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Bachelor Thesis

Managing a currency portfolio of an enterprise: The risks of employing Technical Analysis

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keywords:
FX Market, Technical Analysis, FX Visual Indicators,
Fibonacci, MACD, Price Action Trading,
Efficient Market Hypothesis

short summary:
    The focus of this research is to validate the applicability of common FX Market Technical Analysis Indicators by means of feasibility tests and asses their general effectiveness when paired with Fundamental Analysis factors. The output consists of recommendations for CFOs that wish to develop hedging strategies on the FX Market.

Supervisor	....	....	....
	Title/ degree/ name and surname	*grade*	*signature*

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Abstract of the research:

This work discusses what factors can heavily influence currency pair price trends of FX Markets and the general effectiveness of employing Technical Analysis from a CFO and a Fund Manager point of view as the main decision factors of establishing entry and exit points on a currency pair when speculating the market or simply looking for the best timing to convert currencies.

The key areas that are discussed in this thesis are related to the FX Market and are as follows:

1. The Efficient Market Hypothesis: all information, all news, hit the price of the currency pair as soon as they go public.

2. Research in the field of Fundamental Analysis and its impact on the Technical Analysis Indicators. I analyzed two recent events, one of a major importance and high profile on the international market: Russia's interference in the Ukraine crisis and its impact on the Russia's Ruble; the second analysis is on a low importance and very low profile: Disturbance caused by Romanian Prime Minister accusations and vote of no confidence for the current Romanian Government and its impact on the EURRON currency pair. The pairs were looked at using StarTrade 360 trading platform, which supports less speculated currencies and provides historical charting.

3. Top Technical Analysis Indicators that are most commonly used today are explained.

4. The concept of if markets adjust to technical indicators. The more an indicator or TA is used, the less market behaves the way it predicts. This is also exemplified via other research in the field.

5. Evaluating the feasibility of the most popular technical analysis techniques. I looked at Visual Indicators and precisely selected 32 transactions to check the effectiveness of Moving Average Visual Indicator, 7 transactions with MACD Visual Indicator as basis, and also has tested some of the most popular Price Action Trading concepts for Day Trading into looking for entry and exit points. All research has been done only on the EURUSD currency pair, and FXPro MT4 trading platform was the selected platform for the test, and certain conditions were followed for each execution.

6. Measuring risks of Technical Analysis and my recommendations for CFOs managing currency portfolios based on latest publications and research in the field and all my findings from my own independent research.

Contents

1. Introduction to FX Market

The year 1982 marked a turning point in global economics as this being the first time U.S. traders were giving the possibility that besides commodities and stocks, to trade also actual currency. This fact soon led to the advent of the Foreign Exchange Market (FX Market). In a very short time this approach spread globally, with many other Governments opening its doors to global currency trade. 33 years have passed since that day and this market has reached the stage of maturity it deserved: the most liquid financial market in the world, grossing over 4 trillion $ as turnover on a daily basis (April 2010, Triennial Central Bank Survey) and still increasing.

FX Market is an over-the-counter market, which implies direct trading between brokers. There is no central authority to impose regulations, although many authorities such as government owned central banks are directly involved in keeping the currency of their country "in check", as the implications of a fast drop or decrease in currency pair of the local currencies has deep, drastic implications in all sectors of their economy. There is however a division between level of access within the FX Market that does favor big time trading over market speculators - this is decided based on the amount of money that they there are in play. This division consists in how the bid and ask prices are set, the gap between these two increases as the level of access gets lowered. Most privileged is the interbank market which consists of leading private banks and security dealers that accounts for about 39% of all FX transactions (September 2010, Triennial Central Bank Survey), followed by smaller private banks and big corporations that have a hedge fund in order to pay or conduct business in different countries.

The concerns that are tackled in this thesis are written from a position of a hedge fund manager of a corporation. A fund manager lives in an extremely volatile world – the FX market is in constant change, the hedge fund manager doesn't have any significant power over the market to influence it – and there is a stream of new research in narrow segments of FX Trading that more or less are connected to their job yet the general overview of what works now in order to develop a hedging strategy is lacking. During my research I wasn't able to find a public paper that actually shows most modern practices and describes the risks associated to them. I also wasn't able to find a practical, high-level overview of the all scientific publications concerning the FX Market to date or past, explained in an easy to understand format. I will attempt through this thesis to create a snapshot of all the situations at play within FX Market from a Hedge Fund Manager point of view– something that is completely missing from our today's broker or fund manager knowledge. I will build a practical perspective in an as elegant manner as possible in which I shall share the summary of my research of all scientific papers and experiments conducted in the FX Market to date concerning trading, followed by my observations on what does indeed make sense and what is actually just plain, noise. Also I will look into two examples of political factors to research their impact on the currency prices and also conduct a feasibility test on Technical Trading Indicators that are popular in the year 2015 for trading on the FX Market. To start with – an introduction into FX Market as a platform for speculative trading. I've chosen this particular setup in order to draw and put forward conclusions for CFOs and Fund Managers regarding what to consider as a risk when they want to create their hedging strategies, with the recommendations being verbosely described in the last chapter of this work.

2. Speculating the FX Market

2.1 Efficient Market Hypothesis

Every Hedge Fund Manager of a Currency Portfolio must first and foremost understand the Efficient Market Hypothesis (EMH) (Cootner, Paul (1964).

This theory states plain and bold: it is impossible to "beat the market" by being knowledgeable, because the pair value always will incorporate all the known information that concerns it. The pair will always have the value it's supposed to be at, never different – therefore it implies that no matter how much market knowledge you have, you will never be able to find a pair that is undervalued or overpriced, since these aspects are already integrated within the pair value the moment new information becomes public. There is more around this theory and its highly speculated, however the conclusion matters: the only way to make profit is to take a "leap of faith", go beyond knowing all available information and plain bold "guessing" the market's next move.

With this in mind we can say there are 3 school of thought for speculating the Forex Market:

Fundamental Analysis – playing the market by "guessing" future big moves of the top traders basing on factors that normally affect the price such as: political and economic conditions, country specific economics – GDP, growth rate, interest rate and so on.

Efficient Market Hypothesis (EMH) – playing the market will always result in a break even. If all the known information is within the price, then there is no "good" decision that a trader can take in order to make a profit.

Technical Analysis – playing the market by "accepting" that all publicly available information and all knowledge and good decisions regarding the price trend are and will be incorporated into the market price. Technical Analysis exclusively is based on historical price data and trends. Technical Analysis has the tendency to simplify things and to bluntly ignore the EMH – this is a must in order for this theory of price change to have any grounds and attempt itself to be recognized as a "scientific approach" to Forex Market forecasting. Technical Analysis is based on 2 fundamental ideas: the price works in patterns created by all publically available information, which gets to be incorporated within the price – same as for EMH – however difference is that Technical Analysis proposes that the price adjustments do not happen instantaneously as EMH implies; and 2nd idea is that all fundamental analysis opinions and overall market sentiment will end up slowly but surely reflected within the price in a similar trend formation as it has already occurred in the past.

The focus of the research that was carried out is to deep dive into Technical Analysis, weight its pros and cons, asses its risks and find out if it has a scientific root. Also Fundamental Analysis and EMH factors are discussed against pros and cons of using only Technical Analysis. This work will benefit a CFO and anyone who is managing a currency portfolio by providing a repertoire of information on how political events create volatility and also clear examples on the effects of using technical analysis only in speculating price action.

2.2. Statistics of FX Rates

The difference between a Communist and Capitalist society is the existence of price. The biggest problem a Communist society has is pricing things. Since there is no active competition, it is very hard within a closed Communist society to really understand the value of a certain commodity, and it has to rely on outside factors to do so. A capitalist society on the other hand is more successful if the leaves the notion of price completely up to the market itself, unregulated. The less government interference there is within the market, the more successful the market is deemed. The FX Market is an unregulated market that showed its head naturally, right with the start of Globalization, which would not be possible unless the advent of the FX Market and free trade. The definition of the FX Market is that of a change in a market value relationship of the ratio between two currency pairs of two different countries that are engaged in trading (Long and Walter, 2001) and it enables the transference of funds within the two countries. The USD is the reserve currency for FX Markets and this started after 2nd World War, because it was the only currency that was still backed by gold. However the USD experienced tremendous inflation, yet still remains as the reserve currency, albeit some countries i.e. China are trying to diminish its role. In 1973 the Floating Exchange Rate system was established and made the FX Market the most volatile of them all. All currency pairs are still today traded against the USD, mainly due to keeping things simplistic, to avoid the complexity of markets trading against each other and to avoid triangular arbitrage – if all currencies are traded against USD, there is only one cross rate and no arbitrage (Grabbe, 1996).

2.3 FX Market Prince Interest Point

Every Currency Pair fluctuation when traded via the modern platforms is measured. The smallest amount of such fluctuation is called Prince Interest Point - PIP. A change of a PIP is normally associated with the change of 0.0001 for USD, which is a change of 1% of 1% of the base value of the pair. This value matters and is statistically significant because it's easy to represent as the standard unit of calculation for FX Trading. A change of a PIP in any direction is followed by a gain or loss of money. Some brokers even started offering fractional PIPS – 1/10th of a PIP for providing an extra digit of precision when quoting currency pairs.

Yen-based quoted currency pairs are the only exception to the 0.0001 PIP rule, that is they are quoted to only two decimal places 1 PIP = 0.01.

As a general rule, the PIP value increases or decreases based on the underlying value of the currency which is being purchased.

2.4 FX Market Currency Spread

Spreads are based of the Buy and Sell price of a currency pair. The spread is calculated based on lot size and by subtracting from Buy price the Sell price. These spreads are also variable and are given by the trading software which the broker uses.

Figure 2.1 Shows elements that are connected to identifying and calculating the Pip Spread.

The spread can be calculated by subtracting the Sell price from the Buy price of the pair. In the case above, the spread is 2.1 PIPs, which is 0.00021. The spread always stays actual to the price the Forex broker is paying. This means that when you buy you get the Buy end of the spread, and when you sell you will have to pay the Sell end of the spread, therefore in any trade you undertake you will always be paying the Spread amount of PIPs.

Broker companies are not regulated for having a common spread, therefore it is not uncommon to be given different spreads on different platforms. Many brokers also apply different spread levels depending on the volume of your Portfolio, and by means of having a competitive advantage a broker is willing to lower his spread in order to secure a customer.

Because of the spreads not being regulated, some broker companies offer variable spreads that are bellow typical fixed spreads in order to attract customers. It is important to know that variables spreads are easily impacted by times of high volatility and frequently a broker will increase the spread when such situations occur.

3. Political factors influencing Currency Pair Rates.

A note for introduction:

There are many Fundamental Analysis factors that influence the market to move in a certain direction. Most of them are economics related in nature, however – the best and most high impact indicators based on my experience have always been the political ones, which indicate some sort of political instability scenario in a certain region that has its own currency traded on the FX Market. A CFO's decision can have a dramatic impact on company's profit, and looking at the two examples with I provided bellow should justify why a CFO's responsibility must be to pay attention to political events that impact the countries in which his company has open trades with.

3.1 Russia's Ruble during its involvement in the ongoing Ukraine Crisis

Political factors play a definitive role in the currency pair rate. Let's take March 2014 as an example – the start of the Ukrainian revolution. Russia, which declares that it was initially not involved, officially soon became a key player in these activities and pinned the whole West against it by overtaking Crimea from Ukraine. This information as the TA argues is reflected in the price (Figure 3.1). Further developments such as the decrease in oil pricing worldwide furtherly widened the gap between the Russia's ruble and the USD.

Figure 3.1. This graph shows a very volatile up trend on the Ruble chart compared to USD, taken via Yahoo Finance. Compared to 7.1.2014, the ruble has lost its value more than twice on average.

During many months of year 2015, Russia's ruble was closed for trading on many consumer available online trading platforms – decision taken by platform owners in order to protect its traders against the unparalleled volatility of the ruble.

However, looking back on the Historical data, we can see that the current spike is not something unheard of when considering these 2 pairs and the pair rate seems to be doing nothing less than showing an on-going "fight" for the last decade (Figure 3.2).

Actual	Previous	Highest	Lowest	Dates	Unit	Frequency
50.91	51.58	72.45	0.98	1993 - 2015		Daily

Figure 3.2. Figure above shows the Highest- Lowest on years 1993-2015 RUB/USD pair, taken via Yahoo Finance web tool. The variations show that there have been some very volatile movements in the ratio in the past as well.

Besides the political struggles within Europe as of now, there are also economic problems within Russia that seem to be reflected within the price.

The effect of these news is becoming apparent in the pair rate, as besides the importance factor, simply adding any news of poor performance is enough to strengthen the market sentiment on that the Ruble's strong downfall is not unnatural (Figure 3.2), and the late rehabilitation of the Ruble is also reflected within the price – slower inflation, lowered Key Rate (Figure 3.3).

As of June 2015, Russia is still involved in the conflict and the politics continue to create instability in the region, impact all neighboring countries and the general wellbeing of the global economy which is most evident in the currency market.

Since the information of what is really happening in Russia is to some extent limited to foreign investors, we can argue that the price of the pair could not possibility contain all the information which is meaningful to the country's economics. A CFO, who's corporation has trades in Russia should work to secure that he has access to information that is outside the spectrum of what is offered via public press and news channels, because of the high volatility of the ruble trading at the wrong time can turn profits into loss.

Related

Russia Inflation Rate Slows in April
Russia Lowers Key Rate to 12.5%
Russia Unemployment Rate Edges Up in March
Russia Trade Surplus Widens in February
Russian Economy Stalls for 2nd Straight Quarter
Russia Inflation Rate Edges Up in March
Russia 2014 GDP Growth at 5-Year Low
Russia Unemployment Rate at 2-Year High
Russia Trade Surplus Narrows in January
Russia Cuts Key Rate to 14%
Russia Inflation Rate Up to 13-Year High
Russia Unemployment Rate Rises in January
Russia Trade Surplus at 3-Month Low
Russia Inflation Rate Up to 15%
Russia Cuts Key Rate to 15%
Russia Unemployment Rate at 8-Month High
Russia Trade Surplus Shrinks in November
Russia Inflation Rate at 5-Year High
Russia Unemployment Rate Edges Up to 5.2%
Russia Raises Key Rate to 17%

Figure 3.3. Economic factors that appeared as news from Russia on Yahoo Finance 1st of January -16th of June 2015

Listed above are economics related factors that were triggered during first six months of the year 2015, taken via Yahoo Finance web tool. As we can see there is a strong pattern of negative effects over the economy, followed by Government incentives to offer stimuli for recovery.

All mainstream FX Market trading platforms closed access on and off throughout the first part of the year 2015 to Traders for all trades involving Russian ruble, in order to protect their Trader clients against its volatility, and possible latency problems that their platforms might suffer of due to overflowing amount of trades.

Although everyone is expecting the Russian ruble to have a strong down trend, there are many political factors at play and since the Russian news channels are not independent from the Russian Government, information coming from Russia can easily be manipulated and Russian corporations have a strong incentive to buy ruble in order to maintain a volatile price.

This example from above can be seen as backing up TA with empirical data, but in such a nature that is too volatile for speculation. All known, publicly available information seems to be arguably within the pair price fluctuation, yet unable to trend and make profit basing on it.

3.2. Recent political instability climate in Romania 5th of June, 17th of June

A low impact incident of political nature can still have a noticeable impact in creating a wave of price movement between impacted currencies. In this example, Romanian Prime minister Victor Ponta was accused of corruption and its real time impact on the RONEUR rate.

How it happened:

The RON had a very stable fluctuation for the last few years, due to BNR – Romanian National Bank and very safe maneuvers to keep EUR in check. However, on 5th of June 2015, there were 2 news that made headlines about Romania internationally:

1) Prime Minister Victor Ponta has been accused of Corruption

2) The Opposition launched a Motion of No Confidence against current Government led by Victor Ponta.

Both item 1 and 2 hit the news around the same hour, at 11:50AM. The news were 30 minutes later taken by BBC, CNN and other international news media.

Figure 3.4. Showing pair price and timing of main event in a graph. Snapshot was taken from my portfolio, using Trading Platform Startrade 360, a trading platform which trades on EUR/RON pairs

The news were not initially interpreted negatively to the extent of impacting the currency, since everyone was expecting Victor Ponta to step down, relinquish his immunity and go to trial.

The flow of events on 5th of June was as follows:

- At 1pm Victor Ponta was asked to resign by President Klaus Iohannis

- At 2pm Victor Ponta publicly said he does not wish to resign and that he is innocent, and this is just an incorrect political maneuver led by the Opposition to take down the government.

This started to root within investors the idea of political instability, and this can be easily seen in the EUR/RON price chart.

At the opening of Monday 8th of June, the RON was kept very low, yet external investor pressure to Sell RON and Buy other currencies overflew the market in a strong, unstoppable Up trend. The trend was hard to be kept in check by local investors who are trying to fight external pressures, therefore the currency quickly turned very volatile and hard to trade on.

Later news that followed are:

- Parliament reassuring Victor Ponta of his immunity.

- Victor Ponta's political party, PNL wrote letters to all embassies that Romania has partnership with, about how this corruption case is an internal joke led by the Opposition which he accuses as manipulating the National Anti-Corruption Agency – DNA that is pressing charges.

- Opposition failed to secure the motion of no confidence on Friday 12th of June.

- Victor Ponta health problems: on 17th of June 2015, he is no longer able to continue the trial due to an injury to his knee while playing basketball, which will require him to be hospitalized for one month, therefore the political instability situation will continue for at least one more month.

These news were attributed as well to the Sell pressure of RON currency. Many local politicians and analysts are accusing Victor Ponta of negligence and the Parliament of damaging the economy in order to protect one person.

I will analyze how, if at all, this is reflected in the EUR/RON currency pair. For finding out this information, I opened an account on StarTrade 360 a Romanian platform which accumulated historical price data and is able to show all the trend movements of the week in which the political actions were at play. It is very easy to spot on the historical graph of EUR/RON (Figure 3.5) that the day right after the incident, Monday 8th of June has been heavily impactful over the RON currency's stability. Losses of more than 700 units of actions, also called Pips were registered by the EUR/RON pair ratio in one day. This has happened due to events occurring late Friday, close to bank closing times. The expectancy was that on Monday many investors will move money out of RON, and they were right in predicting so.
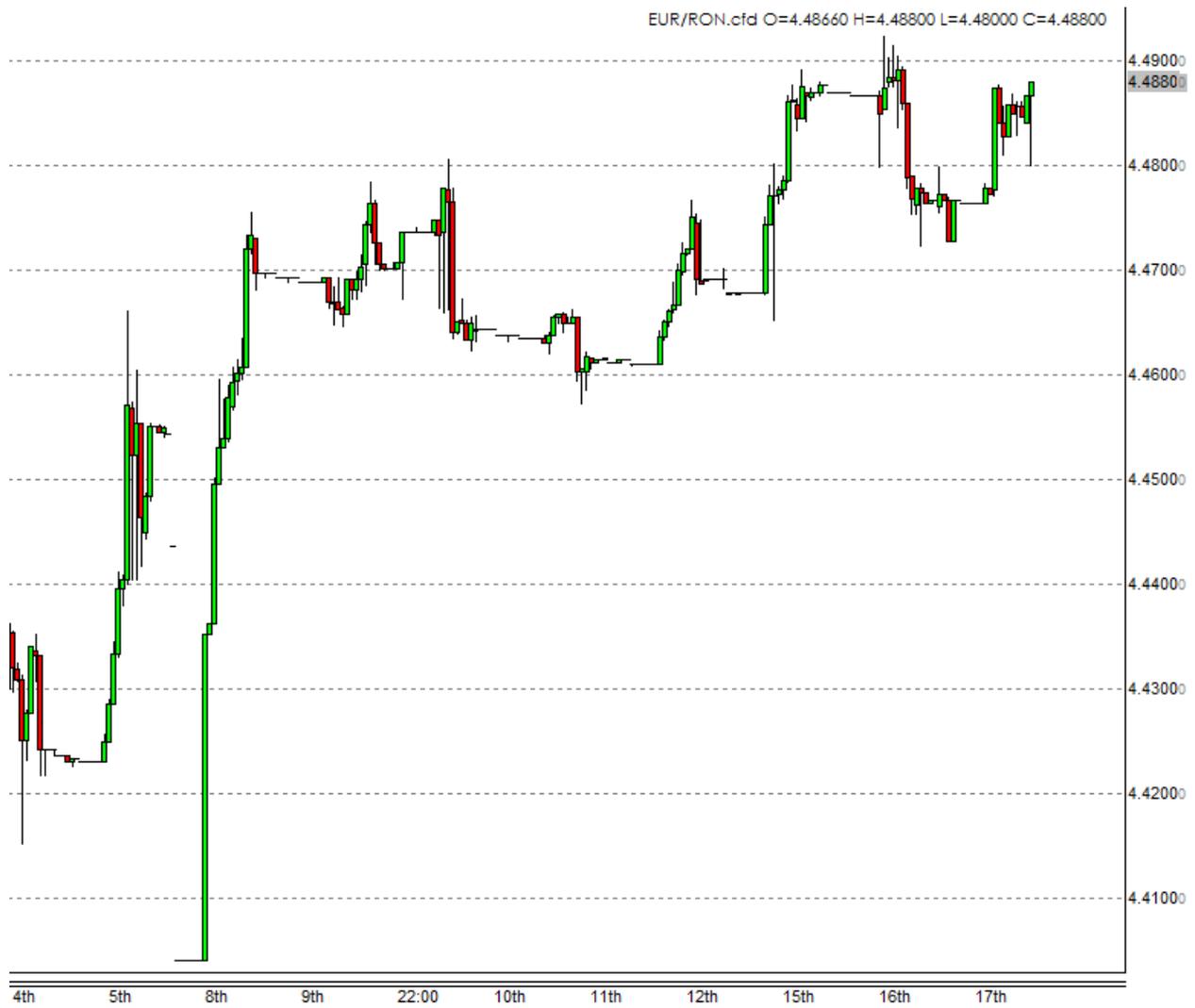
Figure 3.5 Monday 8ᵗʰ of June RON drop and continuous drop until present day 17ᵗʰ of June. Snapshot from above was taken from my portfolio running on StarTrade 360 platform which supports RONEUR pair.

As we can see, since 5ᵗʰ of June, before the political mess started, EUR/RON was trading at 4.3234. On 17ᵗʰ of June, the pair reached 4.4905. This is 1671 units of movement, also called Pips in an "Up" trend, RON reaching lowest parity against EUR in the last 5 months due to a few political incidents which should not have any connection with the economic stability of the country that has had a sustainable continuous growth rate after the end of the Communist era.

Political related news are found to be the most influential and predictable when it comes to price movements. All analysts were able to confirm that the RON will have a drastic drop, and a good trader could have reacted fast in order to be able to take in from the wealth that such news can bring when they become public and impact the price.

3.3 Summary on both cases and how FA triggers TA

The main point of these two cases are to show that although news are reflected in the price, there are certain situations in which although the news showcase the trend, the price itself can become either too volatile to be subject to Technical Analysis or there can be factors that impact the FX Trading very suddenly, via a "Breaking News" mechanism, which gives a very short time to react either to close opened trades or to start new ones. Such situations can render the TA approach useless, or incur severe losses to a trader that does not pay attention to all type of news related with the currencies he is working with. In both examples, a Trader can expect that the political instability will definitely price the currency pairs in a down trend, yet due to the volatility of the market, particularly with the involvement of big banks, if a Trader uses Stop Loss features while trading, these Stops will occur and close his positions although the trading trend of his position was correct. There is unproven speculation that many big FX market players do such volatile maneuvers of buying/ selling heavy amounts to move the market fast on purpose, in order to close in and take profit from small or medium sized Portfolios.

Looking at these Fundamental factors and the impact they have on the currencies of the regions that are being influenced, it does seem that the currency pairs seem to be lagging behind the news. Especially obvious is in the 2nd example, concerning EURRON, where the biggest impact on the currency was not when the news hit, but the very next day, on Monday. This can be an argument against Efficient Market Hypothesis, as on Monday there were no related news regarding the incident, at least not as many as on Friday, yet the impact was much more drastic. If all information is within the pair price, it does seem possible that this might indeed be correct, however it seems unlikely that this information gets absorbed within the price immediately after it gets published; which might give a Trader a chance to react and make profit.

From a CFO perspective, events of political instability should be natural triggers to quickly convert the currency out of the impact zone in order to secure profit. Both of these examples show that Fundamental Analysis cannot be ignored and must be considered a main catalyst that pushes the price. There seem to be more and more countries that are hit often with political instability this decade, especially after the economic crisis. For a CFO, violent currency swings caused by factors as the ones mentioned above might become the norm, and might require CFOs to rethink their hedging strategies. Changes to the conventional business plans, relationships with suppliers and distributors as well as corporate structure and even the price of the products must be done in accordance not only with internal company pressure and direction of the business, but just as well with the external climate of the business, the countries that the company is trading in, the political factors at play and the overall health of both the industry and its suppliers and the economies and stability factors of the countries in which the trades are executed. All seem to be of equal importance when considering that if any of these aspects are neglected, very easily a successful trade can become a profit loss.

4. Technical Analysis: a historical look at wave movements of FX market

In our modern day era, there is no well documented Fund Manager that has managed to achieve a constant level of profit by not making use of Technical Analysis as a trading style. There is something inherent within human nature and its survival instinct, that when we see a chart we already start looking for a possible pattern – and since the chart indicator can only go two ways, we are very prone to attribute our success/ failure to how we read that chart. Correlation should not imply causation, and this is the most debated argument of TA. Which, if any, TA indicators are actually statistically significant as a profit generator?

Let's start by having a look at what "history of trading" implies. Price changes and volumes of transactions are recorded and then nailed to fundamental changes within the economic and political spheres that might have influenced the price (Edwards & Magee,1997); the noticed patterns are expected to bounce, once a similar climate appears again. Looking at these patterns TA provides to the Fund Manager a standalone trading platform on which he does not really have to take decisions; decisions were already taken in the past for him. If a remerging pattern did not create profit, then the assumption is that either the Fund Manager entered or exited the trade too fast or too late, therefore the misfortune is a mistake in how the Fund Manager applied the TA, not in the TA itself (Schwager, 1999).

As demonstrated with the help of the examples above, Fundamental Analysis and underlying the pain points of the currency pair plays a very important role in the price of the pair. However, TA argues that political events as such, are not the only factors at play in the market's own way of determining the price. There are other things such as consumer confidence, supply and demand on country goods and even the irrational sentiments, fears of instability, uncertainty that end up changing the price in ways FA cannot predict (Kaufman, 2005). TA argues that there is no need for Fund Managers to study all these factors, and instead they can resort to only looking at the price, which would have it all already incorporated and reflects the market psychology that is actually what ends up ruling the price direction (Edwards & Magee, 1997). What makes TA work is the theory based on which price adapts slowly and irregularly to the new information that impacts it due to noise news, herding behavior of many traders and overall chaos (Park & Irwin, 2004). Also, Grossman and Stiglitz (1980) concluded in their paper that price cannot fully reflect all the information on the market because the information itself is also associated with a cost. Arguably, there are proven theories and Indicators that have shown a statistically significant success rate in providing a return of investment giving enough time and a very efficient application of the theory in practice. I will show all these statistically significant Indicators in the pages to follow.

Park and Irwin (2004) found evidence by looking at charts until early 1990 that some technical indicators are statistically profitable. Also Sullivan, Timmerman and White (1999) researched with empirical data the use of tools that support TA between 1897 and 1996 and their finding was that any of the TA tools were actually more efficient in playing the market than by using a buy-and-hold strategy until 1980. After this year, there is noticeable less efficient usage of the TA tools, therefore one can only draw the conclusion that perhaps the Forex Market after 1980 started adapting itself to the TA rules, self-regulating itself and including within its price movements the "trend seekers" that are the TA Fund Manager folks.

Coming closer to the present, TA is slowly becoming a methodology widespread within the FX Market and dominant. Taylor and Allen (1992) reported in their paper that 90 percent of Forex dealers in London use TA, and 60 percent consider TA to be at least equally important to FA in playing the market. TA also seems to be by far more popular with Intra Day Traders, traders that are trading the market on 15 minutes spreads on a daily basis, which is natural since FA has barely anything to say on such a short term. We can arguably say that Day Trading has been born with the advent of TA. Hutcheson (2000) found that TA is more adequate at short term movements of the market. Park and Irwin (2004) conducted their own surveys to find out that TA is now widely used by all big time market players within the Forex Market. There are also a number of studies that were done into the area of profitability of the TA tools. In the past TA might have been considered not profitable, but with the introduction of efficient computing things have changed.

There are examples of positive gains obtained via Technical Analysis reported via studies:

LeBaron (1999) found very compiling evidence that Fund Managers who are trading with rules in mind, general statements of commitment on when to enter and exit the market seem to be making more profit than simply following a "gut" feeling. Which in itself tends to disprove the idea that market is pure chaos.

Neely (1997) did a run test for 10 different trading rules to the USDDEM exchange rate during a sample period of 23 years, and found that almost all of the trading rules were profitable.

Within 1990 and 2000 there are quite significant amount of studies showing that TA in Forex markets has been profitable (Taylor 1992; Olson 2004). After 2000 there seems to be a decrease of such studies, however it seems that the studies which did indeed happen showed that the trend for TA profitability seems to be decreasing (Neely & Weller 2001; Olson 2004). Again in these studies the profit decrease of TA is connected with the advent of computer power and software that is seeking profit which slowly starts to become a big share of the market players (Sewel, 2007). A new era is starting on the Forex Market, that is called micro-trading: very fast executions of very small number of PIPs based on some trading rules that are deemed profitable make it possible to speculate on the FX market which earlier was regarded as too fast and difficult to invest in (Johnson, 2009), but no longer by humans but by machines instead. There is now slowly the belief that the future of the Forex Market lies in micro-transactions, and an irrational fear is taking over: what would happen if all micro-bots would decide to terminate the same trade at the same exact time.

4.1 Most common Technical Analysis Indicators

4.1.1. Candlesticks charting

The candlestick is the most basic trend analytics indicator that is a must for any Trader planning to use TA. The "candle" depicts currency pair's value at open, high, low and close of a specific period. The candlestick has a wide part, which is called the "real body". This real body represents the range between the open and close of that period's trading. When the real body is filled in or black, it means the close was lower than the open. If the real body is empty, it means the opposite: the close was higher than the open. On the top and bellow the real body are the "shadows". Chartists have always thought of these as the wicks of the candle, and it is the shadows that show the high and low prices of that period's trading. When the upper shadow on a down day is short, the open that period was closer to the high of the interval. And a short upper shadow on an up period dictates that the close was near the high. The relationship between different prices in a period of time (period being the candle) determines the look of the candlestick.

A series of candlesticks show all the relevant information that should be taken into account when making a TA trade, including the general trend of a set of periods. In itself, candlestick charting gives the Trader enough information to decide if there is or not a strong trend in any direction.

The idea of such a style in charting originated in Japan 1700s, developed by Homma, a trader in the futures market, who understood that besides a clear relationship between price and supply/demand, there is also the human emotion at play, since the rice price he was speculating on was not always in perfect correlation to the demand/ supply relation. The principles established by Homma are the basis for the candlestick chart analysis, which is used to measure market emotions surrounding a currency pair or stock. Candlesticks and their origins were introduced and explained to the Western world by Steve Nison in his book, *Japanese Candlestick Charting Techniques.*

Candlesticks can be interpreted in many ways depending on their size, shape. Popular terminology for candles shaped in such ways that determine entry points are: Doji, Engulfing, Harami and Kicker candlesticks all show a reverse of price trend and usually are signals for buy/sell.

To understand the candlestick, a visual representation is necessary (Figure 4.1) because this is its purpose: to visually represent trends in frames of time.

High Price of period (wig)

Closing price of period

Opening price of period

Candlestick body. Most commonly candlestick bodies are blue or empty if the price increased from the open of the candle to the close of the candle· In my FX tool, candlestick bodies that are bearish are Empty

Low price of period
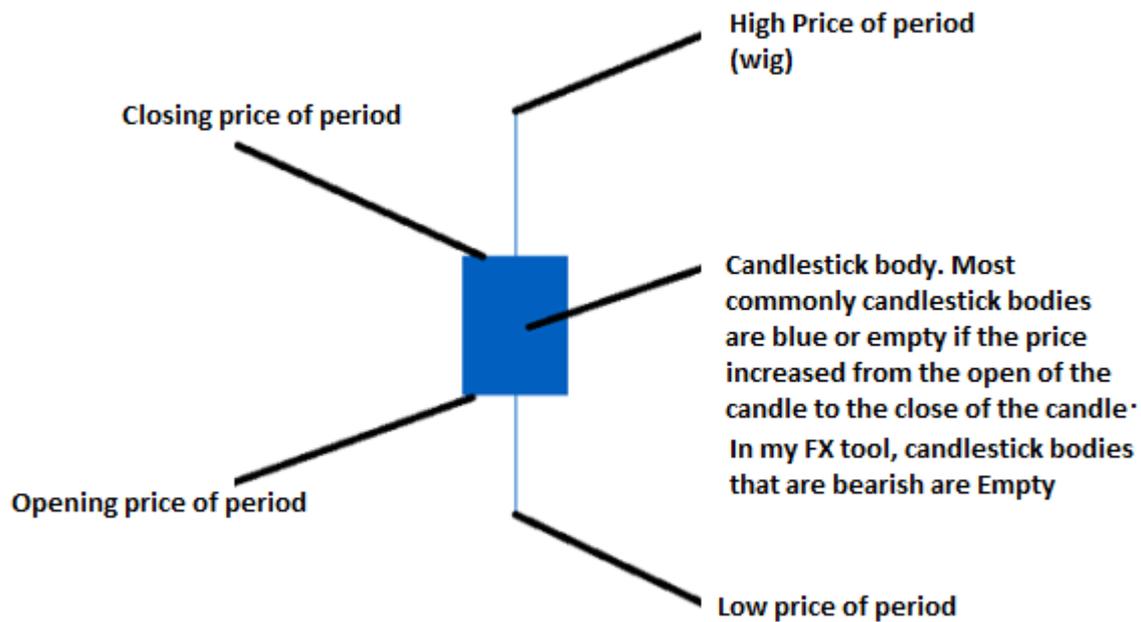
Figure 4.1. The concept of candlestick is explained and visualized

The opposite closing and opening price reflect a "red" or "filled" candlestick, which denotes a down trend for the period. The candlestick is formed on a period. The period is defined by the trader and once defined that particular period becomes the candlestick. Multiple candlesticks are shown on a timeframe composed of multiple periods, which generates a candlestick flow.

All trading platforms that are made commercially available support candlestick charting. Patters in candlestick flows are easy to spot because they are quite common in occurace. Typically they are oftenly used by Day Traders today. Some Traders might argue that they create too many fake signals and this style of TA leaves a lot of room for errors according to Technical Analysis practicioners, however followers of Price Action subgroup of Technical Analysis argue the opposite.

Figure 4.2 Chart composed of Candlesticks on a timeframe matched against moving averages of different timeframes. Taken from my portfolio

If relying solely on Candlestick interpretation might be too much, there is a more simplistic and arguably effective way of manual TA: Support and Resistance, which I would like to show the theory behind it, and in a later chapter show a small feasibility study result based on using it.

4.1.2. Support and Resistance Indicators (S&R)

S&R is one of the best perceived technical trading Indicator. This Indicator more than all others play on the psychological factor of Trading. That is the market players "desire" or "fear" that a price will pass a certain imaginary threshold that in reality holds low to no intrinsic value in the overall currency pair fluctuation. A good example of a good resistance from a Fund Manager perspective is when he notices that a currency set hits a few times a higher or lower value than normal, yet it never actually reaches it. The more times the higher value is hit then the Fund Manager assumes that the resistance for that price is stronger, and the more times the lower value is hit, the support is stronger. This acts as an imaginary ceiling and floor price, which TA dictates that the market will not want to go above (resistance) or bellow (support) lines, therefore it will statistically be more likely to trend back to a more natural state. The recommendation to the fund Manager is to "Sell Short" when close to the Resistance, and "Buy" when close to support (Figure 4.3).

Figure 4.3. I selected a few time frames on EURUSD and drowned resistance and support levels according to the theory.

It is very often that we see Technical Traders use candlesticks mapping, together with support and resistance in order to forecast price movements. Most of the TA traders do not rely only on that, but also tend to incorporate "predictive" trend Indicators such as the Fibonacci Retracement.

An important note when considering support and resistance. These particular Technical Analysis Indicators can be interpreted as Fundamental Analysis factors as well, simply because bellow specific trading prices that certain goods are expected to trade at, if the currency ratio between the countries engaged in trading goes bellow an expected price limit then the trade itself will be affected. A major company or bank which is involved in international trading of either a commodity or a currency conversion will want to keep the price of the pair fluctuating around certain thresholds in order to secure profit, and knowing which companies, what are their trading needs and their possibilities to move the size of capital needed to impact the market can give a CFO a major advantage in defining his hedging strategy. This is my own speculation, I have not seen any research done in this field.

4.1.3. Fibonacci Retracement

This indicator is based on the Fibonacci sequence, which is speculated to be a phenomenon omnipresent in nature, from the distribution of petals in a flower, up to how the Forex Market trends of a currency will tend to move. The discovery of this phenomenon is attributed to Leonardo Fibonacci, a 13th century mathematician. The method to calculate the Fibonacci sequence is not complicated at all; simply adding the next number to the existing sequence will draw out the Fibonacci sequence. Example, if first number is 0 and second is 1:

0	+	0	=	0
0	+	1	=	1
1	+	0	=	1
1	+	1	=	2
2	+	1	=	3
3	+	2	=	5
5	+	3	=	8
8	+	5	=	13
13	+	8	=	21
21	+	13	=	34

The first 10 numbers of the Fibonacci Sequence are: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34.

The sequence itself gives birth to a ratio, which will include the percentile 61.8% that is called "Golden Ratio", which is the most significant for traders. There are also 38.2% and 23.6%, however these ratios tend to have a lower rate of success.

The Golden Ratio can be obtained by dividing whatever number from a sequence by the number that follows it. What number is chosen is irrelevant, because the answer will tend to be close to the mean average of 0.618, example:

- 8 / 13 = 0.615 = 61.5%

- 13 / 21 = 0.619 = 61.9%

- 21 / 34 = 0.617 = 61.7%

The other significant 2 ratios are obtained in a similar fashion, however with a small twist. 38.2% is to be obtained by dividing any number to the 2nd number to the right, while 23.6% by diving any to the 3rd number to the right.

This seems to be "magical", and I haven't seen any scientific research done on it, however the trader community is flooded with good results, 80% win rates and tutorials on how to make this as the Lead Indicator for trading and is present on any currency trading software out there. Why are traders so inclined to rely on unproven "techniques"? William Hoffer, in the Smithsonian Magazine, wrote in 1975: "The continual occurrence of Fibonacci numbers and the Golden Spiral in nature explain precisely why the proportion of .618034 to 1 is so pleasing in art. Man can see the image of life in art that is based on the Golden Mean". Perhaps the idea that traders wish to see the "patterns" of the FX Market as a form of expression of human art, which in itself gives a trader confidence to place their money in "good faith". There is also a growing speculation, that if traders will start using Fibonacci - albeit unproven – more and more, slowly the currency pairs will adjust to it, incorporate it, and patterns therefore will emerge. Perhaps the human behavior and the market price

movement are deeply intertwined, however this cannot be taken as fact until proven. Further research is required in this field, and since it's a predictive Indicator, the only way to do this research would be for a Scientist to sit live on a trading platform for a few years, trading only on the Fibonacci "Golden Ratio" to bring forth any statistical worthy evidence.

It is a known fact that where there is too much data generated, for example in our case – currency markets, that it becomes quite easy to find correlations with almost anything. Yet this method is widely used and viewed as one of the most efficient.

I have plans to use this method during the Price Action simulation run and will describe consequences in the next chapter on the next page.

5. Feasibility test of most common TA indicators

I have selected Moving Average, MACD and Price Action styles of Technical Analysis typically used during Day Trading. These are very common and yet I cannot find any scientific evidence that proves the success of these indicators in any of the publicly available scientific papers in this field and I want to bring forth any conclusive evidence on if they can really be attributed to a successful trade. Because of the limited time and my intent to do the trading live in order to not be influenced by available data, I limited scope of the runs to 32 MA entries, 7 MACD entries, 2 PA entries. All information coming from FA has been disregarded and a strict attention has been put only to the TA factors at play which are described for each run, because this is what the theory behind TA states: Fundamental Analysis factors are all within the price and can be disregarded.

5.1 Moving Average feasibility test

Moving Average is the simplest technical indicator out there, common in most Fund Manager TA indicator pools, with a very straight forward way of operating: if price is above the average of the price on a particular interval, then it is labeled as an "Up" trend; the opposite is a "down" trend. Most Day Traders use the 15 minutes candlestick formation moving average (M15), as it has been reported many times as being in the money for Day Trading. In my simulation I will do the same. The 15 Minute moving average will be used as a sole indicator for deciding when to enter the market for EURUSD pair to enter on either Sell or Buy, as a clear opportunity arises according to the Indicator. The moving average formula that was used is the last pair EURUSD price average on a M15 interval divided by number of periods. The result is the average over all the periods and their fluctuations are being dimmed down. The main benefit of analyzing this way is that the Trader understands if the price is either too high or too low for the current period.

I set the following conditions for the run:

1. Platform that was used to conduct the simulation was FXPro MT4 (www.fxpro.co.uk)

2. Simulation was conducted in real time by paying attention to Moving Average visual Indicator.

3. The start date 2015.06.08 9:10 AM CET

4. End date 2015.06.16 at 12PM CET

5. Lot size up to 0.2. Maximum spread I used for Stop was 30 Pips.

6. Moving average was drawn on M15 in real time.

7. Entry points: Since the test was live, I used as entry points the times when the pair was either overpriced or underpriced in relation with the moving average.

8. Stop was set for 30 pips in both Take Profit and Loss direction for all entry points.

9. Exiting was when the pair price was intersecting with the moving average, either on Buy or Sell.

10. If moving average was changing its course and not going with my trend I would close the position with 30 Pips maximum loss.

Example of 6 charted decisions on the moving average (Figure 5.1)

Figure 5.1 Part of my Portfolio, screenshot taken from FX Trading platform, FXPro MT4. Example of 6 charted decisions on the moving average.

Above are listed a few examples of unsuccessful executions. Red dotted line represents Sell orders executed, red continuous line is the moving average.

Based on the 15M moving average I decided entry points on Buy or Sell, depending on trend pattern. There was many times noticed that the pattern predicted by the moving average indicator does not seem to behave in ways that clearly identify with a trend, however I pursued in applying the indicator and stuck with my initial strategy through the entire run.

After one week, 32 live trades were successfully accomplished. The results of my portfolio were as described in Figure 5.2 on the next page.

Initial deposit	10000.00			Spread	30
Total net profit	-422.28	Gross profit	127.90	Gross loss	-550.18
Profit factor	0.23	Expected payoff	-13.20		
Absolute drawdown	438.78	Maximal drawdown	451.58 (4.51%)	Relative drawdown	4.51% (451.58)
Total trades	32	Short positions (won %)	24 (12.50%)	Long positions (won %)	8 (37.50%)
		Profit trades (% of total)	6 (18.75%)	Loss trades (% of total)	26 (81.25%)
	Largest	profit trade	65.80	loss trade	-56.40
	Average	profit trade	21.32	loss trade	-21.16
	Maximum	consecutive wins (profit in money)	1 (65.80)	consecutive losses (loss in money)	9 (-171.80)
	Maximal	consecutive profit (count of wins)	65.80 (1)	consecutive loss (count of losses)	-171.80 (9)
	Average	consecutive wins	1	consecutive losses	4

Figure 5.2. The Portfolio balance at the end of the Moving Average Feasibility test

The results were worse than I expected, 81.25% of the trades have been lost. Since this run was done based on a single visual Indicator there are a lot of errors that potentially could have been made. Perhaps this is a small sample, errors in my entry points or fundamental market factors that maybe I should have paid attention to and was not informed of at play. However, we must take in consideration that most Fund Managers that do not rely on automated robots for decision making are doing these mistakes as well, and their results, as well as my results are subject to interpretation and heavy scrutiny. There is no perfect way in using this indicator, recommendations vary from Fund Manager to Fund Manager. What the common perception seems to be, is that the more you use it, the more efficient you become at it, although it has not been proven yet that the market does indeed move in patterns and that experience, not luck, does actually generate more profit.

There is the belief in the TA community that the Moving Average Indicators work better when they are used simultaneously – a method called MACD – on different intervals. I also did a simulation for this, in an attempt to bring forth additional evidence that can either credit or discredit the MACD Indicator which seems to be growing in popularity.

5.2 Feasibility test for MACD TA Indicator

MACD, short for Moving Average Convergence Divergence, is a momentum indicator that follows two moving averages on the same currency pair, most used interpretation of it is to subtract the 26-day exponential moving average (EMA) from the 12 day exponential moving average. On top of this there must exist a 9 day exponential moving average which is used as the trigger for entry points in the market. This is a recent addition to TA repertoire of tools, created by Gerald Appel, chairman of Signalert Asset Management and made public through his books. The Visual Indicator is showcased in Figure 5.3.

Conditions I kept in mind to comply with in this run:

1. Simulation was conducted in real time, by paying attention to the MACD visual Indicator.

2. The start date 2015.06.08 12:20 AM CET .

3. End date 2015.06.16 at 10PM CET.

4. Lot size up to 0.2.

5. Maximum spread I used for Stop was 50 Pips, 20 Pips higher because there are less entry points that are indicated based on this model, comparing to a simple moving average.

6. I will never trade against MACD. If in real time I spotted the next MACD line going in the opposite direction, I would close the trade.

7. I will try to minimize risks, strategy was not to play for maximum profit, but just to open successful trades.

8. Only open a position if at least 3 MACD bars show the same trend and the differences between their growths is somewhat equal.

Figure 5.3. Example of two successful trades based on the MACD plot, at perfect entry points. Blue dotted line represents my opened Buy position, while the red dotted line shows a Sell position.

I found this method although slow in finding entry points, very efficient. The results of the transactions are shown in Figure 5.4.

Initial deposit	10000.00			Spread	50
Total net profit	25.77	Gross profit	25.77	Gross loss	-0.00
Profit factor		Expected payoff	3.68		
Absolute drawdown	114.40	Maximal drawdown	114.40 (1.14%)	Relative drawdown	1.14% (114.40)
Total trades	7	Short positions (won %)	2 (100.00%)	Long positions (won %)	5 (100.00%)
		Profit trades (% of total)	7 (100.00%)	Loss trades (% of total)	0 (0.00%)
	Largest	profit trade	5.00	loss trade	-0.00
	Average	profit trade	3.68	loss trade	-0.00
	Maximum	consecutive wins (profit in money)	7 (25.77)	consecutive losses (loss in money)	0 (-0.00)
	Maximal	consecutive profit (count of wins)	25.77 (7)	consecutive loss (count of losses)	-0.00 (0)
	Average	consecutive wins	7	consecutive losses	0

Figure 5.4. Portfolio balance at the end of the MACD Feasibility test

All the signals to enter the market have been proven correct by this model as shown in the report from above. This model deserves further testing, and using the conditions I described have a chance to be proven as a sustainable, low risk model to use for trading if certain conditions that require further investigation can be met.

5.3 Short Feasibility study for Price Action Trading

The most fundamental and widely used by most Fund Managers albeit in banks, private business or governmental sectors TA composition of indicators are called as "Price Action", and is the most mainstream and widely accepted form of day trading without the use of algorithmic trading. This set of indicators combined has become the core work tool for short term Day Traders, also called "scalpers" in the industry, to manage risk and seek maximum beneficial entry points in the FX Market, on very small timeframes. I will assess the efficiency of this method during this chapter, by looking on how well the following indicators that are part of Price Action Trading relate to each other. First, I will list the items I will be following on a Day Trading routine:

1) Twice as big wig than candlestick shows a price swing and suggests an entry point.

2) If a price is reached by a wig twice on either 1M, 5M or 15M it suggests a resistance or support depending on the nature of the candlestick

3) If there is a connection between the general trend and at least 2 wigs in the 1M, 5M or 15M it suggests an entry point.

4) Moving averages are drawn just for orientation purposes, as an extra indicator to show if the price is mispriced (bellow or above the averages)

First decision is shown in Figure 5.5 and explained afterwards.

Figure 5.5. Snapshot taken a few minutes on a 5M chart after the entry point has been selected, marked by the green dotted line.

I have detected an entry point that is validated by all conditions, on EURUSD at 17th June 16:10 on par value 1.12669 with Buy entry, since all conditions are met. Condition 1 highlighted with a red circle, entry condition 3 by the brown circles.

Pair value according to condition 4 was underpriced and expected to bounce back, therefore position was opened without a Stop Loss, and it will be monitored in real time for the duration of the day.

On 17th June 16:46, EURUSD chart shows the price moving during this time in a sharp decline as shown the Figure 5.6.

Figure 5.6. A very sharp drop in EURUSD which does not match the expected pattern of any of the Indicators that were selected for this test.

As it is visible in the graph by many adjacent green candlesticks on the right side, there has been a fast down trend unexpected and unconnected with any of the Technical Analysis indicators that were mentioned so far.. 370 Pips were lost in 30 minutes, enough to trigger most Stop Losses of even the most unconventional Day Traders.

Figure 5.7. Visual Indicators were switched from 5M candlesticks to 15M for getting a look at the general trend of the day. This enabled me to spot a Strong Support Indicator which I hope it will hold.

In an attempt to explain with Technical Analysis terms on why such a drop in pair price happened, I had a look at 15M candlesticks. A series of candles closing at the same price level showed up at the start of 17th of June (Figure 5.7). I believed and put my portfolio further at risk that the price will bounce off the Strong Support Indicator and go back to meet average lines and return some of his losses.

The standard interpretation for this this is that the price is closing in on an older strong support line, which is identifiable by more than 4 candles which are closing they bodies at a very close price to one another, both up and down candles. This information is meaningful to a Day Trader, as this is normally a stimuli to draw a straight line, and expect that such a situation will reoccur in the future. Since the strong fall of the price, the reoccurrence happened just a few days later and gave me the opportunity to test this theory. I took the educated assumption that the price will bounce off the Strong Support Indicator and go back to meet average lines and return some of his losses, therefore I committed to it by opening a new Buy position at this level, hoping that, this time, the price will really move up.

On 17th of June, 17:17 the trend started bouncing "Up" off the Support Resistance as shown in Figure 5.8.

Figure 5.8. The Strong Support Indicator holds, the trend seems to be backing upwards. New Buy position opened, which is marked by the green dotted line.

According to Technical Analysis this confirms the existence of the heavy support line which I marked in red on the graph above, and the trend bounced back up, recovering some of my losses. Since the support line holds, I decided on buying long and open at Buy price 1.12349, as shown in the graph above with the dotted green line, for a chance at recovering losses faster and even making profit, by going against my initial trade. I have also invested time trying to determine if there is an economics related action at play in the news that led to the abrupt down trend between USD and EUR currencies. No correlation that would imply causation was found, which deepens further my belief that the FX Market is very unpredictable, and working overtime does not imply higher gains.

On 17th June at 7PM, I noticed that the Strong Support line still holds and that the trend started to bounce back as dramatically as it came down. Such a situation usually brings into question if Fibonacci retracement can be used, to understand how hard the trend will continue to bounce back upwards (Figure 5.9).

Figure 5.9. Price is moving in my favor with 2 open Buy trades on EURUSD. With Gold color, Fibonacci retracement ratios have been drawn in order to decide on a closing price.

The Fibonacci analysis together with moving averages, support lines and candlestick patterns gave me the information that around this mark I can close my trades, as there is no Technical Analysis indicator that shows the price will go higher. At this point, the currency pair is slightly overpriced. Henceforth decided to close both Buy positions at the same time.

Table 5.10. The results of the Portfolio of the Live Price Action trades:

Open Time	Type	Price	Close Time	Price	Pips
2015.06.17 16:59:46	buy	1.12669	2015.06.17 20:03:46	1.12595	-74
2015.06.17 17:53:19	buy	1.12349	2015.06.17 20:04:24	1.12617	268

The result from the above table (Table 5.10) is an extract from the Portfolio, and the total Profit is 194 Pips, which is quite a significant profitable trade for a day's worth. Althought my initial TA strategy of entry point turned out to be a big mistake, I reacted fast by employing more advanced technical analytics by drawing in a resistance line based on the historical price, risking my portfolio on the hope that the resistance will hold and it did. Then I lastly used Fibonnacci retracement to decide on an "artistic" exit point, and according to theory that is arround the Fibonnacci 38.2 ratio. Here is where I closed both trades and calculated my profit or loss. All the Indicators described in the theory section of the previous chapter were used for the Price Action Live usability test.

To summarize all the moves behind the Price Action Feasibility test and its related Indicators:

The first Indicators I used was a candlestick pattern on 5M chart together with certain conditions that I described during the run and the fact that according to the 5M, 15M and 30M moving averages the pair price looked undervaluated. However, the market proved me wrong by moving in the opposite direction. To react to this I switched the view to 15M from 5M in order to get the perspective on the entire day, and I spotted there four candlesticks which had closing price close to the same level that suggests a Strong Resistance for a Day Trader. From noticing this I decided to be patient and wait for the price to reach the resistance line (Figure 5.7) and only close the trade if it breaks. Luckly enough the resistance line hold, therefore I got confident and opened a 2nd Buy right after the price movement started bouncing above it which ended up generating a lot of profit, while the previous Buy trade was also recovering from its downfall. Fibonnaci retracements were used according to the theory behind it, in order to predict a fair closing price, which would be where I closed both transactions and calculated profits.

The results can be interpreted multiple ways, however I strongly suggest to take into account that the most important interpretation should be based on Critical Thinking. There is no direct causation between the gains of the Portfolio, the trend of the market, and the analytics which were used. Simple correlation should not imply causation, and this has to be taken into account as a primary way of thinking before any speculation is made.

7. Recommendation that researcher puts forward for CFOs and Fund Managers

The results of the Technical Analysis simulation runs on EURUSD using Moving Average, MACD, Fibonnaci, support and resistance, candlestick Price Action indicators combined with the conclusions from analyzing how political factors can easily influence the FX Market and create volatile conditions and the fact that somethimes, sporadicly as demonstrated through the Price Action currency pair direction change that was triggered irregardless of what Technical Indicators were suggesting, can be interpreted to show that the FX Market is too volatile in nature in order to create sustainable gains. Volatility in the market is the main problem that Fund Managers and CFOs have to face, and has been something omnipresent throughout my investigations.

For CFOs, I recommend to only convert currencies when the market is stable. There must be an active lookout from behalf of the CFO for possible upcoming news that can throw the market in the wrong direction, and technical analysis can to some degree of success be used to decide upon the entry point of doing the conversion by at very least looking at historical price chart. A 2nd recommandation is to develop hedging strategies that can survive violent currency swings, as it is becoming very common today than it was before to see sharp swings of the market in one direction, perhaps due to how efficiently news travel now and herd behaviour.

For Fund Managers, who mainly look into making profit by speculating the market, Fundamental analysis must be used as defining a strategy for mid to long term trading. For Day Trading, a keen lookout on the main news channels and feeds that impact the currencies being speculated is of high importance. Day Trading is an activity that relies mostly on Technical Analysis, and for that success can only come if the FX Market is moving in waves. However this has not been proven in this research paper and also neither has it been proven in any other research paper on FX Market that is publicly available so far and not under heavy scrutinity. Examples of such scientific papers have been shown in chapter 4. Day Trading success is up to speculation and perhaps up to how smart the Day Trader is, in minimizing his risks and how well he understands the currency pairs and the factors which trigger movement, best would be to combine at very least TA's resistance levels Indicators and a keen eye for fundamental factors, such as economical or political that impact the currency pairs he is speculating.

To certain degree Technical Analysis has been demonstrated as a possibility to spend a lot of time into trying to understand if a wave has been spotted in the currency pair volatility. My belief and the results of my research suggest that this is wishfull thinking, subject to further research and unless a mathematical model can be found to predict to certain degree of success on many Monte Carlo type of simulation runs, Day Trading is an activity that is based on wishful thinking and success can most plauzibily be described as based on luck and a strong sense for minimizing risk.

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