONS: 80.0	MINIMUM OPERATION DURATION (days): 20		0,00249001		
% OF NEGATIVE OPERATIONS: 20.0	ACTIVE OPERATION TIME (%): 32.9		0,05803281		
MAXIMUM PROFIT (%): +49.2	**MINIMUM PROFIT (%): +0.2**		0,01615441		

Volatility 11,23%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	02/05/2015	21/07/2015	24,20%		24,20%	54	24,20%
BUY35	19/08/2015	23/09/2015	-2,10%		-2,10%	24	22,10%
SELL80	15/12/2015	02/03/2016	5,60%		5,60%	52	27,70%
	19/04/2016	16/07/2016	8,30%		8,30%	62	36,00%
	18/08/2016	25/10/2016	10,50%		10,50%	47	46,50%
	05/11/2016	24/01/2017	8,80%		8,80%	52	55,30%
	19/05/2017	27/07/2017	7,70%		7,70%	47	63,00%
	30/08/2017	15/05/2018	13%		13,00%	177	76,00%
	28/07/2018	15/02/2019	-7%		-7,00%	139	69,00%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +53.8	0,07666667	0,027335111	0,00695867	0,083418623
TOTAL PROFIT (%): +68.8	MINIMUM PROFIT STREAK (%): -7.0		0,009538778		
PROFIT/YEAR (%): +16.9	AVERAGE PROFIT/OPERATION (%): +7.6		0,000427111		
COMPOUND PROFIT (%): +88.9	MAXIMUM PROFIT/OPERATION (%): +24.2		4,01111E-05		
PASSIVE PROFIT (%): +104.4	MINIMUM PROFIT/OPERATION (%): -7.0		0,000802778		
NUMBER OF OPERATIONS: 9	AVERAGE OPERATION DURATION (days): 72.7		0,000128444		
NUMBER OF OPERATIONS/YEAR: 2.2	MAXIMUM OPERATION DURATION (days): 177		1,11111E-07		
% OF POSITIVE OPERATIONS: 77.8	MINIMUM OPERATION DURATION (days): 24		0,002844444		
% OF NEGATIVE OPERATIONS: 22.2	ACTIVE OPERATION TIME (%): 63.8		0,021511111		
MAXIMUM PROFIT (%): +75.9	**MINIMUM PROFIT (%): +22.1**				
Volatility 8,34%					

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	02/05/2015	21/07/2015	24,20%		24,20%	54	24,20%
BUY25	25/08/2015	23/09/2015	25,80%		25,80%	20	50,00%
SELL80	09/01/2016	02/03/2016	7,50%		7,50%	35	57,50%
	16/11/2016	24/01/2017	7,70%		7,70%	45	65,20%
	19/05/2017	27/07/2017	7,70%		7,70%	47	72,90%
	28/03/2018	15/05/2018	23,90%		23,90%	33	96,80%
	02/08/2018	15/02/2019	-3,60%		-3,60%	136	93,20%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +72.6	0,13314286	0,011849878	0,01099127	0,104839236
TOTAL PROFIT (%): +93.1	MINIMUM PROFIT STREAK (%): -3.6		0,015589306		
PROFIT/YEAR (%): +22.9	AVERAGE PROFIT/OPERATION (%): +13.3		0,003380592		
COMPOUND PROFIT (%): +132.5	MAXIMUM PROFIT/OPERATION (%): +25.8		0,00315202		
PASSIVE PROFIT (%): +104.4	MINIMUM PROFIT/OPERATION (%): -3.6		0,00315202		
NUMBER OF OPERATIONS: 7	AVERAGE OPERATION DURATION (days): 52.9		0,011205735		
NUMBER OF OPERATIONS/YEAR: 1.7	MAXIMUM OPERATION DURATION (days): 136		0,028609306		
% OF POSITIVE OPERATIONS: 85.7	MINIMUM OPERATION DURATION (days): 20				
% OF NEGATIVE OPERATIONS: 14.3	ACTIVE OPERATION TIME (%): 36.1				
MAXIMUM PROFIT (%): +96.8	**MINIMUM PROFIT (%): +24.2**				
Volatility 10,48%					

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	12/05/2015	25/06/2016	10,10%		10,10%	31	10,10%
BUY20	26/08/2015	24/09/2015	9,90%		9,90%	20	20,00%
SELL65	28/03/2018	28/04/2018	14,90%		14,90%	22	34,90%
	21/11/2018	15/01/2019	9,80%		9,80%	35	44,70%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +34.6	0,149	0,002304	0,00185125	0,043026155
TOTAL PROFIT (%): +44.7	MINIMUM PROFIT STREAK (%): +0.0		0,0025		
PROFIT/YEAR (%): +11.0	AVERAGE PROFIT/OPERATION (%): +11.2		0		
COMPOUND PROFIT (%): +52.6	MAXIMUM PROFIT/OPERATION (%): +14.9		0,002601		
PASSIVE PROFIT (%): +105.1	MINIMUM PROFIT/OPERATION (%): +9.8				
NUMBER OF OPERATIONS: 4	AVERAGE OPERATION DURATION (days): 27.0				
NUMBER OF OPERATIONS/YEAR: 1.0	MAXIMUM OPERATION DURATION (days): 35				
% OF POSITIVE OPERATIONS: 100.0	MINIMUM OPERATION DURATION (days): 20				
% OF NEGATIVE OPERATIONS: 0.0	ACTIVE OPERATION TIME (%): 10.5				
MAXIMUM PROFIT (%): +44.7	**MINIMUM PROFIT (%): +10.1**				
Volatility 4,30%					

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	04/02/2015	22/07/2015	36,80%		36,80%	116	36,80%
BUY55	07/08/2015	23/09/2015	-6,20%		-6,20%	32	30,60%
SELL85	30/09/2015	29/10/2015	19,10%		19,10%	21	49,70%
	18/11/2015	09/09/2016	17,20%		17,20%	203	66,90%
	27/09/2016	24/02/2017	12,40%		12,40%	103	79,30%
	22/03/2017	04/05/2017	7,10%		7,10%	30	86,40%
	18/05/2017	15/05/2018	17,60%		17,60%	249	104,00%
	06/07/2018	15/02/2019	-13,80%		-13,80%	155	90,20%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +90.1
PROFIT/YEAR (%): +22.1
COMPOUND PROFIT (%): +118.4
PASSIVE PROFIT (%): +120.2
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 75.0
% OF NEGATIVE OPERATIONS: 25.0
MAXIMUM PROFIT (%): +104.0
Volatility 26,63%

MAXIMUM PROFIT STREAK (%): +73.3
MINIMUM PROFIT STREAK (%): -13.8
AVERAGE PROFIT/OPERATION (%): +11.3
MAXIMUM PROFIT/OPERATION (%): +36.8
MINIMUM PROFIT/OPERATION (%): -13.8
AVERAGE OPERATION DURATION (days): 113.6
MAXIMUM OPERATION DURATION (days): 249
MINIMUM OPERATION DURATION (days): 21
ACTIVE OPERATION TIME (%): 88.7
MINIMUM PROFIT (%): +30.6

FB

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
10-Feb-2015	11-Mar-2015	11,10%		11,10%	20	11,10%
10-Apr-2015	21-May-2015	-7,30%		-7,30%	29	3,80%
10-Jun-2015	09-Jul-2015 2	8,30%		8,30%	20	12,10%
08-Aug-2015	11-Sep-2015	-9,60%		-9,60%	23	2,50%
30-Sep-2015	28-Oct-2015	16,80%		16,80%	20	19,30%
26-Nov-2015	31-Dec-2015	-3,20%		-3,20%	23	16,10%
06-Jan-2016	04-Feb-2016	7,60%		7,60%	20	23,70%
12-Feb-2016	15-Mar-2016	10,90%		10,90%	21	34,60%
19-Mar-2016	23-Apr-2016	-1,10%		-1,10%	24	33,50%
26-Apr-2016	24-May-2016	6,40%		6,40%	20	39,90%
09-Jun-2016	08-Jul-2016 2	1,10%		1,10%	20	41,00%
17-Aug-2016	15-Sep-2016	2,00%		2,00%	20	43,00%
27-Sep-2016	25-Oct-2016	6,80%		6,80%	20	49,80%
04-Nov-2016	06-Dec-2016	-2,90%		-2,90%	21	46,90%
07-Dec-2016	10-Jan-2017	5,30%		5,30%	22	52,20%
22-Mar-2017	22-Apr-2017	1,90%		1,90%	22	54,10%
18-May-2017	21-Jun-2017	2,50%		2,50%	23	56,60%
29-Jun-2017	28-Jul-2017 2	11,70%		11,70%	20	68,30%
12-Aug-2017	12-Sep-2017	0,00%		0,00%	20	68,30%
23-Sep-2017	21-Oct-2017	3,00%		3,00%	20	71,30%
26-Oct-2017	23-Nov-2017	4,50%		4,50%	20	75,80%
25-Nov-2017	23-Dec-2017	-2,80%		-2,80%	20	73,00%
28-Dec-2017	03-Feb-2018	2,50%		2,50%	25	75,50%
09-Feb-2018	10-Mar-2018	0,20%		0,20%	20	75,70%
17-Mar-2018	17-Apr-2018	-11,70%		-11,70%	20	64,00%
06-Jul-2018	16-Aug-2018 :	-6,10%		-6,10%	29	57,90%
23-Aug-2018	27-Sep-2018	-6,90%		-6,90%	24	51,00%
02-Oct-2018	02-Nov-2018	-6,60%		-6,60%	23	44,40%
06-Nov-2018	12-Dec-2018	-4,40%		-4,40%	24	40,00%
21-Dec-2018	23-Jan-2019	14,10%		14,10%	20	54,10%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +54.0
PROFIT/YEAR (%): +13.2
COMPOUND PROFIT (%): +58.7
PASSIVE PROFIT (%): +117.9
NUMBER OF OPERATIONS: 30
NUMBER OF OPERATIONS/YEAR: 7.3
% OF POSITIVE OPERATIONS: 63.3
% OF NEGATIVE OPERATIONS: 36.7
MAXIMUM PROFIT (%): +75.7
MINIMUM PROFIT (%): +2.5

MAXIMUM PROFIT STREAK (%): +73.2
MINIMUM PROFIT STREAK (%): -35.9
AVERAGE PROFIT/OPERATION (%): +1.8
MAXIMUM PROFIT/OPERATION (%): +16.8
MINIMUM PROFIT/OPERATION (%): -11.7
AVERAGE OPERATION DURATION (days): 21.8
MAXIMUM OPERATION DURATION (days): 29
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 63.6
Volatility 22,22%

50.50

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	12/02/2015	23/09/2015	26%		26%	154	26%
BUY45	01/10/2015	15/02/2019	82,40%		82%	850	108%
SELL90							

BUY45
SELL90

Volatility 58,27%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +108.4
PROFIT/YEAR (%): +26.6
COMPOUND PROFIT (%): +129.8
PASSIVE PROFIT (%): +117.7
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +108.4

MAXIMUM PROFIT STREAK (%): +82.4
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +54.2
MAXIMUM PROFIT/OPERATION (%): +82.4
MINIMUM PROFIT/OPERATION (%): +26.0
AVERAGE OPERATION DURATION (days): 502.0
MAXIMUM OPERATION DURATION (days): 850
MINIMUM OPERATION DURATION (days): 154
ACTIVE OPERATION TIME (%): 98.0
MINIMUM PROFIT (%): +26.0

There is not any operations for strategies 10-60 and 10-50.

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
22/04/2015	11/06/2015	-9,60%		-9,60%	35	-9,60%
19/08/2015	26/09/2015	-0,50%		-0,50%	27	-10,10%
09/12/2015	19/02/2016	-1,30%		-1,30%	48	-11,40%
14/04/2016	11/05/2016	4,70%		4,70%	19	-6,70%
14/06/2016	20/07/2016	5,10%		5,10%	25	-1,60%
25/08/2016	22/09/2016	3,40%		3,40%	19	1,80%
05/10/2016	26/10/2016	5,40%		5,40%	15	7,20%
05/11/2016	17/12/2016	6,70%		6,70%	29	13,90%
23/03/2017	12/05/2017	7,20%		7,20%	35	21,10%
19/05/2017	20/07/2017	8%		8,00%	42	29,10%
26/08/2017	19/10/2017	4,30%		4,30%	37	33,40%
02/12/2017	11/01/2018	4,70%		4,70%	26	38,10%
18/01/2018	03/02/2018	3,30%		3,30%	12	41,40%
06/02/2018	16/03/2018	-2,50%		-2,50%	27	38,90%
24/03/2018	28/04/2018	7,80%		7,80%	24	46,70%
06/07/2018	18/10/2018	-17,70%		-17,70%	73	29,00%
30/10/2018	09/11/2018	0,40%		0,40%	8	29,40%
17/11/2018	15/12/2018	0,30%		0,30%	18	29,70%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +29.7
PROFIT/YEAR (%): +7.3
COMPOUND PROFIT (%): +29.2
PASSIVE PROFIT (%): +83.2
NUMBER OF OPERATIONS: 18
NUMBER OF OPERATIONS/YEAR: 4.4
% OF POSITIVE OPERATIONS: 72.2
% OF NEGATIVE OPERATIONS: 27.8
MAXIMUM PROFIT (%): +46.7
MINIMUM PROFIT (%): -11.4

MAXIMUM PROFIT STREAK (%): +58.1
MINIMUM PROFIT STREAK (%): -17.7
AVERAGE PROFIT/OPERATION (%): +1.6
MAXIMUM PROFIT/OPERATION (%): +8.0
MINIMUM PROFIT/OPERATION (%): -17.7
AVERAGE OPERATION DURATION (days): 28.8
MAXIMUM OPERATION DURATION (days): 73
MINIMUM OPERATION DURATION (days): 8
ACTIVE OPERATION TIME (%): 50.6

Volatility 19,40%

Average	(X-average)^2	Variance	Standard deviation
0,177944	0,0750	0,0376	0,1940
	0,0778		
	0,0852		
	0,0600		
	0,0376		
	0,0256		
	0,0112		
	0,0015		
	0,0011		
	0,0128		
	0,0244		
	0,0412		
	0,0557		
	0,0445		
	0,0836		
	0,0126		
	0,0135		
	0,0142		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	06/03/2015	4,20%		4,20%	9	4,20%
30/04/2015	16/07/2015	13,20%		13,20%	53	17,40%
27/08/2015	31/10/2015	24,40%		24,40%	46	41,80%
19/12/2015	16/08/2016	13,20%		13,20%	164	55,00%
23/08/2016	31/01/2017	11,80%		11,80%	110	66,80%
25/03/2017	16/05/2018	19,40%		19,40%	287	86,20%
31/07/2018	17/01/2019	-13,70%		-13,70%	117	72,50%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +72.5
PROFIT/YEAR (%): +18.0
COMPOUND PROFIT (%): +91.4
PASSIVE PROFIT (%): +104.8
NUMBER OF OPERATIONS: 7
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 85.7
% OF NEGATIVE OPERATIONS: 14.3
MAXIMUM PROFIT (%): +86.2
MINIMUM PROFIT (%): +4.2

MAXIMUM PROFIT STREAK (%): +82.0
MINIMUM PROFIT STREAK (%): -13.7
AVERAGE PROFIT/OPERATION (%): +10.4
MAXIMUM PROFIT/OPERATION (%): +24.4
MINIMUM PROFIT/OPERATION (%): -13.7
AVERAGE OPERATION DURATION (days): 112.3
MAXIMUM OPERATION DURATION (days): 287
MINIMUM OPERATION DURATION (days): 9
ACTIVE OPERATION TIME (%): 77.7

Volatility 7,64%

Average	(X-average)^2	Variance	Standard deviation
0,49128571	0,201857653	0,07637506	0,076375061
	0,100670224		
	0,005370796		
	0,003447367		
	0,031227939		
	0,137429082		
	0,054622367		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30/07/2015	01/08/2015	-2%		-2%	2	-2%
09/06/2016	27/06/2017	34,30%		34%	264	32%
09/09/2017	27/02/2019	-0,90%		-1%	368	31%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): +31.4
PROFIT/YEAR (%): +8.8
COMPOUND PROFIT (%): +30.5
PASSIVE PROFIT (%): +63.3
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.8
% OF POSITIVE OPERATIONS: 33.3
% OF NEGATIVE OPERATIONS: 66.7
MAXIMUM PROFIT (%): +32.3
MINIMUM PROFIT (%): -2.0

MAXIMUM PROFIT STREAK (%): +34.3
MINIMUM PROFIT STREAK (%): -0.9
AVERAGE PROFIT/OPERATION (%): +10.5
MAXIMUM PROFIT/OPERATION (%): +34.3
MINIMUM PROFIT/OPERATION (%): -2.0
AVERAGE OPERATION DURATION (days): 211.3
MAXIMUM OPERATION DURATION (days): 368
MINIMUM OPERATION DURATION (days): 2
ACTIVE OPERATION TIME (%): 70.3

Volatility 15,96%

Average	(X-average)^2	Variance	Standard deviation
0,20566667	0,050925444	0,02547622	0,159612726
	0,013767111		
	0,011736111		

Visa

	Buy dates	Sale dates	Performance	Div:	Prfm. Div.	Days in operation	Cumulative prfm.
	10/06/2015	21/07/2015	8,90%		8,90%	28	8,90%
	22/08/2015	17/10/2015	1,70%		1,70%	39	10,60%
RSI14	15/12/2015	01/03/2016	-4,50%		-4,50%	51	6,10%
BUY 30	05/05/2016	04/06/2016	6,10%		6,10%	21	12,20%
SELL 70	24/06/2016	23/07/2016	4,60%		4,60%	20	16,80%
	23/03/2017	08/06/2017	3,80%	0,68%	4,48%	53	21,28%
	07/02/2018	28/04/2018	11,20%	0,68%	11,88%	56	33,16%
	12/10/2018	15/01/2019	2,20%		2,20%	63	35,36%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +34.0
PROFIT/YEAR (%): +8.4
COMPOUND PROFIT (%): +38.4
PASSIVE PROFIT (%): +96.1
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 87.5
% OF NEGATIVE OPERATIONS: 12.5
MAXIMUM PROFIT (%): +34.0
Volatility 4,62%

MAXIMUM PROFIT STREAK (%): +27.9
MINIMUM PROFIT STREAK (%): -4.5
AVERAGE PROFIT/OPERATION (%): +4.2
MAXIMUM PROFIT/OPERATION (%): +11.2
MINIMUM PROFIT/OPERATION (%): -4.5
AVERAGE OPERATION DURATION (days): 41.4
MAXIMUM OPERATION DURATION (days): 63
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 32.7
MINIMUM PROFIT (%): +6.1

Average	(X-average)^2	Variance	Standard deviation
0,0442	0,00200704	0,0021309	0,046161889
	0,00073984		
	0,00795664		
	0,00028224		
	3,24E-06		
	3,6E-07		
	0,00556516		
	0,00049284		

	Buy dates	Sale dates	Performance	Div:	Prfm. Div.	Days in operation	Cumulative prfm.
RSI14	07/04/2015	21/07/2015	10,10%		10,10%	73	10,10%
BUY35	20/08/2015	17/10/2015	-1,70%		-1,70%	41	8,40%
SELL80	11/12/2015	04/03/2016	-5,40%		-5,40%	56	3,00%
	22/03/2016	22/07/2016	9%	0,72%	9,72%	85	12,72%
	03/12/2016	22/02/2017	16,40%		16,40%	53	29,12%
	22/03/2017	14/10/2017	9,80%	1,29%	11,09%	144	40,21%
	01/12/2017	11/01/2018	5,90%		5,90%	27	46,11%
	07/02/2018	15/05/2018	18,30%	0,68%	18,98%	67	65,09%
	12/10/2018	25/01/2019	3,80%		3,80%	70	68,89%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +66.1
PROFIT/YEAR (%): +16.4
COMPOUND PROFIT (%): +85.3
PASSIVE PROFIT (%): +98.4
NUMBER OF OPERATIONS: 9
NUMBER OF OPERATIONS/YEAR: 2.2
% OF POSITIVE OPERATIONS: 77.8
% OF NEGATIVE OPERATIONS: 22.2
MAXIMUM PROFIT (%): +66.1
Volatility 7,47%

MAXIMUM PROFIT STREAK (%): +63.1
MINIMUM PROFIT STREAK (%): -7.1
AVERAGE PROFIT/OPERATION (%): +7.3
MAXIMUM PROFIT/OPERATION (%): +18.3
MINIMUM PROFIT/OPERATION (%): -5.4
AVERAGE OPERATION DURATION (days): 68.4
MAXIMUM OPERATION DURATION (days): 144
MINIMUM OPERATION DURATION (days): 27
ACTIVE OPERATION TIME (%): 60.8
MINIMUM PROFIT (%): +3.0

Average	(X-average)^2	Variance	Standard deviation
0,0765444	0,000598074	0,00559	0,07473
	0,008750563		
	0,017041852		
	0,000426652		
	0,007648474		
	0,001180304		
	0,000307808		
	0,012826821		
	0,001485674		

	Buy dates	Sale dates	Performance	Div:	Prfm. Div.	Days in operation	Cumulative prfm.
RSI14	25/08/2015	17/10/2015	18,60%		18,60%	38	18,60%
BUY25	05/05/2016	22/07/2016	7,10%	0,72%	7,82%	54	26,42%
SELL80	23/03/2017	14/10/2017	11,60%	1,29%	12,89%	143	39,31%
	12/10/2018	25/01/2019	3,80%		3,80%	70	43,11%

Average	(X-average)^2	Variance	Standard deviation
0,107775	0,006119151	0,0030772	0,055472172
	0,000874681		
	0,000446266		
	0,004868551		

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +41.1
PROFIT/YEAR (%): +10.2
COMPOUND PROFIT (%): +47.1
PASSIVE PROFIT (%): +112.1
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.0
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +41.1
Volatility 5,55%

MAXIMUM PROFIT STREAK (%): +22.5
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +10.3
MAXIMUM PROFIT/OPERATION (%): +18.6
MINIMUM PROFIT/OPERATION (%): +3.8
AVERAGE OPERATION DURATION (days): 76.2
MAXIMUM OPERATION DURATION (days): 143
MINIMUM OPERATION DURATION (days): 38
ACTIVE OPERATION TIME (%): 30.1
MINIMUM PROFIT (%): +18.6

	Buy dates	Sale dates	Performance	Div:	Prfm. Div.	Days in operation	Cumulative prfm.
RSI14	26/08/2015	17/10/2015	5,80%		5,80%	37	5,80%
BUY20	25/12/2018	25/01/2019	12,20%		12,20%	20	18,00%
SELL65							

Average	(X-average)^2	Variance	Standard deviation
0,09	0,001024	0,001024	0,032
	0,001024		

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +18.0
PROFIT/YEAR (%): +4.5
COMPOUND PROFIT (%): +18.7
PASSIVE PROFIT (%): +89.2
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +18.0
Volatility 3,20%

MAXIMUM PROFIT STREAK (%): +12.2
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +9.0
MAXIMUM PROFIT/OPERATION (%): +12.2
MINIMUM PROFIT/OPERATION (%): +5.8
AVERAGE OPERATION DURATION (days): 28.5
MAXIMUM OPERATION DURATION (days): 37
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 5.6
MINIMUM PROFIT (%): +5.8

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30-Jan-2015	09-Nov-2017	75,90%	1,40%	77,30%	701	77,30%
17-Nov-2017	30-Jan-2019	24,70%	1,89%	26,59%	300	103,89%

BUY45 Volatility 18,80%
SELL90

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +100.6
PROFIT/YEAR (%): +25.0
COMPOUND PROFIT (%): +119.4
PASSIVE PROFIT (%): +115.3
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +100.6
MINIMUM PROFIT (%): +75.9

MAXIMUM PROFIT STREAK (%): +24.7
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +50.3
MAXIMUM PROFIT/OPERATION (%): +75.9
MINIMUM PROFIT/OPERATION (%): +24.7
AVERAGE OPERATION DURATION (days): 500.5
MAXIMUM OPERATION DURATION (days): 701
MINIMUM OPERATION DURATION (days): 300
ACTIVE OPERATION TIME (%): 98.8

V

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30-Jan-2015	28-Feb-2015	1,80%		1,80%	20	1,80%
25-Mar-2015	23-Apr-2015	-1,30%		-1,30%	20	0,50%
30-Apr-2015	29-May-2015	4,40%		4,40%	20	4,90%
05-Jun-2015	07-Jul-2015	-1,20%		-1,20%	21	3,70%
10-Jul-2015	07-Aug-2015	11,70%		11,70%	20	15,40%
14-Aug-2015	15-Sep-2015	-5,90%		-5,90%	21	9,50%
18-Sep-2015	16-Oct-2015	4,40%		4,40%	20	13,90%
05-Dec-2015	02-Feb-2016	-6,60%		-6,60%	38	7,30%
03-Feb-2016	03-Mar-2016	0,90%		0,90%	20	8,20%
11-Mar-2016	09-Apr-2016	6,90%		6,90%	20	15,10%
03-May-2016	01-Jun-2016	5,20%		5,20%	20	20,30%
15-Jun-2016	14-Jul-2016	-0,50%		-0,50%	20	19,80%
04-Aug-2016	01-Sep-2016	2,30%		2,30%	20	22,10%
28-Sep-2016	26-Oct-2016	3,80%		3,80%	20	25,90%
03-Nov-2016	17-Dec-2016	3,30%		3,30%	31	29,20%
31-Dec-2016	01-Feb-2017	1,50%		1,50%	20	30,70%
02-Feb-2017	03-Mar-2017	9,00%		9,00%	20	39,70%
22-Mar-2017	20-Apr-2017	0,60%		0,60%	20	40,30%
03-May-2017	06-Jun-2017	1,10%		1,10%	23	41,40%
14-Jun-2017	19-Jul-2017.	-1,00%		-1,00%	24	40,40%
20-Jul-2017	17-Aug-2017	2,00%		2,00%	20	42,40%
06-Sep-2017	04-Oct-2017	2,70%		2,70%	20	45,10%
17-Nov-2017	16-Dec-2017	2,10%		2,10%	20	47,20%
04-Jan-2018	02-Feb-2018	3,20%		3,20%	20	50,40%
06-Feb-2018	07-Mar-2018	2,10%		2,10%	20	52,50%
16-Mar-2018	14-Apr-2018	-2,30%		-2,30%	20	50,20%
27-Jun-2018	26-Jul-2018	4,40%		4,40%	20	54,60%
01-Aug-2018	29-Aug-2018	5,20%		5,20%	20	59,80%
07-Sep-2018	05-Oct-2018	4,00%		4,00%	20	63,80%
09-Oct-2018	06-Nov-2018	-3,90%		-3,90%	20	59,90%
07-Nov-2018	12-Dec-2018	0,10%		0,10%	23	60,00%
18-Dec-2018	17-Jan-2019	1,70%		1,70%	20	61,70%
30-Jan-2019	20-Feb-2019	5,60%		5,60%	15	67,30%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +76.3
PROFIT/YEAR (%): +18.7
COMPOUND PROFIT (%): +107.3
PASSIVE PROFIT (%): +132.3
NUMBER OF OPERATIONS: 33
NUMBER OF OPERATIONS/YEAR: 8.1
% OF POSITIVE OPERATIONS: 75.8
% OF NEGATIVE OPERATIONS: 24.2
MAXIMUM PROFIT (%): +76.3
MINIMUM PROFIT (%): +9.5

MAXIMUM PROFIT STREAK (%): +66.9
MINIMUM PROFIT STREAK (%): -1.3
AVERAGE PROFIT/OPERATION (%): +2.3
MAXIMUM PROFIT/OPERATION (%): +11.7
MINIMUM PROFIT/OPERATION (%): -6.6
AVERAGE OPERATION DURATION (days): 21.1
MAXIMUM OPERATION DURATION (days): 38
MINIMUM OPERATION DURATION (days): 15
ACTIVE OPERATION TIME (%): 67.8

Volatility 21,10%

50.50

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
29-Jan-2015	22-Jul-2015	18,00%		18,00%	120	18,00%
08-Aug-2015	22-Jul-2016	5,80%	0,72%	6,52%	240	24,52%
02-Aug-2016	14-Oct-2017	29,80%	2,64%	32,44%	304	56,96%
21-Oct-2017	15-May-2018	21,10%		21,10%	140	78,06%
27-Jun-2018	18-Aug-2018	8,20%		8,20%	37	86,26%
07-Sep-2018	30-Jan-2019	-5,30%		-5,30%	99	80,96%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +77.6
PROFIT/YEAR (%): +19.3
COMPOUND PROFIT (%): +101.0
PASSIVE PROFIT (%): +110.0
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.5
% OF POSITIVE OPERATIONS: 83.3
% OF NEGATIVE OPERATIONS: 16.7
MAXIMUM PROFIT (%): +82.8
MINIMUM PROFIT (%): +18.0

MAXIMUM PROFIT STREAK (%): +64.8
MINIMUM PROFIT STREAK (%): -5.3
AVERAGE PROFIT/OPERATION (%): +12.9
MAXIMUM PROFIT/OPERATION (%): +29.8
MINIMUM PROFIT/OPERATION (%): -5.3
AVERAGE OPERATION DURATION (days): 156.7
MAXIMUM OPERATION DURATION (days): 304
MINIMUM OPERATION DURATION (days): 37
ACTIVE OPERATION TIME (%): 92.8

Volatility 29,83%

There is not any operations for strategies 10-60 and 10-50.

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
31/03/2015	30/05/2015	2,80%		2,80%	42	2,80%
19/06/2015	17/05/2015	5,80%		5,80%	19	8,60%
25/08/2015	10/10/2015	17,40%		17,40%	33	26,00%
10/12/2015	02/03/2016	-7,20%		-7,20%	55	18,80%
13/05/2016	04/06/2016	3,30%		3,30%	15	22,10%
23/06/2016	26/07/2016	5,50%	0,72%	6,22%	22	28,32%
25/08/2016	01/09/2016	0,10%	0,68%	0,78%	5	29,10%
20/10/2016	26/10/2016	1,70%		1,70%	4	30,80%
03/11/2016	05/01/2017	2,80%		2,80%	42	33,60%
23/03/2017	22/06/2017	3,10%		3,10%	63	36,70%
29/06/2017	01/08/2017	-0,30%		-0,30%	22	36,40%
27/09/2017	03/10/2017	1,80%	1,24%	3,04%	4	39,44%
29/11/2017	09/01/2018	3,30%		3,30%	7	42,74%
09/02/2018	15/03/2018	1,80%		1,80%	23	44,54%
28/03/2018	28/04/2018	5,60%		5,60%	22	50,14%
27/06/2018	08/08/2018	5,40%		5,40%	19	55,54%
11/08/2018	06/09/2018	3,10%		3,10%	17	58,64%
07/09/2018	01/12/2018	-2,10%		-2,10%	60	56,54%
12/12/2018	19/01/2019	-2,80%		-2,80%	26	53,74%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +51.0
PROFIT/YEAR (%): +12.5
COMPOUND PROFIT (%): +62.3
PASSIVE PROFIT (%): +110.7
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 4.7
% OF POSITIVE OPERATIONS: 78.9
% OF NEGATIVE OPERATIONS: 21.1
MAXIMUM PROFIT (%): +55.9
MINIMUM PROFIT (%): +2.8

MAXIMUM PROFIT STREAK (%): +53.1
MINIMUM PROFIT STREAK (%): -4.8
AVERAGE PROFIT/OPERATION (%): +2.7
MAXIMUM PROFIT/OPERATION (%): +17.4
MINIMUM PROFIT/OPERATION (%): -7.2
AVERAGE OPERATION DURATION (days): 27.9
MAXIMUM OPERATION DURATION (days): 63
MINIMUM OPERATION DURATION (days): 4
ACTIVE OPERATION TIME (%): 51.7

Volatility 15,29%

Average	(X-average)^2	Variance	Standard deviation
35,50%	0,106942769	0,02336597	0,152859309
	0,072372327		
	0,009029		
	0,027896032		
	0,017961643		
	0,005158264		
	0,004098695		
	0,002210979		
	0,0003618		
	0,000143495		
	8,06215E-05		
	0,001550701		
	0,005238712		
	0,008168354		
	0,021426796		
	0,040151723		
	0,053536217		
	0,044259301		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	04/03/2015	4,30%		4,30%	7	4,30%
08/04/2015	04/08/2015	13,20%		13,20%	82	17,50%
27/08/2015	31/10/2015	16,10%		16,10%	46	33,60%
18/12/2015	12/04/2016	-7,90%	0,68%	-7,22%	77	26,38%
21/05/2016	22/02/2017	19,30%	0,72%	20,02%	189	46,40%
28/03/2017	15/11/2017	14,80%		14,80%	162	61,20%
17/11/2017	17/05/2018	17,10%	1,89%	18,99%	123	80,19%
03/07/2018	15/02/2019	10,70%		10,70%	156	90,89%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +87.6
PROFIT/YEAR (%): +21.8
COMPOUND PROFIT (%): +124.1
PASSIVE PROFIT (%): +117.1
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 87.5
% OF NEGATIVE OPERATIONS: 12.5
MAXIMUM PROFIT (%): +87.6
MINIMUM PROFIT (%): +4.3

MAXIMUM PROFIT STREAK (%): +83.3
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +10.9
MAXIMUM PROFIT/OPERATION (%): +19.3
MINIMUM PROFIT/OPERATION (%): -7.9
AVERAGE OPERATION DURATION (days): 105.2
MAXIMUM OPERATION DURATION (days): 189
MINIMUM OPERATION DURATION (days): 7
ACTIVE OPERATION TIME (%): 83.2

Volatility 28,50%

Average	(X-average)^2	Variance	Standard deviation
45,06%	0,166117381	0,08122508	0,285000135
	0,075941581		
	0,013127431		
	0,034884901		
	0,000180231		
	0,026058031		
	0,123429256		
	0,210061806		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30/07/2015	04/08/2015	0,10%		0,10%	3	0,10%
18/02/2015	23/09/2016	14,40%	2,94%	17,34%	152	17,44%
16/12/2016	26/01/2017	1,30%		1,30%	26	18,74%
05/08/2017	25/01/2018	17,80%	1,24%	19,04%	118	37,78%
29/03/2018	16/05/2018	15,30%	1,89%	17,19%	33	54,97%
08/12/2018	27/02/2019	3,20%		3,20%	54	58,17%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): +52.1
PROFIT/YEAR (%): +14.5
COMPOUND PROFIT (%): +62.7
PASSIVE PROFIT (%): +88.1
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +52.1
MINIMUM PROFIT (%): +0.1

MAXIMUM PROFIT STREAK (%): +52.0
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +8.7
MAXIMUM PROFIT/OPERATION (%): +17.8
MINIMUM PROFIT/OPERATION (%): +0.1
AVERAGE OPERATION DURATION (days): 64.3
MAXIMUM OPERATION DURATION (days): 152
MINIMUM OPERATION DURATION (days): 3
ACTIVE OPERATION TIME (%): 42.8

Volatility 21,01%

Average	(X-average)^2	Variance	Standard deviation
31,20%	9,67%	4,41%	0,210059095
	1,89%		
	1,55%		
	0,43%		
	5,65%		
	7,27%		

Mastercard.

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	22/08/2015	17/10/2015	1,90%		1,90%	39	1,90%
BUY 30	15/12/2015	01/03/2016	-8,30%		-8,30%	51	-6,40%
SELL 70	15/06/2016	22/07/2016	-0,30%		-0,30%	26	-6,70%
	27/08/2016	05/10/2016	6,20%		6,20%	26	-0,50%
	03/02/2017	04/03/2017	7,60%	0,83%	8,43%	20	7,93%
	23/03/2017	07/06/2017	7,30%	0,71%	8,01%	52	15,94%
	04/01/2018	02/03/2018	12,30%		12,30%	39	28,24%
	12/10/2018	13/01/2019	-0,10%	0,50%	0,40%	63	28,64%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +26.6
PROFIT/YEAR (%): +6.5
COMPOUND PROFIT (%): +28.2
PASSIVE PROFIT (%): +132.8
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 62.5
% OF NEGATIVE OPERATIONS: 37.5
MAXIMUM PROFIT (%): +26.7
volatility 6,07%

MAXIMUM PROFIT STREAK (%): +33.5
MINIMUM PROFIT STREAK (%): -8.6
AVERAGE PROFIT/OPERATION (%): +3.3
MAXIMUM PROFIT/OPERATION (%): +12.3
MINIMUM PROFIT/OPERATION (%): -8.3
AVERAGE OPERATION DURATION (days): 39.5
MAXIMUM OPERATION DURATION (days): 63
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 30.8
MINIMUM PROFIT (%): -6.7

Average	(X-average)^2	Variance	Standard deviation
0,0358	0,03%	0,00368967	0,060742674
	1,41%		
	0,15%		
	0,07%		
	0,24%		
	0,20%		
	0,76%		
	0,10%		

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	10/06/2015	11/11/2015	13,70%		13,70%	108	13,70%
BUY35	12/12/2015	04/03/2016	-9,10%		-9,10%	55	4,60%
SELL80	06/05/2016	27/07/2016	-1%		-1,00%	56	3,60%
	26/08/2016	01/11/2016	14,70%	0,73%	15,43%	46	19,03%
	03/02/2017	08/06/2017	13,40%	1,54%	14,94%	86	33,97%
	04/01/2018	02/03/2018	12,30%	0,59%	12,89%	39	46,86%
	30/03/2018	11/05/2018	13,80%	0,50%	14,30%	29	61,16%
	12/10/2018	25/01/2019	3,40%		3,40%	70	64,56%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +61.3
PROFIT/YEAR (%): +15.1
COMPOUND PROFIT (%): +76.0
PASSIVE PROFIT (%): +138.7
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 75.0
% OF NEGATIVE OPERATIONS: 25.0
MAXIMUM PROFIT (%): +61.3
volatility 8,62%

MAXIMUM PROFIT STREAK (%): +57.7
MINIMUM PROFIT STREAK (%): -10.1
AVERAGE PROFIT/OPERATION (%): +7.7
MAXIMUM PROFIT/OPERATION (%): +14.7
MINIMUM PROFIT/OPERATION (%): -9.1
AVERAGE OPERATION DURATION (days): 61.1
MAXIMUM OPERATION DURATION (days): 108
MINIMUM OPERATION DURATION (days): 29
ACTIVE OPERATION TIME (%): 47.7
MINIMUM PROFIT (%): +3.6

Average	(X-average)^2	Variance	Standard deviation
0,0807	0,32%	0,007425	0,086167816
	2,95%		
	0,82%		
	0,54%		
	0,47%		
	0,23%		
	0,39%		
	0,22%		

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	25/08/2015	11/11/2015	25,10%		25,10%	55	25,10%
BUY25	21/01/2016	04/03/2016	4,20%		4,20%	30	29,30%
SELL80	23/03/2017	08/06/2017	7,40%	0,71%	8,11%	53	37,41%
	12/10/2018	25/01/2019	3,40%		3,40%	70	40,81%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +40.2
PROFIT/YEAR (%): +9.9
COMPOUND PROFIT (%): +44.9
PASSIVE PROFIT (%): +162.6
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.0
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +40.2
volatility 8,78%

MAXIMUM PROFIT STREAK (%): +15.0
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +10.0
MAXIMUM PROFIT/OPERATION (%): +25.1
MINIMUM PROFIT/OPERATION (%): +3.4
AVERAGE OPERATION DURATION (days): 52.0
MAXIMUM OPERATION DURATION (days): 70
MINIMUM OPERATION DURATION (days): 30
ACTIVE OPERATION TIME (%): 20.3
MINIMUM PROFIT (%): +25.1

Average	(X-average)^2	Variance	Standard deviation
0,102025	0,022193551	0,00771545	0,087837645
	0,003603001		
	0,000437856		
	0,004627401		

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	25/08/2015	17/10/2015	15%		15%	38	15,00%
BUY20	25/12/2018	25/01/2019	14,50%		15%	20	29,50%
SELL65							

Average	(X-average)^2	Variance	Standard deviation
0,1475	6,25E-06	6,25E-06	0,0025
	6,25E-06		

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +29.5
PROFIT/YEAR (%): +7.3
COMPOUND PROFIT (%): +31.7
PASSIVE PROFIT (%): +162.6
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +29.5
volatility 0,25%

MAXIMUM PROFIT STREAK (%): +14.5
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +14.8
MAXIMUM PROFIT/OPERATION (%): +15.0
MINIMUM PROFIT/OPERATION (%): +14.5
AVERAGE OPERATION DURATION (days): 29.0
MAXIMUM OPERATION DURATION (days): 38
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 5.7
MINIMUM PROFIT (%): +15.0

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	26/03/2015	15/05/2018	97,50%	5,32%	102,82%	790	102,82%
BUY45	27/06/2018	15/02/2019	14,60%	1,58%	16,18%	161	119,00%
SELL90							

BUY45
SELL90

Volatility 11,44%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +112.0
PROFIT/YEAR (%): +27.5
COMPOUND PROFIT (%): +126.2
PASSIVE PROFIT (%): +137.1
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +112.0

MAXIMUM PROFIT STREAK (%): +14.6
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +56.0
MAXIMUM PROFIT/OPERATION (%): +97.5
MINIMUM PROFIT/OPERATION (%): +14.6
AVERAGE OPERATION DURATION (days): 475.5
MAXIMUM OPERATION DURATION (days): 790
MINIMUM OPERATION DURATION (days): 161
ACTIVE OPERATION TIME (%): 92.8
MINIMUM PROFIT (%): +97.5

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30-Jan-2015	28-Feb-2015	13,70%		13,70%	20	13,70%
25-Mar-2015	23-Apr-2015	-0,40%		-0,40%	20	13,30%
29-Apr-2015	28-May-2015	2,40%		2,40%	20	15,70%
10-Jun-2015	09-Jul-2015 2	2,40%		2,40%	20	18,10%
10-Jul-2015	07-Aug-2015 :	5,50%		5,50%	20	23,60%
08-Aug-2015	15-Sep-2015	-10,10%		-10,10%	25	13,50%
18-Sep-2015	16-Oct-2015	2,90%		2,90%	20	16,40%
28-Nov-2015	31-Dec-2015	-2,60%		-2,60%	22	13,80%
06-Jan-2016	19-Feb-2016	-13,20%		-13,20%	30	0,60%
20-Feb-2016	19-Mar-2016	4,50%		4,50%	20	5,10%
22-Mar-2016	20-Apr-2016	4,50%		4,50%	20	9,60%
04-May-2016	02-Jun-2016	0,60%		0,60%	20	10,20%
09-Jun-2016	16-Jul-2016 2	-3,20%		-3,20%	26	7,00%
18-Aug-2016	16-Sep-2016	2,40%		2,40%	20	9,40%
16-Nov-2016	17-Dec-2016	5,50%		5,50%	22	14,90%
31-Dec-2016	01-Feb-2017	-1,10%		-1,10%	20	13,80%
02-Feb-2017	03-Mar-2017	6,80%		6,80%	20	20,60%
16-Mar-2017	13-Apr-2017	0,20%		0,20%	20	20,80%
21-Apr-2017	26-May-2017	1,50%		1,50%	25	22,30%
23-Jun-2017	22-Jul-2017 2	-0,70%		-0,70%	20	21,60%
02-Aug-2017	30-Aug-2017	1,10%		1,10%	20	22,70%
06-Sep-2017	04-Oct-2017	7,50%		7,50%	20	30,20%
17-Nov-2017	16-Dec-2017	1,60%		1,60%	20	31,80%
30-Dec-2017	31-Jan-2018	4,80%		4,80%	20	36,60%
07-Feb-2018	08-Mar-2018	8,20%		8,20%	20	44,80%
24-Mar-2018	24-Apr-2018	1,10%		1,10%	20	45,90%
26-Apr-2018	24-May-2018	13,40%		13,40%	20	59,30%
27-Jun-2018	26-Jul-2018 2	5,20%		5,20%	20	64,50%
01-Aug-2018	29-Aug-2018	5,40%		5,40%	20	69,90%
09-Oct-2018	09-Nov-2018	-2,00%		-2,00%	23	67,90%
15-Nov-2018	15-Dec-2018	-3,40%		-3,40%	20	64,50%
19-Dec-2018	18-Jan-2019	1,70%		1,70%	20	66,20%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +65.9
PROFIT/YEAR (%): +16.1
COMPOUND PROFIT (%): +83.4
PASSIVE PROFIT (%): +173.5
NUMBER OF OPERATIONS: 32
NUMBER OF OPERATIONS/YEAR: 7.8
% OF POSITIVE OPERATIONS: 71.9
% OF NEGATIVE OPERATIONS: 28.1
MAXIMUM PROFIT (%): +69.6
MINIMUM PROFIT (%): +0.5

MAXIMUM PROFIT STREAK (%): +69.1
MINIMUM PROFIT STREAK (%): -23.1
AVERAGE PROFIT/OPERATION (%): +2.1
MAXIMUM PROFIT/OPERATION (%): +13.7
MINIMUM PROFIT/OPERATION (%): -13.2
AVERAGE OPERATION DURATION (days): 21.0
MAXIMUM OPERATION DURATION (days): 30
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 65.5
Volatility 21,01%

50.50

	Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
RSI14	23/01/2015	28/02/2015	9,60%		9,60%	25	9,60%
BUY55	19/03/2015	10/09/2015	7,70%		7,70%	374	17,30%
SELL85	01/10/2016	01/11/2016	8%		8,00%	21	25,30%
	08/11/2016	23/02/2017	8,90%	1,56%	10,46%	72	35,76%
	14/03/2017	08/06/2017	5,70%	0,71%	6,41%	60	42,17%
	17/11/2017	02/03/2018	12,70%		12,70%	70	54,87%
	24/03/2018	15/05/2018	12,50%	0,50%	13,00%	35	67,87%
	02/06/2018	15/02/2019	17,50%	1,58%	19,08%	178	86,95%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +96.9
PROFIT/YEAR (%): +23.8
COMPOUND PROFIT (%): +149.8
PASSIVE PROFIT (%): +163.9
NUMBER OF OPERATIONS: 9
NUMBER OF OPERATIONS/YEAR: 2.2
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +96.9
Volatility 26,27%

MAXIMUM PROFIT STREAK (%): +87.3
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +10.8
MAXIMUM PROFIT/OPERATION (%): +17.5
MINIMUM PROFIT/OPERATION (%): +5.7
AVERAGE OPERATION DURATION (days): 102.3
MAXIMUM OPERATION DURATION (days): 374
MINIMUM OPERATION DURATION (days): 21
ACTIVE OPERATION TIME (%): 89.9
MINIMUM PROFIT (%): +9.6

There is not any operations for strategies 10-60 and 10-50.

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
01/04/2015	09/06/2015	-0,30%		-0,30%	47	-0,30%
10/06/2015	09/07/2015	2,40%		2,40%	2034	2,10%
19/08/2015	07/11/2015	-6,80%		-6,80%	58	-4,70%
05/12/2015	02/03/2016	-9,60%		-9,60%	50	-14,30%
18/05/2016	29/07/2016	0%		0,00%	50	-14,30%
01/12/2016	10/01/2017	3,10%	1,56%	4,66%	26	-9,64%
21/01/2017	04/03/2017	2,30%		2,30%	29	-7,34%
25/03/2017	28/04/2017	2,30%	0,71%	3,01%	23	-4,33%
20/05/2017	07/06/2017	4,90%		4,90%	11	0,57%
04/07/2017	05/08/2017	0,90%		0,90%	23	1,47%
16/08/2017	17/08/2017	-0,70%		-0,70%	1	0,77%
16/11/2017	12/01/2018	4%		4,00%	38	4,77%
28/03/2018	04/05/2018	6,10%	0,50%	6,60%	26	11,37%
27/06/2018	06/09/2018	9,10%		9,10%	49	20,47%
11/10/2018	05/12/2018	-0,30%		-0,30%	38	20,17%
14/12/2018	19/01/2019	-1,10%	1,58%	0,48%	24	20,65%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +16.4
PROFIT/YEAR (%): +4.0
COMPOUND PROFIT (%): +15.9
PASSIVE PROFIT (%): +140.8
NUMBER OF OPERATIONS: 16
NUMBER OF OPERATIONS/YEAR: 3.9
% OF POSITIVE OPERATIONS: 62.5
% OF NEGATIVE OPERATIONS: 37.5
MAXIMUM PROFIT (%): +17.8
MINIMUM PROFIT (%): -14.3

MAXIMUM PROFIT STREAK (%): +32.0
MINIMUM PROFIT STREAK (%): -16.4
AVERAGE PROFIT/OPERATION (%): +1.0
MAXIMUM PROFIT/OPERATION (%): +9.1
MINIMUM PROFIT/OPERATION (%): -9.6
AVERAGE OPERATION DURATION (days): 31.1
MAXIMUM OPERATION DURATION (days): 58
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 48.5

Volatility 11,07%

Average	(X-average)^2	Variance	Standard deviation
1,71%	0,000405771	0,01225925	0,110721486
	1,48707E-05		
	0,004114421		
	0,025646021		
	0,025646021		
	0,012892183		
	0,008198171		
	0,003653447		
	0,000130959		
	5,97191E-06		
	8,91844E-05		
	0,000933684		
	0,009323109		
	0,035177347		
	0,034061009		
	0,035855789		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	28/02/2015	2,70%		2,70%	5	2,70%
17/04/2015	31/10/2015	9,80%		9,80%	138	12,50%
16/12/2015	31/03/2016	-8,30%		-8,30%	71	4,20%
02/06/2016	12/10/2016	7,20%		7,20%	92	11,40%
08/11/2016	07/10/2017	28,50%	1,56%	30,06%	230	41,46%
11/11/2017	24/05/2018	26,30%	1,09%	27,39%	132	68,85%
03/07/2018	12/02/2019	13,40%	1,58%	14,98%	153	83,83%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +79.6
PROFIT/YEAR (%): +19.8
COMPOUND PROFIT (%): +104.0
PASSIVE PROFIT (%): +150.0
NUMBER OF OPERATIONS: 7
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 85.7
% OF NEGATIVE OPERATIONS: 14.3
MAXIMUM PROFIT (%): +79.6
MINIMUM PROFIT (%): +2.7

MAXIMUM PROFIT STREAK (%): +76.9
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +11.4
MAXIMUM PROFIT/OPERATION (%): +28.5
MINIMUM PROFIT/OPERATION (%): -8.3
AVERAGE OPERATION DURATION (days): 117.3
MAXIMUM OPERATION DURATION (days): 230
MINIMUM OPERATION DURATION (days): 5
ACTIVE OPERATION TIME (%): 81.1

Volatility 30,64%

Average	(X-average)^2	Variance	Standard deviation
32,13%	0,086637718	0,0938511	0,306351264
	0,038550518		
	0,078032432		
	0,04299106		
	0,008696895		
	0,134804368		
	0,267244688		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30/07/2015	05/08/2015	3,10%		3,10%	4	3,10%
15/10/2015	24/10/2015	6,40%		6,40%	7	9,50%
20/01/2016	08/09/2016	5,80%	1,56%	7,36%	161	16,86%
08/07/2017	01/11/2017	20,70%		20,70%	87	37,56%
07/11/2018	27/02/2019	12,30%	1,58%	13,88%	75	51,44%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): +48.3
PROFIT/YEAR (%): +13.4
COMPOUND PROFIT (%): +57.3
PASSIVE PROFIT (%): +127.8
NUMBER OF OPERATIONS: 5
NUMBER OF OPERATIONS/YEAR: 1.4
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +48.3
MINIMUM PROFIT (%): +3.1

MAXIMUM PROFIT STREAK (%): +45.1
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +9.7
MAXIMUM PROFIT/OPERATION (%): +20.7
MINIMUM PROFIT/OPERATION (%): +3.1
AVERAGE OPERATION DURATION (days): 65.6
MAXIMUM OPERATION DURATION (days): 161
MINIMUM OPERATION DURATION (days): 4
ACTIVE OPERATION TIME (%): 36.4

Volatility 18,08%

Average	(X-average)^2	Variance	Standard deviation
23,69%	0,042403046	0,03268785	0,180797814
	0,020141286		
	0,004667622		
	0,019232142		
	0,07699515		

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	12/02/2015	16/04/2015	13,70%		13,70%	43	13,70%
BUY 30	17/06/2015	21/07/2015	7,90%		7,90%	23	21,60%
SELL 70	18/08/2015	04/11/2015	-8,20%		-8,20%	55	13,40%
	09/12/2015	27/02/2016	-0,90%		-0,90%	54	12,50%
	23/06/2016	04/08/2016	12,10%		12,10%	29	24,60%
	27/08/2016	19/11/2016	0,30%	3,74%	4,04%	59	28,64%
	25/01/2017	23/02/2017	2%	4,15%	6,15%	20	34,79%
	20/04/2017	10/06/2017	2,10%	3,59%	5,69%	36	40,48%
	14/07/2017	31/08/2017	-2,90%	3,32%	0,42%	34	40,90%
	24/03/2018	28/04/2018	-0,80%		-0,80%	24	40,10%
	09/06/2018	17/08/2018	1,20%	4,03%	5,23%	48	45,33%
	06/09/2018	10/10/2018	0,50%		0,50%	24	45,83%
	24/10/2018	21/11/2018	7,70%	4,63%	12,33%	20	58,16%
	22/12/2018	15/02/2019	-4,50%	5,32%	0,82%	37	58,98%

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NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +30.3
PROFIT/YEAR (%): +7.4
COMPOUND PROFIT (%): +31.8
PASSIVE PROFIT (%): +39.6
NUMBER OF OPERATIONS: 14
NUMBER OF OPERATIONS/YEAR: 3.4
% OF POSITIVE OPERATIONS: 64.3
% OF NEGATIVE OPERATIONS: 35.7
MAXIMUM PROFIT (%): +34.8

Volatility 15,05%

MAXIMUM PROFIT STREAK (%): +22.3
MINIMUM PROFIT STREAK (%): -9.1
AVERAGE PROFIT/OPERATION (%): +2.2
MAXIMUM PROFIT/OPERATION (%): +13.7
MINIMUM PROFIT/OPERATION (%): -8.2
AVERAGE OPERATION DURATION (days): 36.1
MAXIMUM OPERATION DURATION (days): 59
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 49.4
MINIMUM PROFIT (%): +12.4

Average	(X-average)^2	Variance	Standard deviation
0,34215	0,042086523	0,02265972	0,150531457
	0,015913823		
	0,043326423		
	0,047154123		
	0,009244823		
	0,003108063		
	3,30625E-05		
	0,003925022		
	0,004468922		
	0,003463322		
	0,012354323		
	0,013490823		
	0,057336303		
	0,061330523		

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	07/02/2015	23/04/2015	16,90%		16,90%	51	16,90%
BUY35	15/05/2015	12/11/2915	-0,90%		-0,90%	126	16,00%
SELL80	02/12/2015	14/07/2016	5,60%		5,60%	154	21,60%
	26/08/2016	29/12/2016	3,20%	3,74%	6,94%	86	28,54%
	25/01/2017	10/03/2017	5,80%	4,15%	9,95%	31	38,49%
	31/03/2017	13/06/2017	0,30%	3,59%	3,89%	50	42,38%
	14/07/2017	06/09/2017	-0,80%	3,32%	2,52%	37	44,90%
	30/11/2017	30/01/2018	20,50%		20,50%	40	65,40%
	16/02/2018	15/05/2018	-4,70%	3,94%	-0,76%	60	64,64%
	05/06/2018	15/02/2019	-16,30%	13,98%	-2,32%	177	62,32%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +34.5	0,06232	0,011380622	0,0052426	0,072405826
TOTAL PROFIT (%): +29.5	MINIMUM PROFIT STREAK (%): -21.0		0,005086542		
PROFIT/YEAR (%): +7.2	AVERAGE PROFIT/OPERATION (%): +2.9		3,99424E-05		
COMPOUND PROFIT (%): +27.6	MAXIMUM PROFIT/OPERATION (%): +20.5		5,01264E-05		
PASSIVE PROFIT (%): +40.7	MINIMUM PROFIT/OPERATION (%): -16.3		0,001382352		
NUMBER OF OPERATIONS: 10	AVERAGE OPERATION DURATION (days): 81.2		0,000548496		
NUMBER OF OPERATIONS/YEAR: 2.5	MAXIMUM OPERATION DURATION (days): 177		0,001377894		
% OF POSITIVE OPERATIONS: 60.0	MINIMUM OPERATION DURATION (days): 31		0,020357582		
% OF NEGATIVE OPERATIONS: 40.0	ACTIVE OPERATION TIME (%): 79.2		0,004888806		
MAXIMUM PROFIT (%): +50.5	**MINIMUM PROFIT (%): +15.9**		0,00731367		

Volatility 7,24%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	18/08/2015	12/11/2015	-7,80%		-7,80%	61	-7,80%
BUY25	11/12/2015	14/07/2016	13,20%		13,20%	147	5,40%
SELL80	30/08/2016	29/12/2016	2,60%	3,74%	6,34%	84	11,74%
	26/01/2017	10/03/2017	6,60%	4,15%	10,75%	30	22,49%
	21/04/2017	13/06/2017	3,80%	3,59%	7,39%	36	29,88%
	04/08/2017	06/09/2017	5,40%	3,32%	8,72%	22	38,60%
	24/03/2018	15/05/2018	7,90%	3,94%	11,84%	35	50,44%
	06/07/2018	15/02/2019	-12,70%	13,98%	1,28%	155	51,72%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +39.5	0,06465	0,020349023	0,00411179	0,064123202
TOTAL PROFIT (%): +19.0	MINIMUM PROFIT STREAK (%): -12.7		0,004536023		
PROFIT/YEAR (%): +4.7	AVERAGE PROFIT/OPERATION (%): +2.4		1,5625E-06		
COMPOUND PROFIT (%): +17.6	MAXIMUM PROFIT/OPERATION (%): +13.2		0,001836123		
PASSIVE PROFIT (%): +13.9	MINIMUM PROFIT/OPERATION (%): -12.7		8,55625E-05		
NUMBER OF OPERATIONS: 8	AVERAGE OPERATION DURATION (days): 71.2		0,000508503		
NUMBER OF OPERATIONS/YEAR: 2.0	MAXIMUM OPERATION DURATION (days): 155		0,002889063		
% OF POSITIVE OPERATIONS: 75.0	MINIMUM OPERATION DURATION (days): 22		0,002688423		
% OF NEGATIVE OPERATIONS: 25.0	ACTIVE OPERATION TIME (%): 55.6				
MAXIMUM PROFIT (%): +31.7	**MINIMUM PROFIT (%): -7.8**				

Volatility 6,41%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative prfm.
RSI14	25/08/2015	03/11/2015	4,90%		4,90%	49	4,90%
BUY20	15/12/2015	27/02/2016	3,40%		3,40%	50	8,30%
SELL65	02/09/2016	18/11/2016	0,60%	3,74%	4,34%	54	12,64%
	29/03/2018	28/04/2018	6,40%		6,40%	21	19,04%
	06/09/2018	10/10/2018	0,50%		0,50%	24	19,54%
	26/10/2018	10/01/2019	10,30%	4,63%	14,93%	50	34,47%

		Average	(X-average)^2	Variance	Standard deviation
NUMBER OF YEARS: 4.1	MAXIMUM PROFIT STREAK (%): +21.3	0,05745	7,14025E-05	0,00200817	0,044812638
TOTAL PROFIT (%): +26.2	MINIMUM PROFIT STREAK (%): +0.0		0,000549903		
PROFIT/YEAR (%): +6.4	AVERAGE PROFIT/OPERATION (%): +4.4		0,000197403		
COMPOUND PROFIT (%): +28.8	MAXIMUM PROFIT/OPERATION (%): +10.3		4,29025E-05		
PASSIVE PROFIT (%): +34.0	MINIMUM PROFIT/OPERATION (%): +0.5		0,002751003		
NUMBER OF OPERATIONS: 6	AVERAGE OPERATION DURATION (days): 41.3		0,008436423		
NUMBER OF OPERATIONS/YEAR: 1.5	MAXIMUM OPERATION DURATION (days): 54				
% OF POSITIVE OPERATIONS: 100.0	MINIMUM OPERATION DURATION (days): 21				
% OF NEGATIVE OPERATIONS: 0.0	ACTIVE OPERATION TIME (%): 24.2				
MAXIMUM PROFIT (%): +26.2	**MINIMUM PROFIT (%): +4.9**				

Volatility 4,48%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30-Jan-2015	24-Apr-2015	9,10%		9,10%	58	9,10%
08-May-2015	20-Jun-2017	11,90%	7,89%	19,79%	533	28,89%
08-Jul-2017	09-Sep-2017	6,10%		6,10%	44	34,99%
08-Nov-2017	24-May-2018	11,80%	3,59%	15,39%	135	50,38%
02-Jun-2018	30-Jan-2019	-20,10%	13,98%	-6,12%	166	44,26%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +18.7
PROFIT/YEAR (%): +4.6
COMPOUND PROFIT (%): +15.6
PASSIVE PROFIT (%): +22.6
NUMBER OF OPERATIONS: 5
NUMBER OF OPERATIONS/YEAR: 1.2
% OF POSITIVE OPERATIONS: 80.0
% OF NEGATIVE OPERATIONS: 20.0
MAXIMUM PROFIT (%): +38.8
MINIMUM PROFIT (%): +9.1

MAXIMUM PROFIT STREAK (%): +29.7
MINIMUM PROFIT STREAK (%): -20.1
AVERAGE PROFIT/OPERATION (%): +3.7
MAXIMUM PROFIT/OPERATION (%): +11.9
MINIMUM PROFIT/OPERATION (%): -20.1
AVERAGE OPERATION DURATION (days): 187.2
MAXIMUM OPERATION DURATION (days): 533
MINIMUM OPERATION DURATION (days): 44
ACTIVE OPERATION TIME (%): 92.4

Volatility 15,97%

BUY45
SELL90

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
23-Jan-2015	24-Feb-2015	-3,50%		-3,50%	21	-3,50%
25-Feb-2015	25-Mar-2015	2,70%		2,70%	20	-0,80%
02-Apr-2015	01-May-2015	6,40%		6,40%	20	5,60%
02-May-2015	02-Jun-2015	4,40%		4,40%	20	10,00%
16-Jun-2015	15-Jul-2015	6,10%		6,10%	20	16,10%
28-Jul-2015	17-Oct-2015	-20,80%		-20,80%	58	-4,70%
22-Oct-2015	19-Nov-2015	14,90%		14,90%	20	10,20%
21-Nov-2015	24-Dec-2015	-7,60%		-7,60%	22	2,60%
12-Jan-2016	24-Feb-2016	-2,80%		-2,80%	29	-0,20%
25-Feb-2016	24-Mar-2016	2,00%		2,00%	20	1,80%
25-Mar-2016	23-Apr-2016	7,00%		7,00%	20	8,80%
19-May-2016	30-Jun-2016	1,00%		1,00%	29	9,80%
19-Aug-2016	23-Sep-2016	-3,50%		-3,50%	24	6,30%
28-Sep-2016	27-Oct-2016	-2,10%		-2,10%	21	4,20%
28-Oct-2016	26-Nov-2016	-0,20%		-0,20%	20	4,00%
02-Dec-2016	31-Dec-2016	3,00%		3,00%	20	7,00%
13-Jan-2017	11-Feb-2017	-1,30%		-1,30%	20	5,70%
31-Mar-2017	03-May-2017	-2,20%		-2,20%	22	3,50%
18-May-2017	16-Jun-2017	4,30%		4,30%	20	7,80%
08-Jul-2017	19-Aug-2017	-7,00%		-7,00%	30	0,80%
28-Oct-2017	07-Dec-2017	0,80%		0,80%	27	1,60%
08-Dec-2017	09-Jan-2018	4,90%		4,90%	20	6,50%
10-Jan-2018	08-Feb-2018	8,00%		8,00%	20	14,50%
16-Feb-2018	18-Apr-2018	-18,10%		-18,10%	41	-3,60%
19-Apr-2018	17-May-2018	15,40%		15,40%	20	11,80%
02-Jun-2018	14-Jul-2018	-3,80%		-3,80%	29	8,00%
21-Jul-2018	18-Aug-2018	12,50%		12,50%	20	20,50%
01-Sep-2018	02-Oct-2018	-1,80%		-1,80%	20	18,70%
04-Oct-2018	10-Nov-2018	-7,30%		-7,30%	27	11,40%
08-Dec-2018	09-Jan-2019	-0,30%		-0,30%	20	11,10%
17-Jan-2019	15-Feb-2019	-6,20%		-6,20%	20	4,90%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +4.9
PROFIT/YEAR (%): +1.2
COMPOUND PROFIT (%): -4.8
PASSIVE PROFIT (%): +26.4
NUMBER OF OPERATIONS: 31
NUMBER OF OPERATIONS/YEAR: 7.6
% OF POSITIVE OPERATIONS: 48.4
% OF NEGATIVE OPERATIONS: 51.6
MAXIMUM PROFIT (%): +20.6
MINIMUM PROFIT (%): -4.7

MAXIMUM PROFIT STREAK (%): +25.4
MINIMUM PROFIT STREAK (%): -20.8
AVERAGE PROFIT/OPERATION (%): +0.2
MAXIMUM PROFIT/OPERATION (%): +15.4
MINIMUM PROFIT/OPERATION (%): -20.8
AVERAGE OPERATION DURATION (days): 23.9
MAXIMUM OPERATION DURATION (days): 58
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 72.1

Volatility 6,23%

50.50

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
23-Jan-2015	23-Apr-2015	5,50%		5,50%	62	5,50%
02-May-2015	12-Nov-2015	-1,40%		-1,40%	135	4,10%
21-Nov-2015	13-Jun-2017	8,70%	7,89%	16,59%	390	20,69%
07-Jul-2017	08-Sep-2017	0,60%	3,59%	4,19%	44	24,88%
26-Oct-2017	23-May-2018	15,40%		15,40%	143	40,28%
31-May-2018	30-Jan-2019	-23,40%	13,98%	-9,42%	168	30,86%

BUY55
SELL85

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +5.4
PROFIT/YEAR (%): +1.3
COMPOUND PROFIT (%): +0.5
PASSIVE PROFIT (%): +20.6
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.5
% OF POSITIVE OPERATIONS: 66.7
% OF NEGATIVE OPERATIONS: 33.3
MAXIMUM PROFIT (%): +28.8
MINIMUM PROFIT (%): +4.0

MAXIMUM PROFIT STREAK (%): +24.7
MINIMUM PROFIT STREAK (%): -23.4
AVERAGE PROFIT/OPERATION (%): +0.9
MAXIMUM PROFIT/OPERATION (%): +15.4
MINIMUM PROFIT/OPERATION (%): -23.4
AVERAGE OPERATION DURATION (days): 157.0
MAXIMUM OPERATION DURATION (days): 390
MINIMUM OPERATION DURATION (days): 44
ACTIVE OPERATION TIME (%): 93.0

Volatility 14,21%

The following figure represents the strategies for strategies 10. 60 and 10. 50

ABBV

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
27-Aug-2015	17-Oct-2015	-11,50%		-11,10%	36	-11,10%
08-Sep-2018	09-Oct-2018	0,50%		0,50%	21	-10,60%

INITIAL DATE: 22-Jan-2015
FINAL DATE: 30-Jan-2019
NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -10.6
PROFIT/YEAR (%): -2.6
COMPOUND PROFIT (%): -10.6
PASSIVE PROFIT (%): +22.0
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): -10.6
MINIMUM PROFIT (%): -11.1

MAXIMUM PROFIT STREAK (%): +0.5
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): -5.3
MAXIMUM PROFIT/OPERATION (%): +0.5
MINIMUM PROFIT/OPERATION (%): -11.1
AVERAGE OPERATION DURATION (days): 28.5
MAXIMUM OPERATION DURATION (days): 36
MINIMUM OPERATION DURATION (days): 21
ACTIVE OPERATION TIME (%): 5.6

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
03/02/2015	12/03/2015	-2,70%		-2,70%	26	-2,70%
21/05/2015	09/06/2015	0,30%		0,30%	12	-2,40%
19/06/2015	25/06/2015	4,50%		4,50%	4	2,10%
26/06/2015	16/07/2015	1,60%		1,60%	13	3,70%
11/08/2015	30/10/2015	-23,60%		-23,60%	57	-19,90%
12/12/2015	27/01/2016	5,60%		5,60%	29	-14,30%
30/01/2016	05/03/2016	3,70%		3,70%	24	-10,60%
25/05/2016	28/05/2016	2,30%		2,30%	3	-8,30%
11/06/2016	14/07/2016	9,20%		9,20%	22	0,90%
25/08/2016	17/11/2016	-1,60%	3,74%	2,14%	59	3,04%
21/01/2017	01/03/2017	1%	4,15%	5,15%	26	8,19%
13/04/2017	16/06/2017	3,90%	3,59%	7,49%	44	15,68%
22/07/2017	06/09/2017	-1,60%	3,32%	1,72%	31	17,40%
01/11/2017	30/01/2018	24,80%		24,80%	60	42,20%
07/03/2018	04/05/2018	-11,50%		-11,50%	41	30,70%
19/06/2018	11/08/2018	-3,90%	4,03%	0,13%	38	30,83%
15/09/2018	22/11/2018	-6,60%	4,63%	-1,97%	48	28,86%
08/01/2019	23/01/2019	-1,30%		-1,30%	110	27,56%
30/01/2019	27/02/2019	3,90%	5,32%	9,22%	20	36,78%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +7.8
PROFIT/YEAR (%): +1.9
COMPOUND PROFIT (%): -0.2
PASSIVE PROFIT (%): +29.3
NUMBER OF OPERATIONS: 19
NUMBER OF OPERATIONS/YEAR: 4.7
% OF POSITIVE OPERATIONS: 57.9
% OF NEGATIVE OPERATIONS: 42.1
MAXIMUM PROFIT (%): +27.4
MINIMUM PROFIT (%): -20.0

MAXIMUM PROFIT STREAK (%): +47.3
MINIMUM PROFIT STREAK (%): -23.6
AVERAGE PROFIT/OPERATION (%): +0.4
MAXIMUM PROFIT/OPERATION (%): +24.8
MINIMUM PROFIT/OPERATION (%): -23.6
AVERAGE OPERATION DURATION (days): 29.8
MAXIMUM OPERATION DURATION (days): 60
MINIMUM OPERATION DURATION (days): 3
ACTIVE OPERATION TIME (%): 55.3

Volatility 18,01%

Average	(X-average)^2	Variance	Standard deviation
0,09986316	0,016094261	0,03243625	0,18010066
	0,015342082		
	0,006219398		
	0,003951777		
	0,089319187		
	0,058982513		
	0,04237964		
	0,033438935		
	0,008256113		
	0,00482513		
	0,000322675		
	0,003241804		
	0,005496271		
	0,103772145		
	0,042905671		
	0,043445917		
	0,035621596		
	0,030883438		
	0,071790151		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
21/02/2015	16/04/2015	9,90%		9,90%	37	9,90%
09/06/2015	14/11/2015	-8,80%		-8,80%	112	1,10%
31/12/2015	06/04/2016	-6,30%		-6,30%	65	-5,20%
14/06/2016	10/08/2016	10,50%		10,50%	40	5,30%
25/08/2016	22/12/2016	0,40%	3,74%	4,14%	83	9,44%
20/01/2017	30/03/2017	5,30%	4,15%	9,45%	48	18,89%
12/04/2017	19/09/2017	19,50%	3,59%	23,09%	110	41,98%
18/11/2017	06/03/2018	14,70%		14,70%	71	56,68%
08/03/2018	30/05/2018	-5,20%		-5,20%	57	51,48%
28/06/2018	27/12/2018	-7,60%	8,66%	1,06%	125	52,54%
10/01/2019	27/02/2019	-11,20%	5,32%	-5,88%	33	46,66%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +21.1
PROFIT/YEAR (%): +5.3
COMPOUND PROFIT (%): +16.9
PASSIVE PROFIT (%): +33.7
NUMBER OF OPERATIONS: 11
NUMBER OF OPERATIONS/YEAR: 2.7
% OF POSITIVE OPERATIONS: 54.5
% OF NEGATIVE OPERATIONS: 45.5
MAXIMUM PROFIT (%): +45.1
MINIMUM PROFIT (%): -5.2

MAXIMUM PROFIT STREAK (%): +50.3
MINIMUM PROFIT STREAK (%): -23.9
AVERAGE PROFIT/OPERATION (%): +1.9
MAXIMUM PROFIT/OPERATION (%): +19.5
MINIMUM PROFIT/OPERATION (%): -11.2
AVERAGE OPERATION DURATION (days): 71.0
MAXIMUM OPERATION DURATION (days): 125
MINIMUM OPERATION DURATION (days): 33
ACTIVE OPERATION TIME (%): 77.2

Volatility 22,53%

Average	(X-average)^2	Variance	Standard deviation
0,26251818	0,026738196	0,05074817	0,225273542
	0,063261396		
	0,098921687		
	0,043897869		
	0,028263723		
	0,005419637		
	0,02473757		
	0,092587425		
	0,063646116		
	0,06910685		
	0,041649389		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
30/07/2015	07/08/2015	-1,80%		-1,80%	6	-1,80%
26/09/2015	12/05/2016	6,90%	3,74%	10,64%	157	8,84%
07/02/2017	03/06/2017	4,80%	4,15%	8,95%	81	17,79%
02/08/2017	12/09/2017	18,10%	3,59%	21,69%	28	39,48%
02/05/2018	27/02/2019	-18%	13,98%	-4,02%	207	35,46%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): +9.9
PROFIT/YEAR (%): +2.8
COMPOUND PROFIT (%): +6.5
PASSIVE PROFIT (%): +7.9
NUMBER OF OPERATIONS: 5
NUMBER OF OPERATIONS/YEAR: 1.4
% OF POSITIVE OPERATIONS: 60.0
% OF NEGATIVE OPERATIONS: 40.0
MAXIMUM PROFIT (%): +28.0
MINIMUM PROFIT (%): -1.8

MAXIMUM PROFIT STREAK (%): +29.7
MINIMUM PROFIT STREAK (%): -18.0
AVERAGE PROFIT/OPERATION (%): +2.0
MAXIMUM PROFIT/OPERATION (%): +18.1
MINIMUM PROFIT/OPERATION (%): -18.0
AVERAGE OPERATION DURATION (days): 95.8
MAXIMUM OPERATION DURATION (days): 207
MINIMUM OPERATION DURATION (days): 6
ACTIVE OPERATION TIME (%): 53.1

Volatility 15,64%

22,53	(X-average)^2	Variance	Standard deviation
0,19954	0,047323652	0,02446282	0,156405954
	0,0123521		
	0,00046829		
	0,038126468		
	0,024043604		

Enagas

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	12/02/2015	30/03/2015	1,20%		1,20%	32	1,20%
BUY30	06/05/2015	22/07/2015	-4,10%	5,10%	1,00%	55	2,20%
SELL70	25/08/2015	12/10/2015	11,20%		11,20%	34	13,40%
	15/12/2015	04/02/2016	-2,40%		-2,40%	35	11,00%
	18/02/2016	24/03/2016	4,40%		4,40%	25	15,40%
	09/05/2016	14/07/2016	0,90%	5,71%	6,61%	48	22,01%
	22/07/2016	20/12/2016	-12%		-12,00%	107	10,01%
	25/01/2017	03/04/2017	4,90%		4,90%	48	14,91%
	30/06/2017	05/12/2017	-1,90%	5,88%	3,98%	112	18,89%
	28/12/2017	28/02/2018	-11,80%		-11,80%	43	7,09%
	29/05/2018	28/06/2018	7,30%		7,30%	22	14,39%
	26/07/2018	01/11/2108	-2,10%		-2,10%	70	12,29%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -4.4
PROFIT/YEAR (%): -1.1
COMPOUND PROFIT (%): -6.9
PASSIVE PROFIT (%): -7.7
NUMBER OF OPERATIONS: 12
NUMBER OF OPERATIONS/YEAR: 2.9
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +11.2

MAXIMUM PROFIT STREAK (%): +14.1
MINIMUM PROFIT STREAK (%): -20.8
AVERAGE PROFIT/OPERATION (%): -0.4
MAXIMUM PROFIT/OPERATION (%): +11.2
MINIMUM PROFIT/OPERATION (%): -12.0
AVERAGE OPERATION DURATION (days): 52.6
MAXIMUM OPERATION DURATION (days): 112
MINIMUM OPERATION DURATION (days): 22
ACTIVE OPERATION TIME (%): 60.5
MINIMUM PROFIT (%): -9.6

Average	(X-average)^2	Variance	Standard deviation
	0,000104892	0,004634867	0,068079855
0,010241667	3,09174E-06		
	5,84028E-08		
	0,010354758		
	0,001172492		
	0,001139625		
	0,003120153		
	0,016962892		
	0,001502208		
	0,000873695		
	0,016445925		
	0,003938608		

Volatility 6,81%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	12/02/2015	27/07/2015	-4,30%	5,10%	0,80%	114	0,80%
BUY35	24/08/2015	13/10/2015	8,50%		8,50%	36	9,30%
SELL80	15/12/2015	21/04/2016	-1%		-1,00%	88	8,30%
	04/05/2016	06/04/2017	-10,10%		-10,10%	240	-1,80%
	29/06/2017	07/12/2017	-4%	5,88%	1,88%	115	0,08%
	22/12/2017	11/04/2018	-5,80%		-5,80%	73	-5,72%
	28/05/2018	01/11/2018	-0,70%	6,13%	5,43%	113	-0,29%
	08/01/2019	15/02/2019	0,60%		0,60%	29	0,31%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -16.7
PROFIT/YEAR (%): -4.1
COMPOUND PROFIT (%): -16.5
PASSIVE PROFIT (%): -7.7
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 25.0
% OF NEGATIVE OPERATIONS: 75.0
MAXIMUM PROFIT (%): +4.3

MAXIMUM PROFIT STREAK (%): +8.5
MINIMUM PROFIT STREAK (%): -21.6
AVERAGE PROFIT/OPERATION (%): -2.1
MAXIMUM PROFIT/OPERATION (%): +8.5
MINIMUM PROFIT/OPERATION (%): -10.1
AVERAGE OPERATION DURATION (days): 101.0
MAXIMUM OPERATION DURATION (days): 240
MINIMUM OPERATION DURATION (days): 29
ACTIVE OPERATION TIME (%): 77.5
MINIMUM PROFIT (%): -17.3

Average	(X-average)^2	Variance	Standard deviation
0,0003875	5,79502E-05	0,003036341	0,055103004
	0,007159275		
	0,0001079		
	0,010279425		
	0,00033902		
	0,0034091		
	0,002906558		
	3,15002E-05		

Volatility 5,51%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	10/06/2015	17/07/2015	2,10%	5,10%	7,20%	27	7,20%
BUY20	25/08/2015	22/09/2015	6,20%		6,20%	20	13,40%
SELL65	11/11/2016	14/12/2016	2,20%		2,20%	23	15,60%
	01/02/2017	28/03/2017	5,70%		5,70%	39	21,30%
	06/07/2017	09/08/2017	2,40%		2,40%	24	23,70%
	29/12/2017	28/02/2018	-11,20%		-11,20%	42	12,50%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +7.3
PROFIT/YEAR (%): +1.8
COMPOUND PROFIT (%): +6.4
PASSIVE PROFIT (%): -2.2
NUMBER OF OPERATIONS: 6
NUMBER OF OPERATIONS/YEAR: 1.5
% OF POSITIVE OPERATIONS: 83.3
% OF NEGATIVE OPERATIONS: 16.7
MAXIMUM PROFIT (%): +18.5

MAXIMUM PROFIT STREAK (%): +16.4
MINIMUM PROFIT STREAK (%): -11.2
AVERAGE PROFIT/OPERATION (%): +1.2
MAXIMUM PROFIT/OPERATION (%): +6.2
MINIMUM PROFIT/OPERATION (%): -11.2
AVERAGE OPERATION DURATION (days): 29.2
MAXIMUM OPERATION DURATION (days): 42
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 16.8
MINIMUM PROFIT (%): +2.1

Average	(X-average)^2	Variance	Standard deviat
0,020833333	0,002618028	0,003879472	0,062285
	0,001694694		
	1,36111E-06		
	0,001308028		
	1,00278E-05		
	0,017644694		

Volatility 6,23%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	17/11/2016	15/12/2016	4,70%		4,70%	20	4,70%
BUY10	02/02/2017	06/03/2017	4,10%		4,10%	22	8,80%
SELL60	07/07/2017	07/08/2017	3,10%		3,10%	21	11,90%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +11.9
PROFIT/YEAR (%): +2.9
COMPOUND PROFIT (%): +12.4
PASSIVE PROFIT (%): +7.0
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +11.9

MAXIMUM PROFIT STREAK (%): +7.2
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +4.0
MAXIMUM PROFIT/OPERATION (%): +4.7
MINIMUM PROFIT/OPERATION (%): +3.1
AVERAGE OPERATION DURATION (days): 21.0
MAXIMUM OPERATION DURATION (days): 22
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 6.0
MINIMUM PROFIT (%): +4.7

Average	(X-average)^2	Variance	Standard deviation
0,039666667	5,37778E-05	4,35556E-05	0,006599663
	1,77778E-06		
	7,51111E-05		

Volatility 0,66%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
11-Feb-2015	19-Oct-2015 1	-0,30%	5,10%	4,80%	175	4,80%
11-Nov-2015	31-Jan-2019 8	-7,20%	18,77%	11,57%	825	16,37%

BUY45
SELL90

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -7.5
PROFIT/YEAR (%): -1.9
COMPOUND PROFIT (%): -7.5
PASSIVE PROFIT (%): -5.4
NUMBER OF OPERATIONS: 2
NUMBER OF OPERATIONS/YEAR: 0.5
% OF POSITIVE OPERATIONS: 0.0
% OF NEGATIVE OPERATIONS: 100.0
MAXIMUM PROFIT (%): -0.3
MINIMUM PROFIT (%): -7.5

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -7.2
AVERAGE PROFIT/OPERATION (%): -3.7
MAXIMUM PROFIT/OPERATION (%): -0.3
MINIMUM PROFIT/OPERATION (%): -7.2
AVERAGE OPERATION DURATION (days): 500.0
MAXIMUM OPERATION DURATION (days): 825
MINIMUM OPERATION DURATION (days): 175
ACTIVE OPERATION TIME (%): 96.9
COST OF BUY-SELL OPERATION (%): 1.0
Volatility 8,18%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
17-Nov-2016	15-Dec-2016	4,70%		4,70%	20	4,70%
02-Feb-2017	03-Mar-2017	3,00%		3,00%	21	7,70%
07-Jul-2017	04-Aug-2017	2,20%		2,20%	20	9,90%

BUY 10
SELL50

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +9.9
PROFIT/YEAR (%): +2.5
COMPOUND PROFIT (%): +10.2
PASSIVE PROFIT (%): +10.0
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 100.0
% OF NEGATIVE OPERATIONS: 0.0
MAXIMUM PROFIT (%): +9.9
MINIMUM PROFIT (%): +4.7

MAXIMUM PROFIT STREAK (%): +5.2
MINIMUM PROFIT STREAK (%): +0.0
AVERAGE PROFIT/OPERATION (%): +3.3
MAXIMUM PROFIT/OPERATION (%): +4.7
MINIMUM PROFIT/OPERATION (%): +2.2
AVERAGE OPERATION DURATION (days): 20.3
MAXIMUM OPERATION DURATION (days): 21
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 5.9
Volatility 2,61%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
10-Feb-2015	23-Mar-2015	1,10%		1,10%	29	1,10%
30-Apr-2015	24-Jun-2015	-6,70%		-6,70%	38	-5,60%
30-Jun-2015	28-Jul-2015 2	2,30%		2,30%	20	-3,30%
05-Aug-2015	10-Sep-2015	-3,40%		-3,40%	26	-6,70%
29-Sep-2015	27-Oct-2015	9,50%		9,50%	20	2,80%
10-Nov-2015	08-Dec-2015	2,20%		2,20%	20	5,00%
09-Dec-2015	12-Jan-2016	-6,80%		-6,80%	22	-1,80%
15-Jan-2016	29-Feb-2016	-0,50%		-0,50%	31	-2,30%
09-Mar-2016	08-Apr-2016	4,10%		4,10%	20	1,80%
26-Apr-2016	24-May-2016	-0,20%		-0,20%	20	1,60%
02-Jun-2016	30-Jun-2016	1,70%		1,70%	20	3,30%
19-Jul-2016	17-Aug-2016	-0,40%		-0,40%	21	2,90%
18-Aug-2016	30-Sep-2016	-3,20%		-3,20%	31	-0,30%
07-Oct-2016	02-Dec-2016	-13,20%		-13,20%	40	-13,50%
02-Jan-2017	13-Feb-2017	-4,50%		-4,50%	30	-18,00%
28-Feb-2017	28-Mar-2017	3,30%		3,30%	20	-14,70%
24-Apr-2017	23-May-2017	3,40%		3,40%	20	-11,30%
16-Jun-2017	26-Jul-2017 2	-9,50%		-9,50%	28	-20,80%
01-Aug-2017	30-Aug-2017	2,10%		2,10%	21	-18,70%
01-Sep-2017	12-Oct-2017	-3,10%		-3,10%	29	-21,80%
16-Nov-2017	14-Dec-2017	3,20%		3,20%	20	-18,60%
20-Dec-2017	26-Feb-2018	-11,70%		-11,70%	45	-30,30%
16-Mar-2018	17-Apr-2018	5,10%		5,10%	20	-25,20%
23-May-2018	20-Jun-2018	1,00%		1,00%	20	-24,20%
04-Jul-2018	07-Aug-2018	-1,70%		-1,70%	24	-25,90%
16-Aug-2018	13-Sep-2018	0,50%		0,50%	20	-25,40%
17-Sep-2018	31-Oct-2018	-3,30%		-3,30%	32	-28,70%
29-Nov-2018	10-Jan-2019	0,40%		0,40%	27	-28,30%
18-Feb-2019	19-Feb-2019	-1,30%		-1,30%	2	-29,60%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -29.6
PROFIT/YEAR (%): -7.3
COMPOUND PROFIT (%): -28.5
PASSIVE PROFIT (%): -8.2
NUMBER OF OPERATIONS: 29
NUMBER OF OPERATIONS/YEAR: 7.1
% OF POSITIVE OPERATIONS: 48.3
% OF NEGATIVE OPERATIONS: 51.7
MAXIMUM PROFIT (%): +5.1
MINIMUM PROFIT (%): -30.4

MAXIMUM PROFIT STREAK (%): +11.8
MINIMUM PROFIT STREAK (%): -35.4
AVERAGE PROFIT/OPERATION (%): -1.0
MAXIMUM PROFIT/OPERATION (%): +9.5
MINIMUM PROFIT/OPERATION (%): -13.2
AVERAGE OPERATION DURATION (days): 24.7
MAXIMUM OPERATION DURATION (days): 45
MINIMUM OPERATION DURATION (days): 2
ACTIVE OPERATION TIME (%): 68.5
Volatility 12,22%

50.50

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
10-Feb-2015	19-Oct-2015	-0,20%		-0,20%	176	-0,20%
10-Nov-2015	08-Dec-2017	-7,60%	5,78%	-1,82%	535	-2,02%
20-Dec-2017	07-May-2018	-0,90%	6,86%	5,96%	92	3,94%
17-May-2018	31-Jan-2019	5,00%	12,01%	17,01%	183	20,95%

BUY55
SELL85

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -3.8
PROFIT/YEAR (%): -0.9
COMPOUND PROFIT (%): -4.2
PASSIVE PROFIT (%): -5.3
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.0
% OF POSITIVE OPERATIONS: 25.0
% OF NEGATIVE OPERATIONS: 75.0
MAXIMUM PROFIT (%): -0.2
MINIMUM PROFIT (%): -8.8

MAXIMUM PROFIT STREAK (%): +5.0
MINIMUM PROFIT STREAK (%): -8.5
AVERAGE PROFIT/OPERATION (%): -1.0
MAXIMUM PROFIT/OPERATION (%): +5.0
MINIMUM PROFIT/OPERATION (%): -7.6
AVERAGE OPERATION DURATION (days): 246.5
MAXIMUM OPERATION DURATION (days): 535
MINIMUM OPERATION DURATION (days): 92
ACTIVE OPERATION TIME (%): 95.5
Volatility 10,49%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
12-Feb-2015	27-Feb-2015	1,90%		1,90%	11	1,90%
13-Mar-2015	26-Mar-2015	1,80%		1,80%	9	3,70%
04-May-2015	22-Jul-2015	-7,20%		-7,20%	57	-3,50%
24-Aug-2015	11-Sep-2015	4,10%		4,10%	14	0,60%
11-Nov-2015	27-Nov-2015	3,10%		3,10%	12	3,70%
15-Dec-2015	03-Feb-2016	-2,80%		-2,80%	34	0,90%
18-Feb-2016	02-Mar-2016	3,40%		3,40%	9	4,30%
02-May-2016	16-May-2016	0,00%		0,00%	10	4,30%
17-Jun-2016	14-Jul-2016	3,70%		3,70%	19	8,00%
19-Jul-2016	01-Aug-2016	0,20%		0,20%	9	8,20%
11-Aug-2016	08-Sep-2016	-0,80%		-0,80%	20	7,40%
22-Sep-2016	27-Oct-2016	-0,40%		-0,40%	25	7,00%
03-Nov-2016	14-Dec-2016	-4,40%		-4,40%	29	2,60%
06-Jan-2017	14-Feb-2017	-3,10%	5,78%	2,68%	27	5,28%
28-Jun-2017	07-Aug-2017	-6,70%		-6,70%	28	-1,42%
05-Sep-2017	24-Oct-2017	-3,40%		-3,40%	35	-4,82%
17-Nov-2017	05-Dec-2017	2,20%		2,20%	12	-2,62%
22-Dec-2017	28-Feb-2018	-10,90%		-10,90%	45	-13,52%
28-May-2018	15-Jun-2018	4,70%		4,70%	14	-8,82%
17-Jul-2018	08-Aug-2018.	-2,20%		-2,20%	16	-11,02%
25-Sep-2018	01-Nov-2018	-2,80%		-2,80%	27	-13,82%
29-Nov-2018	13-Dec-2018	3,80%		3,80%	10	-10,02%
18-Feb-2019	18-Feb-2019	-0,60%		-0,60%	1	-10,62%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -16.5
PROFIT/YEAR (%): -4.0
COMPOUND PROFIT (%): -16.8
PASSIVE PROFIT (%): -7.4
NUMBER OF OPERATIONS: 23
NUMBER OF OPERATIONS/YEAR: 5.6
% OF POSITIVE OPERATIONS: 47.8
% OF NEGATIVE OPERATIONS: 52.2
MAXIMUM PROFIT (%): +8.1
MINIMUM PROFIT (%): -19.7

MAXIMUM PROFIT STREAK (%): +11.7
MINIMUM PROFIT STREAK (%): -27.8
AVERAGE PROFIT/OPERATION (%): -0.7
MAXIMUM PROFIT/OPERATION (%): +4.7
MINIMUM PROFIT/OPERATION (%): -10.9
AVERAGE OPERATION DURATION (days): 20.6
MAXIMUM OPERATION DURATION (days): 57
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 45.3

Volatility 7,22%

BUY25
SELL80

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
02-Feb-2015	26-Feb-2015	-3,70%		-3,70%	18	-3,70%
09-Apr-2015	11-May-2015	-3,10%	5,10%	2,00%	21	-1,70%
16-Jul-2015	27-Aug-2015	-5,50%		-5,50%	30	-7,20%
23-Sep-2015	24-Nov-2015	11,20%		11,20%	44	4,00%
03-Feb-2016	01-Mar-2016	-5,00%		-5,00%	19	-1,00%
14-Mar-2016	10-May-2016	1,70%		1,70%	39	0,70%
31-May-2016	02-Jun-2016	-3,40%		-3,40%	2	-2,70%
09-Jun-2016	15-Jun-2016	-6,50%		-6,50%	4	-9,20%
06-Jul-2016	07-Jul-2016	-1,20%		-1,20%	1	-10,40%
14-Jul-2016	09-Aug-2016	-2,30%		-2,30%	18	-12,70%
15-Dec-2016	26-Jan-2017	-5,70%	5,78%	0,08%	29	-12,62%
27-Feb-2017	27-Jun-2017	12,80%		12,80%	83	0,18%
10-Aug-2017	19-Sep-2017	-3,10%		-3,10%	28	-2,92%
23-Oct-2017	28-Nov-2017	-1,50%		-1,50%	26	-4,42%
05-Dec-2017	04-Jan-2018	-4,40%	6,86%	2,46%	19	-1,96%
09-Mar-2018	30-May-2018	4,50%		4,50%	55	2,54%
28-Jun-2018	16-Jul-2018	-3,90%	6,13%	2,23%	12	4,77%
31-Aug-2018	20-Sep-2018	-2,60%		-2,60%	14	2,17%
09-Nov-2018	28-Dec-2018	-4,00%		-4,00%	33	-1,83%
28-Jan-2019	20-Feb-2019	-1,40%		-1,40%	17	-3,23%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -26.9
PROFIT/YEAR (%): -6.6
COMPOUND PROFIT (%): -25.7
PASSIVE PROFIT (%): -12.8
NUMBER OF OPERATIONS: 20
NUMBER OF OPERATIONS/YEAR: 4.9
% OF POSITIVE OPERATIONS: 20.0
% OF NEGATIVE OPERATIONS: 80.0
MAXIMUM PROFIT (%): -1.1
MINIMUM PROFIT (%): -26.9

MAXIMUM PROFIT STREAK (%): +11.2
MINIMUM PROFIT STREAK (%): -25.9
AVERAGE PROFIT/OPERATION (%): -1.3
MAXIMUM PROFIT/OPERATION (%): +12.8
MINIMUM PROFIT/OPERATION (%): -6.5
AVERAGE OPERATION DURATION (days): 25.6
MAXIMUM OPERATION DURATION (days): 83
MINIMUM OPERATION DURATION (days): 1
ACTIVE OPERATION TIME (%): 49.0

Volatility 4,99%

Average	(X-average)^2	Variance	Standard deviation
-3,06%	4,08321E-05	0,002494	0,049939562
	0,000185232		
	0,001713132		
	0,004985772		
	0,000424772		
	0,001414512		
	1,30321E-05		
	0,003768732		
	0,005386092		
	0,009291032		
	0,009137448		
	0,001050408		
	1,9881E-06		
	0,000184688		
	0,00012122		
	0,00313712		
	0,006132456		
	0,002736336		
	0,000151536		
	2,8561E-06		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
20-Aug-2015	28-Aug-2015	-5,70%		-5,70%	6	-5,70%
16-Oct-2015	09-Dec-2015	1,80%		1,80%	38	-3,90%
18-Apr-2016	02-May-2016	-1,80%		-1,80%	10	-5,70%
19-Jan-2017	26-Jan-2017	-4,90%		-4,90%	5	-10,60%
29-Mar-2017	27-Jun-2017	8,70%		8,70%	61	-1,90%
10-Apr-2018	15-Jun-2018	6,40%		6,40%	47	4,50%
12-Dec-2018	28-Dec-2018	-7,20%		-7,20%	10	-2,70%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -2.6
PROFIT/YEAR (%): -0.7
COMPOUND PROFIT (%): -3.7
PASSIVE PROFIT (%): -4.7
NUMBER OF OPERATIONS: 7
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 42.9
% OF NEGATIVE OPERATIONS: 57.1
MAXIMUM PROFIT (%): +4.6
MINIMUM PROFIT (%): -10.5

MAXIMUM PROFIT STREAK (%): +15.1
MINIMUM PROFIT STREAK (%): -7.2
AVERAGE PROFIT/OPERATION (%): -0.4
MAXIMUM PROFIT/OPERATION (%): +8.7
MINIMUM PROFIT/OPERATION (%): -7.2
AVERAGE OPERATION DURATION (days): 25.3
MAXIMUM OPERATION DURATION (days): 61
MINIMUM OPERATION DURATION (days): 5
ACTIVE OPERATION TIME (%): 17.2

Volatility 5,65%

Average	(X-average)^2	Variance	Standard deviation
-3,71%	0,003249	0,003196	0,056530649
	0,001521		
	0,003249		
	0,011236		
	0,000361		
	0,002025		
	0,000729		

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
28-Jan-2016	16-Feb-2016	-2,20%		-2,20%	13	-2,20%
24-Mar-2016	13-May-2016	-0,70%		-0,70%	34	-2,90%
13-Jun-2017	14-Nov-2017	-9,00%		-9,00%	110	-11,90%
21-Aug-2018	08-Jan-2019	0,60%	5,88%	6,48%	97	-5,42%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): -11.4
PROFIT/YEAR (%): -3.2
COMPOUND PROFIT (%): -11.1
PASSIVE PROFIT (%): -6.8
NUMBER OF OPERATIONS: 4
NUMBER OF OPERATIONS/YEAR: 1.1
% OF POSITIVE OPERATIONS: 25.0
% OF NEGATIVE OPERATIONS: 75.0
MAXIMUM PROFIT (%): -2.2
MINIMUM PROFIT (%): -11.9

MAXIMUM PROFIT STREAK (%): +0.6
MINIMUM PROFIT STREAK (%): -9.7
AVERAGE PROFIT/OPERATION (%): -2.8
MAXIMUM PROFIT/OPERATION (%): +0.6
MINIMUM PROFIT/OPERATION (%): -9.0
AVERAGE OPERATION DURATION (days): 63.5
MAXIMUM OPERATION DURATION (days): 110
MINIMUM OPERATION DURATION (days): 13
ACTIVE OPERATION TIME (%): 27.6

Volatility 3,83%

Average	(X-average)^2	Variance	Standard deviation
-5,61%	0,001159403	0,001464	0,038266271
	0,000731703		
	0,003962703		
	3,4225E-06		

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	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operatior	Cumulative Prfm.
RSI14	24/04/2015	25/05/2015	0,60%		0,60%	20	0,60%
BUY30	10/06/2015	11/08/2015	-6,80%		-6,80%	44	-6,20%
SELL70	24/08/2015	05/10/2015	10,90%		10,90%	30	4,70%
	22/12/2015	26/02/2016	-7,60%	2,45%	-5,15%	46	-0,45%
	11/04/2016	15/07/2016	-5,60%	2,73%	-2,87%	69	-3,32%
	31/08/2016	13/12/2016	-9,70%	3,01%	-6,69%	74	-10,01%
	20/01/2017	22/03/2017	0,50%		0,50%	43	-9,51%
	19/04/2017	26/06/2017	12,80%		12,80%	47	3,29%
	10/07/2017	06/09/2017	1,70%		1,70%	42	4,99%
	20/10/2017	29/11/2017	6,50%		6,50%	28	11,49%
	28/12/2017	24/04/2018	-7,20%	5,80%	-1,40%	80	10,09%
	28/05/2018	14/01/2019	-22,40%	7,33%	-15,07%	162	-4,98%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -26.2
PROFIT/YEAR (%): -6.4
COMPOUND PROFIT (%): -27.5
PASSIVE PROFIT (%): -37.5
NUMBER OF OPERATIONS: 12
NUMBER OF OPERATIONS/YEAR: 2.9
% OF POSITIVE OPERATIONS: 50.0
% OF NEGATIVE OPERATIONS: 50.0
MAXIMUM PROFIT (%): +4.7

MAXIMUM PROFIT STREAK (%): +10.9
MINIMUM PROFIT STREAK (%): -30.9
AVERAGE PROFIT/OPERATION (%): -2.2
MAXIMUM PROFIT/OPERATION (%): +12.8
MINIMUM PROFIT/OPERATION (%): -22.4
AVERAGE OPERATION DURATION (days): 57.1
MAXIMUM OPERATION DURATION (days): 162
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 65.7
MINIMUM PROFIT (%): -26.2

Average	(X-average)^2	Variance	Standard deviation
-0,00415	0,00010302	0,00567628	0,075341097
	0,00407682		
	0,01280292		
	0,00224202		
	0,0006027		
	0,00393756		
	8,3723E-05		
	0,01746362		
	0,00044732		
	0,00478172		
	9,7022E-05		
	0,0214769		

Volatility 7,53%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	05/03/2015	02/04/2015	12,90%		12,90%	20	12,90%
BUY35	24/04/2015	08/10/2015	-10,80%		-10,80%	118	2,10%
SELL80	13/11/2015	29/02/2016	-9,80%	2,45%	-7,35%	74	-5,25%
	08/04/2016	26/07/2016	-3%	2,73%	-0,27%	77	-5,52%
	30/08/2016	16/12/2016	-7,60%	3,01%	-4,59%	78	-10,11%
	20/01/2017	23/03/2017	2,20%		2,20%	44	-7,91%
	19/04/2017	08/09/2017	10,90%		10,90%	101	2,99%
	11/10/2017	23/01/2019	-27%	13,25%	-13,75%	326	-10,76%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -32.1
PROFIT/YEAR (%): -7.9
COMPOUND PROFIT (%): -32.5
PASSIVE PROFIT (%): -30.6
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 37.5
% OF NEGATIVE OPERATIONS: 62.5
MAXIMUM PROFIT (%): +12.9

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -45.0
AVERAGE PROFIT/OPERATION (%): -4.0
MAXIMUM PROFIT/OPERATION (%): +12.9
MINIMUM PROFIT/OPERATION (%): -27.0
AVERAGE OPERATION DURATION (days): 104.8
MAXIMUM OPERATION DURATION (days): 326
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 80.3
MINIMUM PROFIT (%): -32.1

Average	(X-average)^2	Variance	Standard deviation
-0,01345	0,020292	0,00820567	0,090585167
	0,0089397		
	0,003606		
	0,00011556		
	0,001053		
	0,0012567		
	0,014994		
	0,0153884		

Volatility 9,06%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operation	Cumulative Prfm.
RSI14	16/06/2015	27/07/2015	-4,60%		-4,60%	29	-4,60%
BUY20	19/01/2016	26/02/2016	1,60%		1,60%	28	-3,00%
SELL65	09/05/2016	08/06/2016	2,40%		2,40%	22	-0,60%
	16/06/2016	15/07/2016	0,10%		0,10%	21	-0,50%
	17/10/2016	12/12/2016	-2,30%		-2,30%	40	-2,80%
	24/01/2017	21/03/2017	1,80%		1,80%	40	-1,00%
	10/07/2017	06/09/2017	1,70%		1,70%	42	0,70%
	15/02/2018	16/04/2018	-3,20%	2,87%	-0,33%	40	0,37%
	12/10/2018	12/11/2018	-15,30%		-15,30%	21	-14,93%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -17.7
PROFIT/YEAR (%): -4.4
COMPOUND PROFIT (%): -17.6
PASSIVE PROFIT (%): -28.3
NUMBER OF OPERATIONS: 9
NUMBER OF OPERATIONS/YEAR: 2.2
% OF POSITIVE OPERATIONS: 55.6
% OF NEGATIVE OPERATIONS: 44.4
MAXIMUM PROFIT (%): +0.7

MAXIMUM PROFIT STREAK (%): +5.4
MINIMUM PROFIT STREAK (%): -18.5
AVERAGE PROFIT/OPERATION (%): -2.0
MAXIMUM PROFIT/OPERATION (%): +2.4
MINIMUM PROFIT/OPERATION (%): -15.3
AVERAGE OPERATION DURATION (days): 31.4
MAXIMUM OPERATION DURATION (days): 42
MINIMUM OPERATION DURATION (days): 21
ACTIVE OPERATION TIME (%): 27.1
MINIMUM PROFIT (%): -17.7

Average	(X-average)^2	Variance	Standard deviation
-0,0165889	0,00086501	0,00278157	0,052740633
	0,00106204		
	0,00164746		
	0,00030937		
	4,1102E-05		
	0,00119639		
	0,00112821		
	0,00017659		
	0,01860799		

Volatility 5,27%

	Buy dates	Sale dates	Performance	Div.	Prfm. Div.	Days of operatior	Cumulative Prfm.
RSI14	08/07/2015	05/08/2015	11,10%		11,10%	20	11,10%
BUY10	12/03/2018	12/04/2018	0,70%	2,87%	3,57%	21	14,67%
SELL60	15/10/2018	12/11/2018	-8,40%		-8,40%	20	6,27%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +3.3
PROFIT/YEAR (%): +0.8
COMPOUND PROFIT (%): +2.4
PASSIVE PROFIT (%): -20.4
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 66.7
% OF NEGATIVE OPERATIONS: 33.3
MAXIMUM PROFIT (%): +11.8

MAXIMUM PROFIT STREAK (%): +0.7
MINIMUM PROFIT STREAK (%): -8.4
AVERAGE PROFIT/OPERATION (%): +1.1
MAXIMUM PROFIT/OPERATION (%): +11.1
MINIMUM PROFIT/OPERATION (%): -8.4
AVERAGE OPERATION DURATION (days): 20.3
MAXIMUM OPERATION DURATION (days): 21
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 5.8
MINIMUM PROFIT (%): +3.3

Average	(X-average)^2	Variance	Standard deviation
0,0209	0,00811801	0,00644702	0,080293337
	0,00021904		
	0,01100401		

Volatility 8,03%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
08-Jul-2015	05-Aug-2015	11,10%		11,10%	20	11,10%
12-Mar-2018	11-Apr-2018	-2,20%		-2,20%	20	8,90%
15-Oct-2018	12-Nov-2018	-8,40%		-8,40%	20	0,50%

BUY 10
SELL50

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): +0.4
PROFIT/YEAR (%): +0.1
COMPOUND PROFIT (%): -0.6
PASSIVE PROFIT (%): -23.3
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 33.3
% OF NEGATIVE OPERATIONS: 66.7
MAXIMUM PROFIT (%): +11.1
MINIMUM PROFIT (%): +0.4

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -10.6
AVERAGE PROFIT/OPERATION (%): +0.1
MAXIMUM PROFIT/OPERATION (%): +11.1
MINIMUM PROFIT/OPERATION (%): -8.4
AVERAGE OPERATION DURATION (days): 20.0
MAXIMUM OPERATION DURATION (days): 20
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 5.8

Volatility 5,59%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
04-Mar-2015	08-Apr-2015	15,60%		15,60%	23	15,60%
20-Apr-2015	12-Oct-2015 1	-8,10%		-8,10%	124	7,50%
10-Nov-2015	02-Mar-2016	-12,10%	2,73%	-9,37%	79	-1,87%
16-Mar-2016	26-Jul-2016 !	-9,60%	2,65%	-6,95%	92	-8,82%
17-Aug-2016	19-Dec-2016	-8,60%		-8,60%	88	-17,42%
12-Jan-2017	27-Mar-2017	2,90%		2,90%	52	-14,52%
13-Apr-2017	31-Jan-2019 4	-18,30%	5,21%	-13,09%	459	-27,61%

BUY55
SELL85

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -38.2
PROFIT/YEAR (%): -9.5
COMPOUND PROFIT (%): -35.1
PASSIVE PROFIT (%): -34.2
NUMBER OF OPERATIONS: 7
NUMBER OF OPERATIONS/YEAR: 1.7
% OF POSITIVE OPERATIONS: 28.6
% OF NEGATIVE OPERATIONS: 71.4
MAXIMUM PROFIT (%): +15.6
MINIMUM PROFIT (%): -38.2

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -53.8
AVERAGE PROFIT/OPERATION (%): -5.5
MAXIMUM PROFIT/OPERATION (%): +15.6
MINIMUM PROFIT/OPERATION (%): -18.3
AVERAGE OPERATION DURATION (days): 131.0
MAXIMUM OPERATION DURATION (days): 459
MINIMUM OPERATION DURATION (days): 23
ACTIVE OPERATION TIME (%): 88.9

Volatility 14,94%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
05-Mar-2015	02-Mar-2016	-7,30%	2,22%	-5,08%	254	-5,08%
17-Mar-2016	28-Mar-2017	-10,40%	8,34%	-2,06%	265	-7,14%
18-Apr-2017	31-Jan-2019.	-18,00%	5,21%	-12,79%	458	-19,93%

BUY45
SELL90

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -35.6
PROFIT/YEAR (%): -8.8
COMPOUND PROFIT (%): -31.8
PASSIVE PROFIT (%): -33.1
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.7
% OF POSITIVE OPERATIONS: 0.0
% OF NEGATIVE OPERATIONS: 100.0
MAXIMUM PROFIT (%): -7.3
MINIMUM PROFIT (%): -35.6

MAXIMUM PROFIT STREAK (%): +0.0
MINIMUM PROFIT STREAK (%): -28.4
AVERAGE PROFIT/OPERATION (%): -11.9
MAXIMUM PROFIT/OPERATION (%): -7.3
MINIMUM PROFIT/OPERATION (%): -18.0
AVERAGE OPERATION DURATION (days): 325.7
MAXIMUM OPERATION DURATION (days): 458
MINIMUM OPERATION DURATION (days): 254
ACTIVE OPERATION TIME (%): 94.7

Volatility 8,05%

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
04-Mar-2015	01-Apr-2015	10,90%		10,90%	20	10,90%
21-Apr-2015	20-May-2015	-1,30%		-1,30%	20	9,60%
03-Jun-2015	20-Jul-2015 3	-15,50%		-15,50%	33	-5,90%
20-Aug-2015	01-Oct-2015	-0,80%		-0,80%	30	-6,70%
12-Nov-2015	04-Jan-2016	-5,00%		-5,00%	35	-11,70%
06-Jan-2016	22-Feb-2016	-11,80%		-11,80%	33	-23,50%
16-Mar-2016	27-Apr-2016	-3,60%		-3,60%	28	-27,10%
03-May-2016	31-May-2016	-0,50%		-0,50%	20	-27,60%
13-Jun-2016	14-Jul-2016 2	-4,10%		-4,10%	23	-31,70%
18-Aug-2016	20-Sep-2016	-3,70%		-3,70%	23	-35,40%
21-Sep-2016	23-Nov-2016	-11,90%		-11,90%	45	-47,30%
25-Nov-2016	23-Dec-2016	7,10%		7,10%	20	-40,20%
13-Jan-2017	10-Feb-2017	-4,80%		-4,80%	20	-45,00%
13-Feb-2017	14-Mar-2017	-4,10%		-4,10%	21	-49,10%
15-Mar-2017	12-Apr-2017	9,10%		9,10%	20	-40,00%
13-Apr-2017	16-May-2017	2,20%		2,20%	20	-37,80%
19-May-2017	19-Jun-2017	4,20%		4,20%	21	-33,60%
07-Jul-2017	04-Sep-2017 4	-2,70%		-2,70%	41	-36,30%
09-Oct-2017	06-Nov-2017	1,80%		1,80%	20	-34,50%
16-Nov-2017	05-Jan-2018	3,70%		3,70%	33	-30,80%
11-Jan-2018	27-Feb-2018	-4,50%		-4,50%	33	-35,30%
02-Mar-2018	04-Apr-2018	-4,50%		-4,50%	21	-39,80%
05-Apr-2018	04-May-2018	2,40%		2,40%	20	-37,40%
25-May-2018	22-Jun-2018	-2,80%		-2,80%	20	-40,20%
26-Jun-2018	27-Jul-2018 2	-4,20%		-4,20%	23	-44,40%
30-Jul-2018	31-Aug-2018 :	-3,40%		-3,40%	24	-47,80%
05-Sep-2018	03-Oct-2018	1,10%		1,10%	20	-46,70%
05-Oct-2018	05-Nov-2018	-24,60%		-24,60%	21	-71,30%
06-Nov-2018	04-Dec-2018	1,30%		1,30%	20	-70,00%
17-Dec-2018	17-Jan-2019	4,80%		4,80%	20	-65,20%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -64.9
PROFIT/YEAR (%): -15.9
COMPOUND PROFIT (%): -52.3
PASSIVE PROFIT (%): -30.9
NUMBER OF OPERATIONS: 30
NUMBER OF OPERATIONS/YEAR: 7.3
% OF POSITIVE OPERATIONS: 36.7
% OF NEGATIVE OPERATIONS: 63.3
MAXIMUM PROFIT (%): +10.9
MINIMUM PROFIT (%): -71.1

MAXIMUM PROFIT STREAK (%): +6.2
MINIMUM PROFIT STREAK (%): -82.0
AVERAGE PROFIT/OPERATION (%): -2.2
MAXIMUM PROFIT/OPERATION (%): +10.9
MINIMUM PROFIT/OPERATION (%): -24.6
AVERAGE OPERATION DURATION (days): 24.9
MAXIMUM OPERATION DURATION (days): 45
MINIMUM OPERATION DURATION (days): 20
ACTIVE OPERATION TIME (%): 71.6

Volatility 19,45%

50.50

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
05-Mar-2015	19-Mar-2015	10,00%		10,00%	10	10,00%
24-Apr-2015	20-May-2015	0,40%		0,40%	17	10,40%
08-Jun-2015	27-Jul-2015	-15,30%		-15,30%	35	-4,90%
21-Aug-2015	07-Oct-2015	9,80%		9,80%	33	4,90%
13-Nov-2015	02-Dec-2015	4,30%		4,30%	13	9,20%
18-Dec-2015	26-Feb-2016	-8,70%		-8,70%	48	0,50%
08-Apr-2016	27-Apr-2016	3,50%		3,50%	13	4,00%
04-May-2016	25-May-2016	3,60%		3,60%	15	7,60%
13-Jun-2016	15-Jul-2016	-4,90%		-4,90%	24	2,70%
30-Aug-2016	04-Oct-2016	-0,20%		-0,20%	25	2,50%
12-Oct-2016	13-Dec-2016	-2,60%		-2,60%	44	-0,10%
20-Jan-2017	21-Mar-2017	0,50%		0,50%	42	0,40%
19-Apr-2017	09-May-2017	6,10%		6,10%	13	6,50%
07-Jul-2017	28-Jul-2017	2,50%		2,50%	15	9,00%
08-Aug-2017	06-Sep-2017	0,40%		0,40%	21	9,40%
10-Oct-2017	02-Nov-2017	6,00%		6,00%	17	15,40%
18-Dec-2017	29-Jan-2018	2,10%		2,10%	27	17,50%
06-Feb-2018	13-Apr-2018	-6,40%		-6,40%	46	11,10%
25-May-2018	19-Jul-2018	-2,90%		-2,90%	39	8,20%
03-Aug-2018	24-Sep-2018	0,50%		0,50%	36	8,70%
08-Oct-2018	09-Nov-2018	-22,80%		-22,80%	24	-14,10%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): -14.2
PROFIT/YEAR (%): -3.5
COMPOUND PROFIT (%): -18.9
PASSIVE PROFIT (%): -30.1
NUMBER OF OPERATIONS: 21
NUMBER OF OPERATIONS/YEAR: 5.1
% OF POSITIVE OPERATIONS: 61.9
% OF NEGATIVE OPERATIONS: 38.1
MAXIMUM PROFIT (%): +17.5
MINIMUM PROFIT (%): -14.2

MAXIMUM PROFIT STREAK (%): +22.4
MINIMUM PROFIT STREAK (%): -31.6
AVERAGE PROFIT/OPERATION (%): -0.7
MAXIMUM PROFIT/OPERATION (%): +10.0
MINIMUM PROFIT/OPERATION (%): -22.8
AVERAGE OPERATION DURATION (days): 26.5
MAXIMUM OPERATION DURATION (days): 48
MINIMUM OPERATION DURATION (days): 10
ACTIVE OPERATION TIME (%): 53.4
6,98%
Volatility

BUY25
SELL80

Buy dates	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
02-Feb-2015	22-Apr-2015	17,40%		17,40%	55	17,40%
30-Jul-2015	02-Sep-2015	-7,80%		-7,80%	24	9,60%
02-Oct-2015	19-Nov-2015	10,00%		10,00%	34	19,60%
25-Feb-2016	12-Apr-2016	-5,60%	2,73%	-2,87%	31	16,73%
31-May-2016	20-Jun-2016	-10,10%		-10,10%	14	6,63%
21-Jul-2016	07-Sep-2016	0,40%		0,40%	34	7,03%
05-Dec-2016	26-Jan-2017	7,20%	2,96%	10,16%	37	17,19%
23-Mar-2017	04-May-2017	5,40%	2,65%	8,05%	27	25,24%
24-May-2017	08-Jun-2017	-0,80%		-0,80%	11	24,44%
20-Jun-2017	04-Jul-2017	-3,30%		-3,30%	10	21,14%
12-Sep-2017	19-Oct-2017	-2,70%	2,56%	-0,14%	27	21,00%
21-Nov-2017	06-Dec-2017	1,00%		1,00%	11	22,00%
11-Dec-2017	22-Dec-2017	-2,30%		-2,30%	9	19,70%
29-Jan-2018	05-Feb-2018	-5,00%		-5,00%	5	14,70%
12-Apr-2018	06-Jun-2018	-0,60%		-0,60%	38	14,10%
17-Sep-2018	11-Oct-2018	-8,90%		-8,90%	18	5,20%
21-Nov-2018	27-Feb-2019	19,00%		19,00%	68	24,20%

NUMBER OF YEARS: 4.1
TOTAL PROFIT (%): +13.2
PROFIT/YEAR (%): +3.2
COMPOUND PROFIT (%): +8.0
PASSIVE PROFIT (%): -26.3
NUMBER OF OPERATIONS: 17
NUMBER OF OPERATIONS/YEAR: 4.2
% OF POSITIVE OPERATIONS: 41.2
% OF NEGATIVE OPERATIONS: 58.8
MAXIMUM PROFIT (%): +19.6
MINIMUM PROFIT (%): -5.8

MAXIMUM PROFIT STREAK (%): +19.0
MINIMUM PROFIT STREAK (%): -25.5
AVERAGE PROFIT/OPERATION (%): +0.8
MAXIMUM PROFIT/OPERATION (%): +19.0
MINIMUM PROFIT/OPERATION (%): -10.1
AVERAGE OPERATION DURATION (days): 26.6
MAXIMUM OPERATION DURATION (days): 68
MINIMUM OPERATION DURATION (days): 5
ACTIVE OPERATION TIME (%): 43.4

Volatility 6,24%

Average	(X-average)^2	Variance	Standard deviation
16,82%	3,39135E-05	0,0038919	0,062385062
	0,005209443		
	0,000774149		
	7,68201E-07		
	0,010378815		
	0,009579803		
	1,38647E-05		
	0,007093603		
	0,005810026		
	0,001868273		
	0,001749208		
	0,002685678		
	0,000830796		
	0,000448443		
	0,000738561		
	0,013496972		
	0,005449913		

	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
24-Feb-2015	04-May-2015	2,90%		2,90%	46	2,90%
13-Oct-2015	11-Dec-2015	-0,60%	2,22%	1,62%	43	4,52%
29-Mar-2016	22-Apr-2016	-4,70%	2,73%	-1,97%	18	2,55%
12-Aug-2016	16-Sep-2016	-7,10%		-7,10%	25	-4,55%
28-Dec-2016	09-Feb-2017	-5,00%	2,96%	-2,04%	31	-6,59%
05-Apr-2017	24-May-2017	-1,70%	2,65%	0,95%	32	-5,64%
15-May-2018	12-Jun-2018	-1,20%		-1,20%	20	-6,84%
19-Dec-2018	27-Feb-2019	16,70%		16,70%	48	9,86%

NUMBER OF YEARS: 4.0
TOTAL PROFIT (%): -0.8
PROFIT/YEAR (%): -0.2
COMPOUND PROFIT (%): -2.6
PASSIVE PROFIT (%): -32.4
NUMBER OF OPERATIONS: 8
NUMBER OF OPERATIONS/YEAR: 2.0
% OF POSITIVE OPERATIONS: 25.0
% OF NEGATIVE OPERATIONS: 75.0
MAXIMUM PROFIT (%): +2.9
MINIMUM PROFIT (%): -17.5

MAXIMUM PROFIT STREAK (%): +16.7
MINIMUM PROFIT STREAK (%): -20.4
AVERAGE PROFIT/OPERATION (%): -0.1
MAXIMUM PROFIT/OPERATION (%): +16.7
MINIMUM PROFIT/OPERATION (%): -7.1
AVERAGE OPERATION DURATION (days): 32.9
MAXIMUM OPERATION DURATION (days): 48
MINIMUM OPERATION DURATION (days): 18
ACTIVE OPERATION TIME (%): 25.5

Volatility 5,85%

Average	(X-average)^2	Variance	Standard deviation
-0,47%	0,001138219	0,0034187	0,058469307
	0,002493754		
	0,000914306		
	0,001661581		
	0,003740851		
	0,002669014		
	0,004052914		
	0,010678639		

	Sale dates	Performance	Div.	Prfm. Dividends	Days of operation	Cumulative prfm.
11-Aug-2015	21-Aug-2015	-9,60%		-9,60%	8	-9,60%
05-Apr-2016	04-May-2016	-9,50%		-9,50%	21	-19,10%
10-Apr-2017	17-Jan-2018	9,00%	5,21%	14,21%	196	-4,89%

NUMBER OF YEARS: 3.6
TOTAL PROFIT (%): -10.0
PROFIT/YEAR (%): -2.8
COMPOUND PROFIT (%): -10.8
PASSIVE PROFIT (%): -29.2
NUMBER OF OPERATIONS: 3
NUMBER OF OPERATIONS/YEAR: 0.8
% OF POSITIVE OPERATIONS: 33.3
% OF NEGATIVE OPERATIONS: 66.7
MAXIMUM PROFIT (%): -9.6
MINIMUM PROFIT (%): -19.0

MAXIMUM PROFIT STREAK (%): +9.0
MINIMUM PROFIT STREAK (%): -9.5
AVERAGE PROFIT/OPERATION (%): -3.3
MAXIMUM PROFIT/OPERATION (%): +9.0
MINIMUM PROFIT/OPERATION (%): -9.6
AVERAGE OPERATION DURATION (days): 75.0
MAXIMUM OPERATION DURATION (days): 196
MINIMUM OPERATION DURATION (days): 8
ACTIVE OPERATION TIME (%): 24.4

Volatility 5,91%

Average	(X-average)^2	Variance	Standard deviation
-11,20%	0,000254934	0,0034929	0,059100498
	0,006246268		
	0,003977404		