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A CRITICAL ANALYSIS OF A TRADING STRATEGY ON THE CAPITAL MARKET

KRITICKÁ ANALÝZA OBCHODNÍCH STRATEGIÍ NA KAPITÁLOVÝCH TRŽÍCH

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Problem analysis and current situation
Proposals and contribution of suggested solutions
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Abstract

The thesis focuses on the definition of theoretical and practical nature of intraday trading. That is, technical analysis tools, development of trading systems, selection of broker and application of software support and knowledge to trade in futures markets with emphasis on the underlying instrument - Indexes. As a very important part of intraday trading is also discussed the psychology of trading, which despite its apparent irrelevance is one of the most important aspect of profitable trading in real markets, together with good money and risk management.. Based on research it is developed and in this work presented the intraday trading system, designed for profitable trading on stock markets – Indices, and the results and experience with its deployment in real world markets.

Abstrakt

Diplomová práce se zaměřuje na vymezení teoretické a praktické podstaty intradenního obchodování. To jest použití nástrojů technické analýzy, představení obchodních systémů, výběr brokera a aplikace poznatků a softwarové podpory při uskutečňování obchodů na termínových trzích s důrazem na podkladový nástroj – indexy. Jako o velice důležité součásti intradenního obchodování je také pojednáno o psychologii tradingu, která navzdory své zdánlivé nepodstatnosti je jednou z nejdůležitějších aspektů ziskového obchodování na reálných trzích současně s kvalitním money managementem a řízením rizika. Na základě výzkumu je vytvořen a v této práci prezentován intradenní obchodní systém určen pro ziskové obchodování na burzovních trzích – indexech, a výsledky a zkušenosti s jeho reálným nasazením na světových trzích.

Keywords

Intraday trading, trading, stock exchange, technical analysis, e-mini, futures

Klíčová slova

Intradenní obchodování, trading, burza, technická analýza, e-mini, komodity

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Statutory declaration

I hereby declare that this master thesis has been written by myself without any external unauthorised help, that it has been neither presented to any institution for evaluation nor previously published. All used information sources are properly cited including complete reference to the original work.

Brno, 30 August 2012

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Signature

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Introduction

Topic of intraday trading is very popular in US and starting to be in Czech Republic too. The number of information about this industry is increasing, but the quality sources are rare. This work could be one of them. The exceptionality can be found in real trading experience and not only theoretical facet.

Trading has to be dealt with like a real business not gambling. It is ordinary type of business and it has to be treated as such from the beginning. There are many various ways how to invest money on the markets. From forex, futures, to stocks, options and spreads. The differences are mainly only time and money you are able to offer. In this work we deal with intraday trading, the most risky type.

In the first part the work will be focused on theoretical aspects such as: types of futures, technical analyses, money management and psychology of trading. These theoretical recourses will provide background for the analytical part, which deals with developing of trading system, backtesting and subsequent live trading. Furthermore existing results are developed in series of conclusion and recommendation. The trading system was developed on the basics of an existing one. Still the statistical testing was very challenging. The live trading is a stand-alone chapter, which can serve as an instruction for future traders. Live experience is very valuable and beginners can take lessons to avoid expensive mistakes. The work shows what direction to start and what better to avoid.

1 Executive summary

Critical analysis of selected strategies of intraday trading (equity indices) using technical analysis to create a profitable trading system and its subsequent use in practice to verify the profitability in terms of real markets.

Methods used for reaching this goal are statistical calculation and tests to determine what is the probability of profit and the win ratio. Following the distribution function of profits and losses that are displayed in an equity curve. And finally the use of the developed and properly tested system in real markets. Many variants and settings are tested. This is possible due to a good theoretical background which is provided. The following live long lasting test provides sufficient testifying value about the whole problem. Results are properly evaluated and suitable proposals offered. Because of this test important facts were discovered that strongly influence any other research and development.

2 Theoretical basis of the work

2.1 Futures

2.1.1 Financial derivatives

Financial futures

There has been a big expansion in trading these products in last 30 years. Thanks to its sharp development, derivatives can trade also small investor not only big institutional traders. Advantages of these instruments are for instance: *investment opportunities, huge liquidity and low cost.*

Financial futures are quite young instrument which expanded in 70.'s and 80.'s. This was caused by turbulences and increased volatility on financial markets. Sharp price moves of stocks caused establishing of new financial instruments and their main goal was to save the investors against risk. So first financial derivatives came, which are also based on underlying assets just like commodity futures. In case of financial derivatives this assets are financial instruments and their offer is very wide. The basic underlying assets by financial futures are: *stock indexes, bonds, currencies.* Price of the financial derivatives is based on the price of the underlying assets.

The most popular are futures contract on stock indexes. Assets in this case are stock indexes, that express a value of some defined basket of stocks. If the price of the stock index changes the price of the derivatives changes too. Among the most popular and traded indexes are: S&P 500 (USA), Nasdaq 100 (USA), Dow Jones Industrial (USA), Russell 2000 (USA), DAX (Germany), DJ Euro Stoxx 50 (Eurozone), Nikkei 225 (Japan).

It is typical for derivatives to use a financial leverage when investor doesn't pay for the contract the full amount but only a deposit called margin. The same is with futures on stock indexes. Among smaller investors are very favourite so called mini contracts on stock indexes which demand only smaller deposit of cash. These instrument stand for simple fast and effective way how to trade on worlds stock markets. Advantages of these instruments: ability to speculate on the price development of the whole stock market, high liquidity and small spreads, possibility to earn on rising but also sinking

markets, high leverage effect, small capital requirements. Liquidity is guaranteed, therefore investor is not worried about high spreads and can trade even on one minute timeframe. There is a high daily profit potential when compared to other forms of investment. High possibility of profit equals to corresponding risk.

When trading futures on stocks index, technical analysis is used for positions entries and exits. Contracts are mostly traded on American CME Group, Eurex and Liffe-Euronext. (ČERMÁK, 2009)

E-mini S&P 500 – the most traded, in trading platforms can be found shortened as ES. Prices are counted according to the S&P 500. It is counted out of prices of 500 stocks of biggest companies traded in USA on the New York Stock Exchange. The value of a full point of the market ES is 50 USD, the smallest move of the market (one tick) is 0,25 points that represents the value of 12,50 USD. It is the most expensive one of four US stock indexes. The market is characterized by huge liquidity and it is no problem to trade tens or even hundreds of contract in one time. Therefore ES attracts usually professional traders with big accounts.

E-mini Russell 2000 (known as TF). Built on stock index Russell 2000 which is based on 2000 shares of smaller companies. Value of the full point of TF is 100 USD, the smallest move of the market is 0,10 points which represents value of 10 USD. Among the main indexes TF is the most volatile and active suitable for traders that can gain from bigger moves. The market is traded on the ICE exchange. (NESNÍDAL, a další, 2009)

Trading

Trading is a zero sum game. If one trader profits the other one has to lose.”People trade because they obtain external benefits from trading. These benefits include expected returns from holding securities, risk reduction from holding correlated assets and gambling entertainment. Winning traders trade for profit. Utilitarian traders trade because their external benefits of trading are greater than their losses. Futile traders expect to profit but for variety of reasons their expectations are not realized. Winning

traders make prices efficient and provide most liquidity. Utilitarian and futile traders effectively underwrite the winning traders efforts.” (HARRIS, 1993)

2.2 Trading approach

The name - speculator includes all subjects that buy and sell financial instruments to gain some profit. It can be large companies (funds) or small private traders.

There are two approaches how to look on the market:

- *Fundamental analysis*
- *Technical analysis*

Fundamental traders decide on supply and demand of the given commodity. They study resources, weather but mainly financial and political news and information. Fundamental trading demands deep knowledge of given commodity, therefore trader is focused only on few commodities.

Most of the small traders are technically oriented. The decisions come from technical analysis of graphs and charts. Technical traders look for various formations, work with indicators, mathematical formulas or they react to the crowd behaviour. These traders do not need to know details about the commodity, only actual price graph. Some traders naturally combine both approaches – the basic analyses is based on technical approach that is if needed combined with detailed fundamental aspects.

Simply, there are two ways of trading:

- *Position*
- *Intraday*

Position trader is everyone who holds the open positions more than 1 day. Position trader can hold his positions for days, weeks, or even years. He can also trade season

trades based on season cycles. Trader usually works with daily and weekly charts (graphs).

Intraday trader is everyone who trades during the day and holds his positions only a few minutes, maximally hours, but never over night. Intraday trader works with 1,2,3,5, 15 and 30 minutes timeframe with minimal interest about weekly and monthly charts. Each of these trading approaches can use different strategies, or at least different nuances. Some position strategies will not work for intraday trading and vice versa. Every way of trading is suitable for different personal characteristics. Intraday trading is more suitable for less patient people but position trading is suitable for really very patient individuals who do not mind their positions opened for days or weeks with no strong direction.

Another aspect is time – when the position trader is sufficient with one hour a day or at least few hours a week to analyse and plan the trades, the intraday trader has to be tied up in front of the computer few hours every day.

Position trading advantages: time consumption, less stress, huge profit potential, graphs and data usually for free, sufficient time for deciding over trade. Disadvantages: the market can move only sideways for a long time, holding positions over night is more risky, because many unexpected events can happen (reports) that influence the price next day. Higher commissions, higher margins, less opportunities to trade.

Intraday advantages: every day starting with blank sheet, smaller commissions, smaller margins (about 75%), possibility to make hundreds in few minutes, not holding position overnight, smaller risk – smaller stoplosses.

Disadvantages: time requiring, only through online trading, intraday real-time data and graphs has to be paid, almost no time for decisions which are made in seconds. (FINANCNIK, 2004)

Winning trading

“Skilled traders generally can profit when they have access to information of one kind or another. Value motivated traders access the entire stock of fundamental information. Informed traders have first access to news events which change the stock of fundamental information. Market-makers have access to order flow. Upstairs traders have access to latent trading demands. Bluffers create and access their own information. Prices are made efficient primarily by the winning traders. Value-motivated traders set fundamental price levels and maintain cross-sectional relation based on value fundamentals among asset classes and individual securities. Informed traders update prices to reflect new information. Technical traders ensure that no predictable components in returns exist. Arbitrageurs ensure that common risks have common prices. Liquidity also is supplied primarily by winning traders. Value-motivated traders are the ultimate source of depth and resiliency. Upstairs traders provide depth and organise liquidity for large traders. Market-makers provide immediacy by connecting liquidity demands through time. Arbitrageurs connect liquidity demands across space.

The winning traders can only profit to the extent that the other traders are willing to lose. Traders are willing to lose when they obtain external benefits from trading. The most important external benefits are expected returns from holding risky securities that represent deferred consumption. Hedging and gambling provide other external benefits. Markets would not exist without utilitarian traders. Their trading losses fund the winning traders who make prices efficient and provide liquidity.” (HARRIS, 1993)

2.3 Price action and TA

2.3.1 Basic formations in graphs

Triangle

Triangle is a price thickened area, which upper and lower boundaries go together on the right side. It can serve as a sign of trend reversal but more often as a sign of continuation. Small triangle, compared to the previous trend signs rather continuation. Big triangles can be considered more like signal of reverse. Some of triangles become choppy market. Uptrends and downtrends are crossed with triangles. The symmetric triangle reflects the balance of strengths between bulls and bears and works more as trend continuation. With the increasing age of the triangle the volume of trades decreases. If the volume of trades significantly increases in direction to the upper line of the triangle, probably there will be breakout from the top. The breakout has to be supported with a massive increase of volume to be valid.

Rules for triangles: It is better not to trade small price swings inside the triangle. The swings are getting narrow and so the profit potential is decreasing while slippage and commission is still there.

When making trading decision based on triangle – up or down - it can be important to look at the weakly chart to search signs of trends and in that case trade into this direction. If trader wants to buy breakout up, then it is handy to place buying order few ticks over the upper border of the triangle. As soon as the trade is filled it is needed to place the SL inside the triangle because the prices can do the pullback inside the triangle. But usually not very deeply. (ELDER, 2006)

2.3.2 Candle bar chart

Round year 1700 in Japan was developed a unique method of chart analysis. It was developed by Munehisa Homma. Candlestick charts belong to the oldest and frequently

used graphs. Many traders like it for its simplicity, clarity and possibility of using various technical formations and patterns.

- *Open* – opening value in given timeframe
- *Close* – closing value in given timeframe
- *High* – highest value
- *Low* – lowest value



Chart 1-Candlebar chart (created by author)

Candlestick or bar chart do not show the exact development in the timeframe. For deeper analysis it is suitable to use smaller timeframes. The uniqueness of candlebars is in its graphical expression. This gives the technical analysis the feel of plasticity- the orientation becomes easier. Also a Doji candle has to be mentioned which shows neutral behaviour. (MAŠLÁŇ, 2009)

Swing Highs and Lows

“Is price testing any areas of swing highs or lows? Of particular importance are those which lead to a change of trend definition; how is price reacting at those swing highs or lows?”

For an uptrend

Pullbacks to previous areas of swing low support should be watched closely. We expect them to hold. Is the price action showing signs of the level holding, or is it threatening to break? If it breaks, is price showing signs of rejection (opposing orderflow / difficulty continuing) or is price accepting this new area?

Pullbacks to previous swing highs (within an uptrend) are not as critical, but should still be watched for their reaction. Extensions are expected to break the previous swing high. Is price action supporting that premise, or is the candle pattern showing weakness. If it can't exceed the previous swing high, we need to be alert for further signs of weakness which may forecast a complex correction or reversal.

For a downtrend

Pullbacks to previous areas of swing high resistance should be watched closely. We expect them to hold. Is the price action showing signs of the level holding, or is it threatening to break? If it breaks, is price showing signs of rejection (opposing orderflow / difficulty continuing) or is price accepting this new area?

Pullbacks to previous swing lows (within a downtrend) are not as critical, but should still be watched for their reaction. Extensions are expected to break the previous swing low. Is price action supporting that premise, or is the candle pattern showing weakness. If it can't break the previous swing low, we need to be alert for further signs of weakness which may forecast a complex correction or reversal.

For a sideways trend

- Is price testing a range boundary?
- Has the market shown strength or weakness on approach to the boundary? Is the current candle pattern sentiment continuing this strength or weakness, or has something changed?

- Is the pattern showing signs of orderflow opposing the move into the range boundary, such as tails rejecting price at or near the level?
- Has the pattern breached the area of range S/R? If so, is it now showing signs of acceptance or rejection of this new area? “ (BEGGS, 2012)

2.3.3 Indicators/Oscillators

Indicators can help us identify trends and the reversal points. They offer deeper look into bulls and bears power. But there is a problem with indicators that usually one denies another. Some of them work on trend markets, some of them on choppy markets. Some are built to catch the reversal point. It can be very tricky for beginners to be stocked in the indicator flood. Real traders need to know what indicators work best on what conditions. Before using any indicator, trader has to know what it measures and how it works. Only so you will have the confidence in its signals.

There are three groups of indicators:

- *Trendfollowing*
- *Oscillators*
- *Mixed*

Trendfollowing work best when markets are moving but give false signals on slow, choppy markets. Oscillators are great on non-trending markets, but give precipitate signals when new trend is developing. Mixed indicators offer special view in to the mass (crowd) psychology. For profitable trading it is suitable to combine few indicators from few groups, so the negative sides were eliminated and the positive stayed untouched. Trendfollowing include: moving average (MA), MACD (moving average convergence-divergence), Directional System, on-balance Volume, Accumulation-distribution and more. These are the same or delayed behind the trend and their development turns as soon as the trend changes.

Oscillators help to identify reversal points. Including Stochastic, Rate of Change, Smoothed Rate of Change, Momentum, RSI (Relative strength index), CCI Commodity Channel Index, Force index, William %R, etc. Oscillators go identically with trend or even before it. And their running often turns even before change of the price.

Mixed indicators allow to view in the intensity of the bulls and bears opinions on the markets. Include New high-new low index, Put-call ratio, Bullish Consensus, Commitments of traders, Advance /decline index, Trade's index, etc. They run together with trend or before it. (ELDER, 2006)

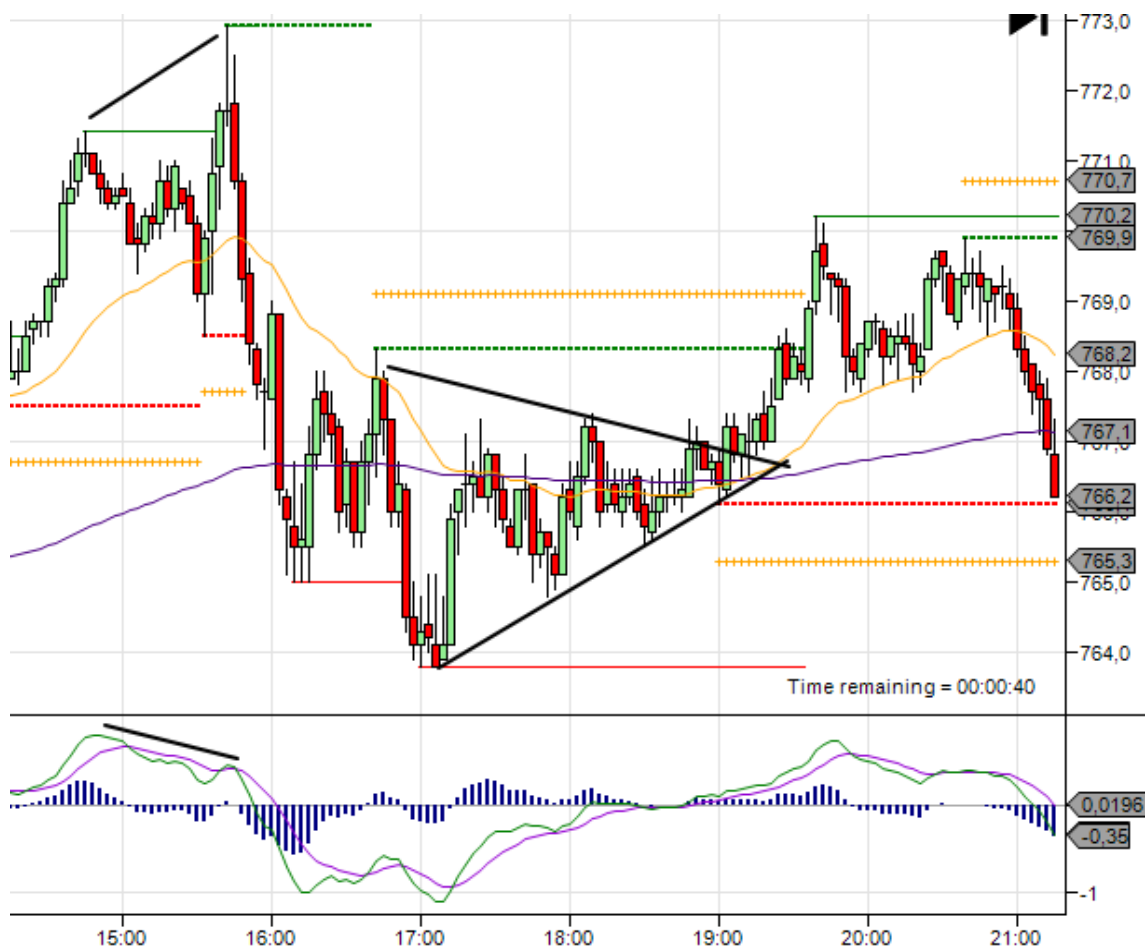


Chart 2- Demonstration of triangle, EMA, MACD-histogram and divergence (created by author)

2.3.4 EMAS – MACD – Divergence

Moving averages (EMA)

Moving average – MA shows average value of data in width of its time window. Five day MA shows the average value of last 5 days, twenty day MA of last 20 days etc. When the value of MA is connected we create a curve of moving average. The size of MA depends on two factors: values that are measured and the width of the time window in which we measure the MA.

Assume that we want to calculate three day simple MA of some stock. If in these days the stock closes on 19, 21 and 20, the simple MA of closing prices is $20 - (19+21+20)/3$. The fourth day the price closes on 22. The three day moving average rise to 21. It is the average of last 3 days $(21+20+22)/3$.

There are 3 main types of averages:

- *Simple*
- *Exponential*
- *Weightened*

Most of the traders use the simple **MA**. But it has one fatal lack. The MA changes when the old price is released from the time window. If the high price value disappears the MA sinks and if it is a low price, the MA rises. These movements have nothing to do with the reality of the Markets. The most important message that us MA gives is the direction of its slope. If it points up, it shows that the market crowd becomes more optimistic – bullish, but if it goes down, the crowd is still getting more pessimistic – bearish. If the crowd is more bullish than before, the prices rise over MA. But if the crowd is more bearish, prices sing under MA.

Exponential moving average (**EMA**) is a better instrument for watching trends than simple MA. It gives more weight to actual data and responds to the changes faster than simple MA.

Simultaneously EMA does not jump up and down depending on old data. EMA has two main advantages over the simple moving average. First, it assigns more weight to the most recent trading day. The actual mood of the crowd is the most important. Secondly, EMA does not exclude the old data at the end of its time window like the simple MA. The old data slowly dissolves. Relatively short EMA is more sensitive to price changes – it enables the trader to catch the trend sooner. Relatively long EMA is not so sensitive and does not register every small move, but main reversal points are displayed later.

Moving averages help us to trade in the direction of the trend. The most important message that is given to is results of the direction of its slope. It shows the direction of inertia of the market. If EMA rises, it is best to enter long positions. Buy if the prices penetrate near or slightly under the moving average. When in position, place the SL under the last next low and move to BE when prices close over its EMA. When the EMA curve is flat and turns only slightly, we deal with sideways choppy market. In this case it is not recommended to use methods suitable for watching trends.

The old mechanical trading methods based on MA crossovers worked only on trending markets. But when they create a pillow-shape when there is no trade, big losses appear. Even with various filters which not only reduce losses but the same amount of profits. MAs can also be used as zones of support and resistance. Rising MA creates bottom under the prices and sinking top over them. Therefore it is suitable to buy near rising MA and selling near sinking MA. MAs can be even applied on indicators. Some traders for instance use moving average of volume of trades. (ELDER, 2006)

MACD

MACD was developed by Gerald Appel, analyst from New York. Moving average convergence-divergence is built from 3 MAs. It appears on a graph in a form of two lines and their cross offers certain trading signal. The MACD curve is created by 2 EMAs and responds very quickly on changes. The signal curve is created by line MACD smoothened by another EMA which responds on changes bit slower. Signals for

buying and selling occur when the fast MACD curve crosses the signal curve from the top or bottom.

Every price reflects consensus over value among the crowd of the participants of the market in the moment of trade. Moving average represents an average consensus over value in chosen time frame. By crossing MACD and a signal curve the change in bulls and bears balance is identified. When the fast rises over the slow, it can be seen that the bulls are dominant and it is better to enter long positions and vice versa. Crossing of MACD lines identifies changes on the market. Trading into the direction of crossing means to flow with the market crowd.

MACD- Histogram

This indicator measures the difference between MACD curve and a signal curve. This difference is shown as histogram – a series of vertical lines. If the fast curve is over slow, histogram is positive and is drawn over the zero line. If the fast curve is under the slow, MACD-histogram is negative and is drawn under the zero line. When both curves touch each other the histogram equals zero.

The slope of the histogram is defined by the relationship among two neighbouring bars. We look for rising or declining slope. Slope of the MACD histogram identifies dominant group on the market. Rising histogram signs that bulls are getting stronger. If the fast curve of MACD rises faster than the slow one, the histogram rises too. That means that bulls are stronger than they used to be and that there is a good moment for entering long positions. If the slope of the MACD histogram develops in the same way like prices, the ongoing trend is safe. But if its slope is in opposite direction, the health of the trend can be doubtful. It is better to trade in the direction of the slope. The slope of MACD-histogram is more important than its position over or under the middle line. The best signal for selling is given in such moment when the histogram is over the middle line, but its slope is declining. That means that the bulls are getting tired. Histogram can help traders to view the path in front of them. New highs and lows in the indicator are usually followed by new highs and lows in the price development. (ELDER, 2006)

New top values in last few days sign, that bulls are very strong and the prices will apparently continue to grow. If histogram reaches a new high, the uptrend is healthy and we can expect new price growth. Histogram confirms new trend when reaches new highs or lows in harmony with prices.

Divergence

Divergence between MACD-histogram and prices identifies main points of reverse. These signals occur only rarely, but when that happens, it often enables the trader to catch the main reverses or the beginnings of new trends. It is one of the strongest signals in technical analyses. They do not occur at every important top or bottom, but when you see divergence it has to be considered that the reverse point is near.

When prices rise to higher high, but MACD histogram creates lower top it is the bearish divergence. The lower point of MACD histogram shows that bulls are weak in the inside, however the prices still rise. When bulls can not the bears are ready to take control. The bearish divergence between MACD histogram and prices identifies a weakness of price tops of the market. It gives a signal to sell just in time when most of the traders enthusiastically expect new high. If the divergence is fake and new highs are reached the traders are out of the trade on SL. In this case it is good to watch the histogram carefully. If it diverges again we have so called triple divergence which is really very strong signal. Histogram works on every timeframe: weekly, daily, and intraday. Only signals in longer timeframes lead to bigger price changes. (ELDER, 2006)

Downtrend – From the Perspective of Supply & Demand and Trader Decisions

“An area of trend resistance has formed as traders, for whatever reason, have determined that the swing high is overvalued. New short positions are established and bearish sentiment results in falling prices. A downwards extension develops due to bearish pressure overcoming bullish pressure. Traders continue making selling

decisions and are willing to continue selling at lower prices in order to get into this market, pushing price to new lows. At some point, short-term shorts will take profits and new longs will be attracted to the market by lower prices. This increase in bullish pressure will overcome the bearish pressure and form a bottoming pattern; an area of trend support forming as a swing low. The rally from the swing low attracts more bullish orderflow, as more shorts will take profits (having recognized the swing low support) and more longs are attracted to the market. The price pullback involves bullish pressure temporarily overcoming the bearish pressure to drive price upwards. Traders are making buying decisions and are willing to continue buying at higher prices in order to get their order filled.

This is not necessarily an indication of a trend reversal. The higher prices that occur as a result of the bullish sentiment are unable to attract sufficient bullish orderflow to break the previous swing high and result in a trend reversal. Rather, these higher prices attract more selling, sufficient to match the bullish orderflow and halt the pullback. Sentiment changes again to bearish as more selling is attracted and as longs cover their position, recognizing that the upwards price swing is simply a pullback and not a reversal. A new area of trend resistance forms, as a lower swing high. Bearish sentiment again leads to price falling below this swing high and the process repeats.

Interestingly, the bearish pressure within a downtrend is not just from new selling decisions. Remember, each transaction involves both a buy and a sell. Price movement is a result of the net trading decisions of all traders, and the urgency with which one side is more desperate to transact than the other side. Much of the bearish pressure within a downtrend comes from longs (who tried to pick the reversal) exiting out of their losing positions.

Consider the psychology and thought processes of the majority of traders (those who consistently lose). Having failed to catch the downtrend and now seeing falling prices, these traders are consumed by negative thoughts and emotions – regret, anger and ultimately revenge. Knowing a price swing can't go on forever they enter long at the first sign of stall or potential support, hoping to gain an early entry into the trend reversal. Usually they're wrong. Even if they're right and have managed to time an entry at or near a swing low, it's usually only temporary as the upswing proves to be a

pullback within the continuing downtrend rather than a trend reversal. Our emotionally influenced trader is then forced to exit their long position (sell order) as their stops are hit; contributing once again to their net loss situation through another poorly managed losing trade. A significant portion of the bearish pressure within a downtrend is the losing long exiting their position (via a sell order). In many respects, the downtrend is fuelled by the losers on the bullish side.

Sideways Trend - Definition

A sideways trend comprises a series of price swings existing within the range of a significant upper resistance area and a significant lower support area. The range support and resistance boundaries (range lower and upper boundaries) may be formed from either higher timeframe S/R and/or significant trading timeframe swing highs or lows.” (BEGGS, 2012)

2.3.5 Pin bar, inside bar

Pin bar

Pinbars are almost the same like more known formations hammer and a shooting star. These occur after long bullish uptrend and indicate possible reverse - that there are not any more buyers. A candle like this has a long upper wick, and the open and close of the candle is in a close position and in the bottom part of the body. How can these formations be used in trading? It is not good to trade only these formations but in combination with any other trend reversal indications can be very strong. For instance when formation like this occurs on any important S/R level gives much more edge than standing alone. (URBAN, 2010)



Chart 3- Pinbar (created by author)

Supporting factors can be following

S/R levels, retracement levels, trendlines, psychologically important numbers (820,745,900), moving averages, long nose of the pinbar. This formation can be used at all timeframes, but on higher timeframes works more reliably (at least 1 hour timeframe).

Inside bar

Trading inside bar has almost the same logic like trading pinbars. So many characters are similar. And we can use the earlier mentioned advice for this setup too. The formation inside bar is created when the high and the low of the current candle is located inside the previous candle. Similar to “doji” candle it also shows the uncertainty of the traders. This also can be understood as the unwillingness to reach higher highs.

Therefore inside bar can predict a reverse to lower values. Inside bars can be traded at any timeframe, but the usual rule has to be noticed that shorter timeframes offer more often opportunities, but these are not so strong and more risky than at higher timeframes. Pinbars are suitable for trading with stop orders – on side of the candle is the stop order the other side is SL.

There can also be found inside bar which is already in another inside bar. Those setups are especially strong. If the inside bar is created very near to a S/R level it is suitable to place the order over/under the S/R level to eliminate false breakouts. Because the price can stop at the near S/R level. Similar to pinbars, also inside bars cannot be traded “standing alone”. Further supporting factors (context) is needed while trade execution. Those can be primarily strong S/R levels, moving averages, trendlines, round numbers etc. Inside bars on higher timeframes (4H or daily) are quite successful. However on shorter timeframes often appear failure breakouts which end on stoploss. (URBAN, 2010)

2.3.6 Support/ resistance

The ball falls on the floor and bounces back. Than it falls again after hitting the ceiling. Support and resistance are like floor and ceiling which pulls prices between them. Understanding support and resistance is crucial for understanding price trends and formations. Support pulls the prices from the bottom and resistance from top. It is better to draw the S/R trendlines as a connection of many similar price levels. These price levels show the places where many traders changed their mind. On the other hand extremes show only the panic and thoughts of the weakest traders. Weaker SR levels only stop the price but the stronger levels reverse the trends.

S/R exist because traders remember them. Our thoughts encourage us to buy or to sell at certain price levels. Buying and selling of the mass of the traders creates support and resistance. If the traders remember that the prices recently stopped sinking and from certain level started rising again, they will probably buy as soon as the price reaches that level again. If the traders remember that the uptrend recently reversed after hitting certain top, they will sell short as soon as the prices reaches near that top again.

For instance the most of the price rises were stopped at the moment when Dow Jones industrial Average rose to 950 or 1000 points. This resistance was so strong that it has its own name when the bulls were able to push the price through the level it became very strong support. Support and resistance also exist that masses of traders feel pain and disappointment. Traders who hold loss positions or traders who missed the opportunity are disappointed and also wait that they get a second chance. Feelings of pain and disappointment are mild when the market does not trend and the movements are smaller, because they are not hurt so much. Breakout and establishing of a new trend brings intensive pain and disappointment.

When the market is flat, the traders buy at the bottom edge of the trading range and short at its upper edge. In uptrend bears feel pain and bulls regret that they did not buy more. Both groups are decided that that they buy if the market gives them second opportunity. Pain of bears and disappointment of bulls leading to resolve the situation (buying) creates support. The strength of support and resistance depends on the strength of feelings among the masses of traders. Further the prices stay in the congestion area the stronger the emotional commitment of bulls and bears is. If the prices approach this area from above, it serves as a support. If the prices rose from below, it serves as resistance. That means the congestion area (CG) can serves as support and also resistance. (ELDER, 2006)

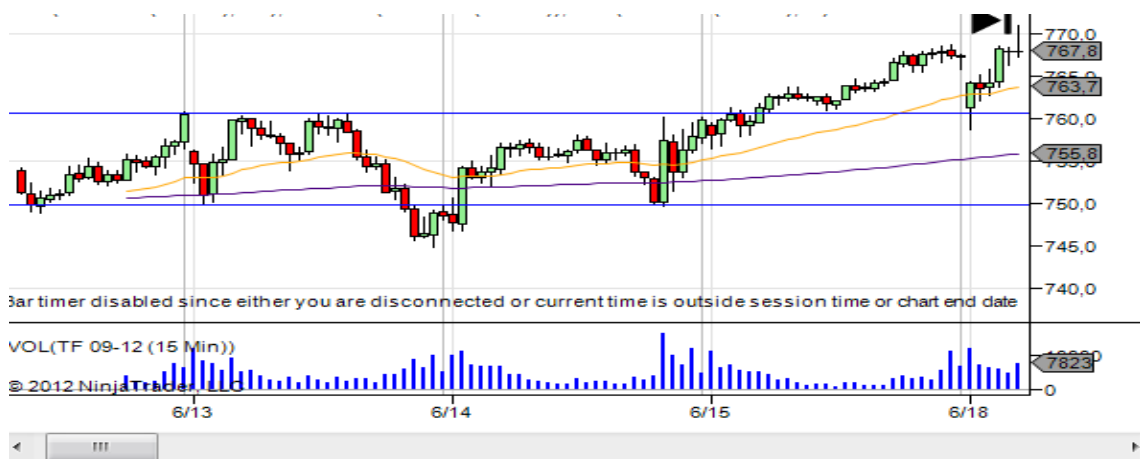


Chart 4- S/R levels and volume (created by author)

The strength of S/R zone depends on 3 factors: on its length, height and the volume of trades, which took place in it. Further the area of S/R is the stronger it becomes. In the chart of 2 week trading we can find only few S/R levels. The 2 month chart creates medium S/R and the 2 year graph reveals strong support and resistance.

As the lines of S/R are getting old they gradually weaken. The losers are replaced by new traders, who do not have the same emotional engagement to old price levels. People who lost money, after certain time only rarely remember their previous losses. Those who have made bad decisions few years ago are probably out of the market now, therefore those memories cannot influence the market. The strength of S/R rises when the prices hit them again. When the traders see, that the prices repulsed from certain level, the traders seem to believe, that the prices will repulse from the same level again in the future.

Recommended rules for S/R trading

Anytime the trader is in position near support or resistance, he should tighten the stoploss. The strength and health of the trend belongs to its behaviour when it hits the S/R. When the trend is strong enough to break through that area on continued, its power is increasing and the tight SL is not hit. But when it bounces off the S/R and the trend is weakened and then reversed the tight SL can save a big portion of profits. S/R are more important by long-term trading rather than short-term. Weekly graphs are more important than daily. It is useful to check more timeframes at one time and subordinate in accordance to the longer timeframe.

The markets are more often non-trending than trending. So, many breakouts in the markets are fake. The fake breakout is hated by amateurs but loved by professionals. Pro traders expect prices to fluctuate most of the time around some value. They wait till prices after breakout up stop creating new highs. Then they attack – they trade against the breakout and place the SL on the last extreme value. The SL is very tight therefore the risk is minimal in opposite of big potential. The RRR is so favourable that they can be half wrong and still make money.

The real breakouts are confirmed by big volume of trades, meanwhile the fake ones are accompanied by low trade volume. The fake breakouts come usually with divergence between the price action and indicators. (ELDER, 2006)

2.3.7 Volume

Volume (often VOL, Volume of trades), is an indicator that shows overall number of contracts traded in a specific timeframe (minute, hour, day, month and etc.). In other words, volume tells us, how much people traded in given moment. High value means many trades in a specific time period and vice versa.

If there is a daily VOL 1000 - in the given day there was traded 1000 contracts of given market short or long side. Volume can be interpreted in forms of numbers or also various graphs. High volume of trades are usually in trading days that are influenced by some important fundamental news. If there is an important information among traders most of them start to react by closing current positions or opening new ones and volume rises. Low volume can be seen in days when the market is calm and sideways (choppy). But when prices break out of this range, the volume rises, because big amount of orders is placed over/under this trading range. For traders volume can also be useful to indentify liquidity of given market. If there are only a few hundreds of contracts traded in a day, that indicates non-liquid market and trader should stay away from those. In markets with small liquidity are problems with order filling and there is also a danger of limit moves.

It can be said that 10000 contracts per day is a decent liquid market. Some of the markets reach even volume of 100 000 contracts traded per one day. For intraday trading sufficient volume is highly recommended. Another possible use of volume indicator can be indication of the trend reversal. It is not a 100% way but volume can really sign this reverse, which is accompanied by extremely high volume. But for using this method in trading it is recommended to use it with combination with different indicators or technical signals.

Also a trader can be noticed by the volume indicator that volume in one contract month is sinking and it is the right time to move to the other month. (PODHAJSKÝ, 2005)

Market analysis

“Market Analysis should be practiced as much as possible. The practice never ends, as there is always more to learn. It’s a process of constant growth and personal development, as we gain more experience in reading the flow of the market through years and years of exposure. Experience leads to a better read and a more accurate assessment of likely future price direction. A more accurate assessment of likely future price direction leads to better identification of trade opportunity. Better identification of trade opportunity leads to greater profitability. Live trading provides us the opportunity to continually practice our analysis; and our market review sessions and simulator replays provide the opportunity to compare our performance with hindsight perfection. Replaying the patterns of market behaviour reinforces our intuitive ability to read and follow the flow of price.

However you don’t need to be trading live to benefit from this. Practice can be achieved right now through conducting live market analysis (with no expectation of trades). Just follow price action. Determine where it’s going next through applying your Initial Market Analysis process. Then adjust your expectation of future price action bar by bar as new candles appear on the right hand edge of your charts. Take some time out to practice. Just follow price action. Decide where you expect it to go from here; and adjust that through bar by bar ongoing analysis.

Once again, I would like to reiterate the importance of SIMPLICITY. Don’t make this more complicated than it needs to be. Just question each bar – does it support your initial assessment. If so, great! If however it does something unexpected, then decide whether to change your expectations for future price direction, or wait for more information. If you’re unsure, then just wait. Another candle will be along shortly.” (BEGGS, 2012)

2.4 Money management

MM – one of the most important aspects in trading – money flow, adequate risk and reward, percent win. MM- helps us to decide how much money we can risk and what size of risk is already unacceptable. In other words managing risk on one trade and managing capital. Trade management is absolutely the most important approach to trading. In practice it means that we cannot ever use our whole capital (or its inadequately large part) on one single trade. Many amateurs are able to “bet” 50% of their capital on one trade and believe that it goes well. Usually they lose half of their account on one trade.

- MM rules: Every trade has to be secured by stop loss. Only very small part of trader’s capital can be put in risk on each trade.
- MM can also be: trader has to be prepared for times when his performance will not be good. Trader shall not start trading more aggressive in bad times. There is no reason to hold positions on the same level when the account size goes up.

SL is a simple order by which we can define our maximum loss of our trade in advance. This order is placed in the market together with our entry order. We want to be sure that we will never be without stop loss (and face the unlimited loss). This order exits with prior defined mild loss when the market goes against us. Stop loss enables us to control the risk of the given trade. If the trade does not work, trader loses only a small part of his account – not more. Through SL we can plan our risk and put it under control. Professionals risk only 1-3% of their capital on one trade.

Tips: never risk more than 3% of account, define the risk using SL, never trade without SL, use markets that are suitable to traders account, do not trade when lack of capital. If there are more trades opened in one time do not expose more than 50% of account.

Managing capital also requires knowing basic statistics of our trading in order to be prepared for it. Those are maximal drawdown in tested time period, maximum number of loss trades in a row, maximum number of days/weeks. The plan should be built on

the worst scenarios and how to divide our capital according to it. It is also crucial to create some reserves to survive bad times. For instance, we want to use 150 USD stop loss on one trade. The worst scenario showed that we can count with 15 losing trades in a row. This represents the highest draw down in tested period – 2250. It is important to know how big drawdown is the trader willing to take. Most of the traders are about 20% of their capital. That means – if 20% is a loss of 2250 USD then 100% represents 11250 USD. Therefore the trader will not start trading with an account smaller than 11 250 USD. (FINANCNIK, 2004)

2.4.1 Risk reward ratio

Successful trader can risk only in situations that can bring adequate profit. Ratio between risk and potential reward. This ratio is next of the basic aspect of money-management which has to be applied into trading strategies with highest importance. In trading, if we risk our money we want to see a profit potential greater than the risk. Technical analysis can answer the question regarding reward. It can be in boundaries of nearest SR levels or High/Low of the current day. It is not an almighty technique but, it helps us to filter trades which do not have a sense. Risk-reward-ratio should be always on the traders mind. He should never be settled for a POTENTIAL reward which is 2-3 times greater than the risk. If traders stick to this rule, they will not have to execute so many successful trades, but they will still be able to earn very well.

RRR depends also on win percentage of given trading system. It is logical, that if you trade with win ratio of 60% and more you can afford to trade for less profits. Traders can choose whether they want to have many smaller winning trades with some smaller losses or rather less often big profits with higher frequency of smaller losses. This can be managed by increasing/decreasing profit targets. This is one of the bit advantages of trading, every trader can choose appropriate trading style for his nature and personality. But of course it is hardly possible to have high winning ratio and meanwhile high RRR.

If traders want to have higher win % they can work with the RRR 1:1 – 1:1,5. Ratio of 60% winning trades can be reached. Smaller RRR and higher win % can help to even out the equity curve. It is not recommended for amateurs to use RRR smaller than 1:1. If trader decides to use smaller RRR, he will reach higher stability of profits – he wants to trade only for smaller profits which are in markets very often. But if trader wants to be the most profitable the best solution can be higher RRR. Then he has to deal with the possibility of much higher drawdown. (NESNÍDAL, a další, 2009)

2.4.2 Position sizing

Many traders are not aware of the fact that if they want to get to the BE of their account after a loss, they have to evaluate the rest of the money more in % than they originally lost. Simply, if a trader has an account with 10000 USD and loses 10% of it. The account would now have 9000 USD left. But to get back to zero (10000 USD) it is not enough to evaluate the 9000 account by 10%, but we need 11%. But when we lose 15% of capital we have to evaluate the rest by 18% to reach the BE. When losing 20%, we need evaluation of 25%, when losing 25% we need 33% etc. When we lose 50% of our capital, we need to evaluate rest of our account by 100% to get back to starting value. Therefore starting trader cannot trade too aggressively to lose a big part of the account and be out of business. Because it is very difficult to get back.

Methods of managing positions according to account enlargement is called position sizing. Traders will not keep trading only with one contract. This is suitable for novice to start with trading. Learn basic principles and get to know how markets work. But for serious trading for living is not one single contract enough. Therefore there are many mathematical models for effective position management. Usually based on a simple fact, adding positions when the performance is good and decreasing when it is poor. But the previously mentioned rule of 3% is actually a simple method of position sizing. Because when the trader's account grows, 3% represents bigger and bigger amount of money, therefore more contracts can be added.

If we start trading with the account of 10000 USD, our risk would be 5% on one trade and our stop loss would be 250 USD, we can start with 2 contracts. If we traded well we could add another contract when the account is 5000 USD more. When the account is evaluated to 50000 USD, we can trade with 10 contracts. As the account grows, so do our positions and the assessment of our account is getting quicker. Make 10 000 to 50 000 USD with one contract is very difficult. But to do the same goal with position sizing is much better choice (15000 USD 3 contracts, 20 000 USD 4 contracts, etc.).

Summary

Use stop loss. Traders without it will eventually lose a big part of their capital.
(NESNÍDAL, a další, 2009)

2.4.3 Risk management – MFE, MAE

- *MFE analysis* – maximum favourable excursion, maximum profit that could be reached. It's goal is searching optimal exits based on maximum profit of each trades most often reached. In backtesting we have to noticed what maximum amount of money would each trade make. This value is MFE. This analysis should be done at least on 100 trades. Than we find out what profit the market reached most often. The selected value should not be over-optimized – therefore values around it should give similar results.
- *MAE analysis* – maximum adverse excursion – maximum size of countermove. (open loss) Goal of this analysis is to find an “ideal” value for our stoploss.
(NESNÍDAL, a další, 2008)

2.4.4 Margin

Margin is an amount needed to trade one contract, this amount differs broker from broker. Every trader needs to have a sufficient account value to cover the size of the margin. Margin is divided into initialling, maintaining and overnight margin. (IB, 2012)

2.4.5 Slippage

Slippage can make big difference between backtesting and real trading. Slippage is simply a slip in price filling which is usually 1 tick but can be even more. This can significantly change the results. Many people do not count with slip when their SL was hit, but even at that point negative slip can occur.

2.4.6 Trading orders

The market order is one of the most frequently used orders. When using this order the price is not specified by the trader but the trade is open/closed as soon as possible with using the actual price of the market. So usually market orders are used for quick executions. The limit orders executes the position for given price (or better). Priority is not time but reached price which has to be the same or better as the price given in the order. Therefore the trader gets a planned fill however sometimes can occur that the market can “run away”. The price could be for a while on the given entry value but the exchange could not par the order because there were more in the queue. Limit order is often used for exiting the position – profit target. Buying limit orders has to be placed with a price which is the same or lower than the actual trading price. It is also obvious that the order doesn’t have to be filled at all. If the price doesn’t pull back, than there is no execution and we miss the trade.

Stop order is another frequently used order. Stop order is executed when the price hits it and then it changes to market type. Stop order is ideal when trader wants to enter

the position after breaking a support or resistance level. Stop order is suitable for so called stoploss orders. It closes the position when hit. (PODHAJSKÝ, 2005)

2.5 Trading platform

Trading platform that I use is called Ninja trader. This software deserves better name, because it is really well built. Most of all it is free for own use and provides features such as analysing all markets – futures, stocks, forex. It also has advanced multi-series charting with rich drawing tools and extensive indicator library and also the comfort ability of trading from the chart. Than the option of running historical tests and analyze the performance of automated trading strategies with high performance backtesting or walk forward and genetic optimization. (NINJATRADER, 2012)



Chart 5- Ninjatrader platform (created by author)

2.6 Psychology

At the beginning it is important to mention, that psychology is not everything, as usually stated. You can be 100% disciplined, but if your exits and entries are completely wrong, you will still lose money. Usually pro-traders say that psychology is 95% of their success, but that is because they consider their entries as something natural and well managed.

The main issue about trading psychology is fear and greed, but also frustration and euphoria. For people who have not tried trading it is hard to explain or to believe how difficult it is to stick to the plan when emotions are in the game. Unexpected emotions occur and unable us to perform what we wanted.

Especially when a trader thinks that he finally learned how to trade and thinks that he is a master of the world a blackout day can occur. Many traders have experienced that. Few months in a row you perform great, but one day you suddenly change it all. In order to reverse the first trade loss you start to trade emotionally, without any rules. Lose all your boundaries and do not stick to the basic trading rules, such as money management. As the loss goes deeper and deeper you start to adding contracts and the tragedy is getting bigger. Trading becomes gambling. You are swallowed in emotions and adrenalin. The traders head is just black out for a moment, after hours of this madness a trader can lose half of his trading account. These days really happen at 1 of 3 traders at the beginning of their career. It is important to experience this moment, learn from it, overcome it and never do it again. (STEENBARGER, 2011)

Although it is very important to be consistent, not panic and not fall into sceptics in time when we are not doing very well. Those times have all world traders, but discipline and restraint, the ability to deal with losses is necessary. Usually when the trading is stopped a new series of quite profitable trades occur. This would get the trader out of his DD but this already happens without him. This is one of the biggest and most common mistakes. Trader starts looking for a different system and is caught in never-ending circle in a search of Holy Grail.

The reason why it is so difficult to deal with losses can be that today's world almost does not allow to fail and we face the pressure to be perfect in every occasion. Therefore people logically think that failing and taking losses is something bad and socially unacceptable. But in the world of trading financial markets we have to forget the need to be perfect all the time and we have to accept the natural losses as something common, otherwise it would destroy us.

Second reason why it is for us so difficult to accept small losses can be natural patterns of behaviour that are in each of us from childhood. If we did something wrong we were punished. So it is natural for us not to make mistakes even subconsciously and we think that failing is unacceptable.

The pressure always to be perfect and not make errors in life from early childhood is so strong and noticeable that it is quite natural that people fail to deal with such things as repeated financial losses in commodity trading. And of course, face so tight patterns of behaviour and peer pressure is very difficult task. Therefore only a few traders who were able to get rid of fear of "making mistakes and losing money" paradoxically earn huge fortune. So it is needed to start work to be able to accept the fact that in trading – unlike the real world – there is no need to be always perfect in every respect you have a solid chance to succeed. "The road to richness is through an infinite number of small losses." (NESNÍDAL, 2004)

Tips

- Know yourself
- Each person is an individual, unique creature with number of mistakes and strengths
- If people learn to know themselves they will be able to realize own faults and strengths and accept them without fear or remorse. Then the trader has a solid chance to cope with psychological aspects of trading. Everything you learn about yourself and accept will help you to build your own individuality, confidence and other skills essential for successful trading
- Have a system you trust and with whom you identify

- Each potentially successful trader should choose a system that fits him. Every aspect of the system should correspond with trader's nature. It is not good to underestimate this critical moment. Try more systems. For someone it can be better to trade more aggressive intraday strategy, for different person long-term position strategy. It can be better system that produces many small gains and fewer losses, or system that produces a lot of small losses and a pair of huge profits
- Simply, the ideal system is not the one that never loses but it is the one you feel good about and suits well traders nature
- Paper training
- If the system is chosen and the trader thinks that it could fit his character, this system should be properly tested first. A huge advantage of commodity and stock trading is that people can try system first with hypothetical money. The strategy should be tested until it is completely sure that it has fulfilled traders' expectations. If trader has a real fitting strategy that is tested and the trader is happy with the results than he has much bigger faith in this strategy and it is easier to accept losses. (NESNÍDAL, 2004)

What professionals say about success in trading

“To try to put it as succinctly as possible, in my view traders that are focusing all their attention on "set-ups" and finding out which combinations of indicators work are never going to become profitable. They are trying to follow the advice of trading books that say trading is simple and psychology is everything. So they search for set-ups that "work" and that can take the guess work out of trading. They want to be "disciplined" and have simple rules that guide all their actions. But there are a few problems with this. Namely, while psychology is HUGE, it's not everything. And while trading is all about simple principles, actually having an edge is NOT simple. It's a myth that you can have a couple simple price or indicator set-ups and make money consistently if only you are disciplined. That's a load of crap. It keeps the dream alive for wannabe traders who never realize what it's truly about. Well let me tell you what it's truly about...

Trading is about being okay with ambiguity. It's about tolerating confusion. It's about sitting with discomfort and being at peace with it. It's about not having an exact script of when to trade or not to trade, or what's really a high odds trade, and being okay with that. It's about exceptions to the rules. It's about contradiction. It's about uncertainty. And yet traders left and right want to make it simple. They want to reduce it to a few simple set-ups to trade with discipline. And yet the market is not simple. The market is all about uncertainty, and complexity, and ambiguity. Simple set-ups could never capture that, and they can never give you a true lasting edge. So what's the solution? Is the problem in the simple set-ups themselves? No, it's in how they're being used. The bottom line is every trader needs to learn to READ the markets. This means that simple rules will not do.

There has to be a synthesis of different elements (whether they be price action, indicators, inter-market themes or whatever), and real-time interpretation must take place. It has to be all about CONTEXT. Once you can read the markets, and don't fool yourself it is a very complex process, then you can choose to employ "simple" set-ups to enter and exit. But the real work will be in interpreting the market to see when you should use which kind of set-up. Seeing a hammer or whatever near a support means nothing unless you've identified the broader picture and gotten a sense of the kind of tactics you should be using, and what the odds are for different scenarios unfolding.

So to conclude, based on all of the above, my advice to you would be to stop trading and make a mental shift. Realize what you need to do to become successful, and it's definitely not staying on this endlessly unfruitful path being supported by the hope of future profits. You're just running in your place unless you change your focus and your learning method. And if you thought the journey was tough so far, you haven't seen anything yet. Get ready for uncertainty and ambiguity like you've never seen it before. But this shouldn't be scary. It should be exciting, because this is what trading is all about. This is why it's called an ART. And it truly becomes one when you change your focus and your learning process. Then everything, including success, becomes possible. And until then, it'll be a distant dream that keeps appearing to be so close and yet stays so far away.“ (ZIAD, 2009)

3 Problem analysis and current situation

3.1 Broker comparison

There are thousands of brokerage companies which differ in provided services. In common we can say that US companies offer better deals than Czech ones. The observed criteria are mainly commission round turn and margin value. In those can be significant differences for the profitable trading. (It is really important whether you spend twice as more for the same service or not. Also the size of margin requirements decides how many positions you are able to open with a certain account.)

Another aspect is a broker reliability and credibility. Also the technological level of services such as technological support, trading platforms offered, security features etc..

One of significant issues I was dealing with was SL orders waiting at broker's servers or traders computer. In case that the internet connection goes down and trader does not have the order placed at broker's server but at his computer. Theoretically at this moment he faces an unlimited loss. One of the most basic rules at the market is to protect ones money.

3.2 Analysis and creation of trading plan and choosing the best option

3.2.1 Goals

The aim is to create a simple, strongly mechanical system, logical and easy to execute. The system will be using primary following instruments– CC and DIV. Also the limit entries with maximum predefined risk 100 USD per trade, this is because of the MM rule of 2 %. The goal is to create a system which will have a monthly profit of 500 USD in average. This amount is reviewed as decent for 1 contract. It is expected that the strategy will be traded with more contracts, but the maximum with keeping comfort is about 7 (generally known), from this number can occur problems with filling all portion of contracts - talking about E-mini Russell 2000, the ES 500 can fill much more. The emphasis is laid on comfort execution and on minimally hesitation. It

is believed some small discretion is still needed and acceptable. Also the risk is demanded very low.

It has to be said that the chosen market for primary analysis was E-mini Russell 2000, this instrument was chosen for its biggest moves considering the dollar value, (biggest among the e- mini complex – TF, NQ, ES, YM). The market is characterized by nice big trending moves. The disadvantage is that the market is more aggressive and dynamic and with bigger tick - the smallest move is 2x bigger than in the other markets, therefore the higher SL is required – higher need for capital.

3.2.2 Backtest

Trend pattern

The testing started with the trend pattern on TF. Results can be seen in the table. To comment the output it is needed to mention the general MAE MFE analysis first, which gave us the best values for SL and PT. To build on those values, we can step to further and more complex testing. The testing period starts on March 2011 and continues till August 2011. Always first hour and half after markets are opening. Overall 3 variants were tested:

- Simple PT 250 USD, SL 100 USD, and no BE adjustment. As seen in the table this version ended as untradeable with a real small profit
- Another test performed the option - SL 100, PT 250, BE+1 after 150, SL -50 after 100 + MACD ES went better with a profit of 760 USD
- The last one considering the trend pattern - SL 100, PT 210, BE+1 after 150, SL -50 after 100 + MACD TF + MACD ES. This setting offered profit of 1340 USD. Therefore this option is evaluated as the best and undergo further to the trading portfolio and later to live trading. It was noticed that this pattern is quite rare (the greater win ratio it has)

			00, PT 250, BE+1 po 150, SL -50 po 100 + MACD TF + MAC					SL 100, PT 250, BE+1 po 150, SL -50 po 100 + MACD ES					bez posunu BE, SL 100, PT 210					
	Date	Time	Price	Exit	MFE	P/L	equity	Exit	MAE	MFE	P/L	equity	MAE	MFE	P/L	equity		
TF-06-11	22.3.2011	15:57	807,5			0,9	-0,4	-0,40										
	23.3.2011	14:35	802,5 es			0,6	-0,8	-1,20	es	0,8	0,6	-0,8	-1,30		0,8	3,8	2,1	4,20
	24.3.2011	16:00	812,5 es			1,6	1,6	0,40	es	0,0	1,6	1,6	0,30		0,0	4,3	2,1	6,30
	25.3.2011	15:36	822,5 es			0,3	-0,1	0,30	es	0,6	0,3	-0,1	0,20		0,6	6,1	2,1	8,40
	29.3.2011	15:41	817,5 es			0,9	0,9	1,20	es	0,6	0,9	0,9	1,10		0,6	2,3	2,1	10,50
	1.4.2011	16:15	847,5 es			0,1	-0,6	0,60	es	0,6	0,1	-0,6	0,50		0,6	2,2	2,1	12,60
	12.4.2011	16:10	822,5 es			1,6	0,3	0,90	es	0,1	1,6	0,3	0,80		1,7	1,6	-1,0	11,60
	15.4.2011	15:50	822,5 tf			0,7	-0,6	0,30	sl1	5,2	0,7	-1,0	-0,20		5,2	0,7	-1,0	10,60
	19.4.2011	15:37	825,1 es			0,7	-0,8	-0,50	es	0,8	0,7	-0,8	-1,00		4,4	1,2	-1,0	9,60
	3.5.2011	15:37	852,5 es			0,2	-1,0	-1,50	es	4,8	0,2	-1,0	-2,00		4,8	1,4	-1,0	8,60
	11.5.2011	15:36	850,2 es			1,4	-0,2	-1,70	es	0,4	1,4	-0,2	-2,20		3,0	1,4	-1,0	7,60
*	12.5.2011	16:15	837,5 pt			2,1	2,1	0,40	pt	0,0	2,1	2,1	-0,10		0,0	2,1	2,1	9,70
	13.5.2011	15:39	845,0 es			2,0	0,9	1,30	es	0,2	2,0	0,9	0,80		0,2	2,5	2,1	11,80
	17.5.2011	16:00	820,0 sl1			0,0	-1,0	0,30	sl1	3,2	0,0	-1,0	-0,20		3,2	0,0	-1,0	10,80
	19.5.2011	16:14	832,5 es			1,4	0,9	1,20	es	0,4	1,4	0,9	0,70		1,7	0,9	-1,0	9,80
	20.5.2011	15:58	827,5 es			0,7	-0,2	1,00	es	0,3	0,7	-0,2	0,50		0,7	2,4	2,1	11,90
	23.5.2011	15:34	812,5 es			0,4	-0,7	0,30	es	3,1	0,4	-0,7	-0,20		3,1	0,4	-1,0	10,90
	1.6.2011	16:48	837,5 pt			2,2	2,1	2,40	pt	0,2	2,2	2,1	1,90		0,2	2,2	2,1	13,00
	9.6.2011	16:08	792,5 es			0,5	-0,9	1,50	es	0,9	0,5	-0,9	1,00		1,7	0,5	-1,0	12,00
	20.6.2011	16:42	782,5 es			0,6	-0,3	1,20	es	0,3	0,6	-0,3	0,70		2,6	0,6	-1,0	11,00
	23.6.2011	15:35	782,5 sl1			0,5	-1,0	0,20	sl1	2,2	0,5	-1,0	-0,30		2,2	0,5	-1,0	10,00
	24.6.2011	16:14	795,0 es			0,9	-0,1	0,10	es	0,4	0,9	-0,1	-0,40		0,4	2,2	2,1	12,10
	29.6.2011	16:04	812,5 es			1,7	0,4	0,50	es	0,1	1,7	0,4	0,00		3,0	1,7	-1,0	11,10
*	30.6.2011	15:47	822,5 pt			2,5	2,1	2,60	pt	0,0	2,5	2,1	2,10		0,0	2,5	2,1	13,20

Chart 6- Trend pattern backtest (created by author)

Divergence pattern

The divergence was much more thoroughly tested and analyzed in order to find a primary pattern for the portfolio. This goal was completed as can be found lower. The start of the testing period was 7.2. 2011 and the end was 31.1.2012, practically the beginning of the live trading. This period offered us overall 133 trades, that is already a sufficient number that can be build on. Again, many variants were taken into account and surprisingly almost each was pleasant.

	Number of long	55
	Number of short	72
Number of trades		136
Sum of profits		9690
Sum of losses		-5600
Number of profits		57
Number of losses		70
Average profit		170
Average loss		-80
RRR		2,125
Expectancy		32,2047244

Chart 7 - TF divergence backtest (created by author)

After reviewing many parameters such as: MACD over or under zero line, divergence of tops, rapid movement and time of entry, it was found out and concluded, that time of entry, size of entry bar, the size of penetration doesn't have any statistical influence on the success. The effect has only the size of SL and PT.

	Profit with moving and management	Profit with minimum length from the top	Profit with maximum length from the top	All filtering	All filtering without a strong move	Enter with length of the right foot	Enter with length of the right foot, time limited and length of the feet, managed
Number of trades	127	16	67	31	42	24	50
Sum of profits	8020	1480	4070	3120	3800	2680	5210
Sum of losses	-4660	-650	-2230	-590	-920	-390	-1190
Number of profits	60	8	33	19	26	15	31
Number of losses	67	8	34	12	16	9	19
Average profit	133,6666667	185	123,33333	164,21053	146,1538462	178,6666667	168,0645161
Average loss	-69,55223881	-81,25	-65,58824	-49,16667	-57,5	-43,33333333	-62,63157895
RRR	1,921816881	2,276923077	1,8804185	3,3398751	2,54180602	4,123076923	2,683383031
Expectancy	26,45669291	51,875	27,462687	81,612903	68,57142857	95,41666667	80,4

Chart 8- TF divergence backtest (created by author)

Further these criteria were considered at the backtesting:

- Trailing SL
- Profit with the minimal space to the top
- Entry to a space from the right foot of the pattern with time

The best performance offered the simple fixed PT and SL, but for relieving traders psychic BE shift was added, completed by MACD cross exits. This is not the most profitable option, but traders mind and comfort has to be taken care of. First of all the strategy has to fit the trader. Although the MFE and MAE values were 170 and 80 USD for SL. It was decided to have the same as for the Trend pattern (210 and 100 USD), in order not to confuse trader with switching parameters while trading under stress. This change "cost" 700 USD.

			Pin range		MACD ES	PREV TREND	Limit na CC		MAE		MFE		PT		PT/SL		Úspěšnost	
			Tick	0,1			Vstup	SL	0,565	0,51	2,61				5280	0,331521739		
11.1.11	2E+05	2	-1	792	793	262	1,3											
14.1.11	2E+05	1	-1	800	801	860	0,8											
18.1.11	2E+05	1	-1	805	806	580	0,8											
18.1.11	2E+05	1	1	805	805	555	0,7											
20.1.11	2E+05	1	1	774	776	2023	1,4											
20.1.11	2E+05	2	-1	779	781	596	1,2											
26.1.11	2E+05	1	-1	780	780	390	0,7											
27.1.11	2E+05	1	1	792	793	181	0,5											
1.2.11	2E+05	1	-1	790	791	457	0,7											
2.2.11	2E+05	2	-1	797	798	270	0,9											
3.2.11	2E+05	1	-1	795	795	518	0,9											
3.2.11	2E+05	1	-1	795	796	568	0,9											
4.2.11	2E+05	1	-1	794	795	708	0,7											
4.2.11	2E+05	1	-1	795	796	331	0,8											
8.2.11	2E+05	1	-1	805	806	368	0,8	1										
9.2.11	2E+05	1	-1	812	813	519	0,8	1										
10.2.11	2E+05	1	-1	807	808	874	0,9	0										
11.2.11	2E+05	1	-1	810	811	733	1,3	0										
17.2.11	2E+05	1	-1	827	828	151	0,4											
22.2.11	2E+05	2	1	821	823	773	1,7	1										
23.2.11	2E+05	1	-1	809	811	662	1,4	0										
23.2.11	2E+05	2	-1	809	811	753	1,9	0										
24.2.11	2E+05	1	-1	805	806	1411	1,6	0										
24.2.11	2E+05	1	-1	805	806	521	1	1										
2.3.11	2E+05	1	-1	807	808	320	1,2	1										
2.3.11	2E+05	1	-1	807	808	651	1	0										
4.3.11	2E+05	1	-1	825	826	494	1,2	0										
8.3.11	2E+05	1	-1	819	820	952	1,3	1										
8.3.11	2E+05	1	1	819	820	593	1,5	0										
9.3.11	2E+05	1	1	819	821	641	1,6	1										
11.3.11	2E+05	1	-1	795	796	586	1,2	0										
15.3.11	2E+05	1	-1	782	783	504	0,9	1										
16.3.11	2E+05	1	1	783	786	3812	3,1											
16.3.11	2E+05	1	1	782	784	637	1,5	0										
17.3.11	2E+05	1	1	787	788	146	0,9	1										
29.3.11	2E+05	1	-1	817	818	314	0,9	1										
1.4.11	2E+05	1	1	844	845	414	1,3	1										
6.4.11	2E+05	1	-1	857	858	604	0,8	0										

Chart 9- TF div. backtest trades (created by author)

Pin bar, inside bar

For evaluating various approaches, an ATM strategy in software called Ninja Trader was created. Information about the inside bar pattern is mentioned earlier in the theoretical part of work. This pattern was programmed and the backtest went through. The computerized backtesting was very comfortable. The work was done within few minutes instead of hour while the “manual” backtesting. Unfortunately the results ended very badly. The equity curve was unstable ended in negative value, performing too many trades – 851 in only two months, which is unacceptable amount even for daytrading, therefore this strategy was denied and no further developed. More can be seen lower.

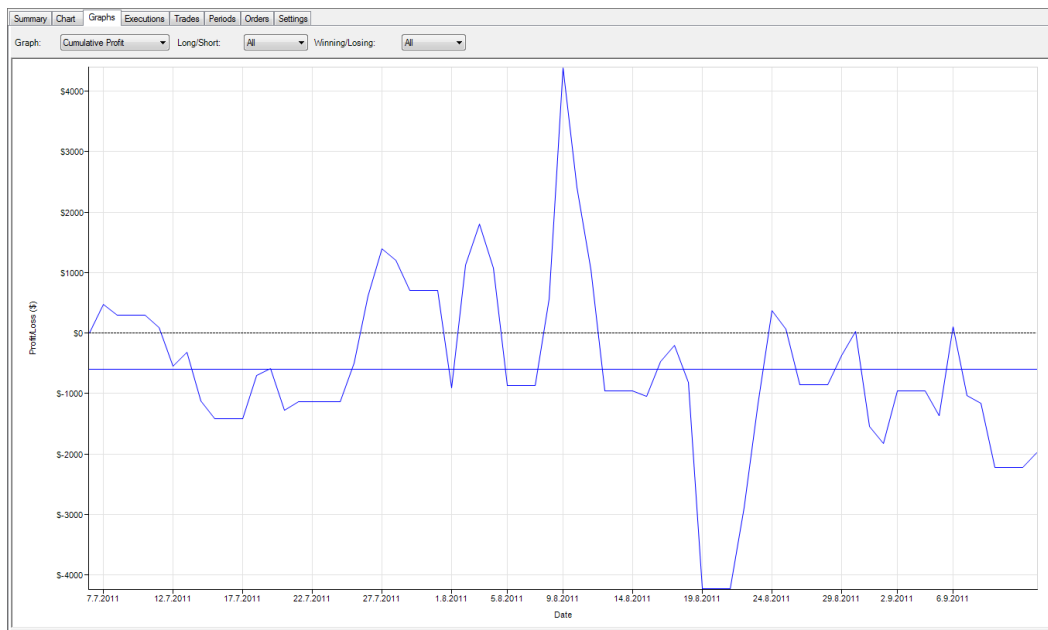


Chart 10- TF inside bar equity (created by author)

```

14
15 namespace NinjaTrader.Strategy
16 {
17     [Description("")]
18     public class StrgInsideBar : Strategy // !!!! StrgVzor nahradit nazvem strategy = stejný jako název souboru !!!!
19     {
20         // tady se nastavují základní parametry pro strategy
21         private int seance_1_Od = 153500; // začátek první části seance ve tvaru HHMMSS
22         private int seance_1_Do = 170000; // konec první části seance ve tvaru HHMMSS
23         private int seance_2_Od = 180001; // začátek druhé části seance ve tvaru HHMMSS
24         private int seance_2_Do = 180000; // konec druhé části seance ve tvaru HHMMSS
25
26         private int tickSlLong = 10; // SL počet ticku
27         private int tickSlShort = 10; // SL počet ticku
28         private int posunBeLong = 50; // počet ticku pro posun na BE
29         private int posunBeShort = 50; // počet ticku pro posun na BE
30         private int tickBeLong = 1; // BE+ počet ticku
31         private int tickBeShort = 1; // BE+ počet ticku
32         private int tickPtLong = 20; // PT počet ticku
33         private int tickPtShort = 20; // PT počet ticku
34         private int tickStopLong = 50; // počet ticku po kterém je rušen vstup
35         private int tickStopShort = 50; // počet ticku po kterém je rušen vstup
36
37         private double HighInsideBar = 0;
38         private double LowInsideBar = 0;
39
40         // Variables_pracovni - do tohoto bloku nezasahovat !!!!
41         Variables_pracovni
42
43         protected override void Initialize()
44         {
45             CalculateOnBarClose = true;
46             Add(PeriodType.Tick, 1);
47             Add(PeriodType.Volume, 200);
48         }
49
50         protected override void OnBarUpdate()
51         {
52             if (BarsInProgress == 0) // Kod pro základní TF, tedy ten na kterém testujeme strategy
53             {
54                 if (High[0] < High[1] && Low[0] > Low[1])
55                 {
56                     HighInsideBar = High[1]; // je InsideBar, tak uložíme hodnoty
57                     LowInsideBar = Low[1];
58                 }
59             }
60         }
61     }
62 }

```

Chart 11- inside bar source code in Ninja Trader (created by author)

Summary	Chart	Graphs	Executions	Trades	Periods	Orders	Settings
Performance		All Trades					
Total Net Profit		\$-1980,00					
Gross Profit		\$86210,00					
Gross Loss		\$-88190,00					
Commission		\$0,00					
Profit Factor		0,98					
Cumulative Profit		-3,65%					
Max. Drawdown		-12,52%					
Sharpe Ratio		-0,76					
Start Date		7.7.2011					
End Date		12.9.2011					
Total # of Trades		851					
Percent Profitable		40,66%					
# of Winning Trades		346					
# of Losing Trades		505					
Average Trade		0,00%					
Average Winning Trade		0,35%					
Average Losing Trade		-0,24%					
Ratio avg. Win / avg. Loss		1,43					
Max. conseq. Winners		6					
Max. conseq. Losers		9					
Largest Winning Trade		6,60%					
Largest Losing Trade		-2,39%					
# of Trades per Day		12,51					
Avg. Time in Market		21,6 min					
Avg. Bars in Trade		21,6					
Profit per Month		-1,65%					
Max. Time to Recover		34,00 days					
Average MAE		0,24%					
Average MFE		0,35%					
Average ETD		0,36%					

Chart 12- Inside bar results (created by author)

TF PIN

Also after backtesting the pin bar pattern with not very convincing output - it was decided not to include this pattern into the trading plan either. So this strategy will not have its place in my trading portfolio.

The results were interesting, but for the pattern was not included to the portfolio, because it lacks the context, I could not trade the pattern standing alone. I would not have the trust in it. Also the pattern had unstable profits – extremely differences among months – highly profitable, highly losing and months with no action too. The pattern

was not rejected for its profits but for its nature. However it would be a great pattern for computer automatic trading systems.

Month	Profit FIX	%win				
1	220	0,28571429		Number long	123	
2	650	0,38461538		Number short	155	
3	-580	0				
4	120	0,28571429		Number of trades	184	
5	60	0,25		Sum of profits	15250	
6	-480	0,07692308		Sum of losses	-9970	
7	60	0,22222222		Number of profits	61	
8	610	0,35135135		Number of losses	123	
9	130	0,3125		Average profit	250	
10	2560	0,70588235		Average loss	-81,056911	
11	220	0,24		RRR	3,08425276	
12	-60	0,2		Expectancy	28,6956522	
13	1770	0,72727273				
SUM	5280	0,33152174				

Chart 13- TF pinbar backtest (created by author)

ES DIV

Further instrument and the pattern tested and analyzed was the ES div. The setting was PT 150, SL 100 USD, no other interference. With its insufficient results also did not take the place in the trading portfolio. At first the testing looked promising, but in the middle of the year the equity started to go in the red numbers. Especially the DD was simply intolerable.

	Num. of all trades	Num. of win trades	Num. of lose trades	% profitable	Commissions	Sum of win trades	Sum of lose trades	Pure gain	Avg. win trade	Avg. lose trade	Avg. trade	RRR	Max DD
Without shift	105	39	66	37,10%	462	9750	-4750	4538	250	-72	43,2	3,5	-1120
With shift	105	53	52	50,50%	462	8690	-3530	4698	164	-67,9	44,7	2,4	-730

Chart 14- ES div backtest (created by author)

3.3 Strategy trading plan

3.3.1 Money management

Many variants were tested and analyzed with various outputs. But of the best outcomes resulted in following detailed rules (stated lower) which are prepared for profitable live trading. The paper trading faze was skipped. Because there was almost no need for paper trading while using strongly mechanical systems. And also the markets environment and trading platform was previously well know. This faze was evaluated as useful but not necessary.

3.3.2 Complete trading plan

15:00 - 15:25	Read Tp, reports, set the platform, Dimension 4, basic graphs analysis (TF: 1h, 30m, 1m,; ES: vol 5000) - DT, DB, Pin bars, structure
15:25 - 15:30	Relaxation
15:30 - 17:00	Trading
17:00 - 17:10	Evaluation - recording trades and graphs

Chart 15- Timetable (created by author)

Patterns:

Trend

1. Time check
 - a. Trading from 15:30 to 17:00
 - b. While report, do not enter position 5 minutes before report
 - c. If there is a report announcement, do not enter position 5 minutes after that.
 - d. While in position and already BE+1, can be in position over report
 - e. While in position and still not BE+1, close the position 3 minutes before report by market order

Long:

1. ES, TF: Check if the CC's are fresh
2. ES: Check that I will not enter against divergence
3. TF: Check if the trend already did not run out more than 800 USD.
4. ES: MACD green over red , over zero line
5. ES: penetration of the CC in uptrend (green bar has to close over the CC)
6. ES: the order has to be sooner or together with the penetration of the CC on TF
7. ES: after the CC penetration the price has to move within 150 USD from the CC penetrated
8. TF: MACD green over red , over zero line
9. TF: penetration of the CC in the uptrend (green bar has to close over the CC)
10. TF: if there is a structure change over the CC within 5 tick, I wait for the structure penetration (green bar has to close over the structure)
11. TF: after the penetration the price gets maximally to 140 USD, if it does 150 USD and more the order is not placed
12. TF: enter buy limit on the CC (PT 210\$, SL -100\$, if the position is in 100\$ in profit, move SL to -50, if in open profit of 150\$, move to BE+1)
13. TF: if the order is not filled and the price gets to 150 USD and more, the order is to be cancelled
14. TF: if the structure is rejected exactly by tick, I move to BE+1
15. TF: exit on PT, exit on SL, exit on crossing of MACD to short on TF or ES

Divergence

1. Time check
 - a. Trading from 15:30 to 17:00
 - b. While report, do not enter position 5 minutes before report
 - c. If there is a report announcement, do not enter position 5 minutes after that
 - d. While in position and already BE+1, can be in position over report
 - e. While in position and still not BE+1, close the position 3 minutes before report by market order

Long:

1. ES: MACD green over red
2. TF: left shoulder from 13:00 of the same day
3. TF: ling divergence creation
4. TF: MACD green over red
5. TF: MACD –the cross has to be before or while penetrating the CC long
6. TF: close of the right shoulder of the divergence has to be within 150 USD from the CC (only after 16:15 - 16:30)
7. TF: penetration of the CC in the uptrend (green bar has to close over the CC)
8. TF: if there is a structure change over the CC within 5 tick, I watt for the structure penetration (green bar has to close over the structure)
9. TF: after the penetration the price gets maximally to 140 USD, if it does 150 USD and more the order is not placed
10. TF: enter buy limit on the CC (PT 210\$, SL -100\$, if the position is in 100\$ in profit, move SL to -50, if in open profit of 150\$, move to BE+1)
11. TF: if the order is not filled and the price gets to 150 USD and more, the order is to be cancelled
12. TF: if the structure is rejected exactly by tick, I move to BE+1
13. TF: exit on PT, exit on SL, exit on crossing of MACD to short on TF or ES.
(FOCUS, 2011)

Supporting factors

- Right shoulder on low of the day
- Left shoulder under the CC, right shoulder over the CC
- Divergence on ES long

3.3.3 Additional rules

- 2 trades per day max
- At the divergence wicks can stand in the way
- As soon as the MACD crosses, the potential divergence is cancelled
- There has to be higher high and close in order to be valid divergence
- If the momentum is exhausted or the divergence is too far, than it is invalid
- Divergence only at high/low of the day
- Be aware of pin bars on higher timeframes
- At 1600 more aggressively, at 1700 be more careful
- Divergence – legs has to be over the zero line in case of long, short visa versa
- While trend pattern, first has to EMA's cross the zero line and than the CC cross
- Take only two highest tops of MACD

When the MACD crosses the zero line there and back, the level is considered as fresh one. If there is a strong trend and momentum. Or the situation looks “good” we can consider the situation more discretely. And if there are few millimetres or second missing, we can still take the trade. This rule is valid only exceptionally. A little bit of trading art is necessary. But still in the boundaries of the trading plan. This can make huge difference.

4 Proposals and contribution of suggested solution

4.1 Live-Performed trades of chosen option

4.1.1 Description of chosen trades

At this place I will provide an overview of some realized trading days for the purpose of analysis.

To start analysis of this trading day which was on 9.2.2012 we can begin with establishing downtrend after the opening at 15:30. After TF dropped 500 USD it started creating a pullbacks with right leg diverging. So after checking all my trading plan items – TF div? OK, ES, TF MACD? OK, CROSS CC? OK, I executed an entry order, one contract – limit placed at 8250 with a SL at 100USD. Three minutes later, the order was successfully filled. Unfortunately the market previously couldn't cross the structure so it turned back in the downtrend and quickly hit my SL at the value of 90 USD (I was filled with a positive slippage 1 tick – 10 USD). MFE in this trade was only 1 tick, that means that the market did the exact opposite than expected. This is the reason we use stoplosses. We have to think in a wider horizon and have to be “aware” of statistics and probabilities.

The bears continued their direction and after another hour I got next signal. It was again a divergence, but after receiving a full SL I did not feel very comfortable, however this is exactly what sorts winners and losers – I had to obey my trading plan and I did. However I could not resist the feeling that 2 losses in a day would be painful. Speculation that the trend is exhausted and that there are no longer any sellers, which usually appears when the trend does more than 1000 USD, just like in this case. So after controlling all the checkpoints – TF DIV? OK, ES, TF MACD? OK, CROSS CC? OK and after considering 60 and 30 minute timeframes, where I checked the structure of swings and pin bars I placed a limit order – 1 contract at 820 long. I have to admit, I did not believe in this trade at all, but plan was a plan. Trading is not about beliefs and emotions, that I know very well. The order was again filled and my account immediately was exposed 80 USD open loss. Just only shortly, at that position the market reversed with a volatile bar and soon my SL was moved from – 100 to – 50 and a moment afterwards to BE +1, where it had to face a small correction to gain a full PT

at 210 USD after a strongly volatile bar. The trade took 13 minutes and for me as a trader it was quite emotional, nervous and difficult day, but ended well – with 100% discipline and that is the most important aspect plus the previous loss was erased. (lower you can see the commented trade screenshot)



Chart 16 - 9.2.2012 Day analysis (created by author)

Another example of one of my trading worth-mentioning days was the 30.3.2012, which was a little demonstration of discretion, more aggressive trading – thing that differs live traders from AOS computer programs. At 15:30 hours, there was a divergence forming with left leg at 14:08. The signal was supported with declining MACD on ES, the swing structure on TF was far enough (at 8327), 60 and 30' timeframes were OK, and what more, there was a strong pin bar developed at 15:31 hours. And right after opening we can expect bigger moves (but also have to be careful), the whole complex of markets was to a downtrend. So after considering all these facts I decided to short the market even if the TF MACD was missing few millimetres to be absolutely valid. This judgement proofed to be very professional. In this case I used some % of discretionary thinking and took the trade little bit more aggressively. It was not a violation of my plan, it was just more aggressive, still in boundaries of my strictly

defined plan. Because the market does not care about 0,2 millimetres at some MACD indicator, it does not reflect anything, surely not all the traders' minds. A computer programmed AOS trading system would not do that, but I am a trader, I think and can be discretionary and that is my edge on the markets. The market's open is at 15:30, after crossing CC at 15:31:00 I placed a limit order short, size 1 contract at the value 8350 at 15:31:01 and the position was filled at 15:31:02.! This shows how extremely fast daytrading can sometimes be, and how emotionally exerted. And trader has to respond often very quickly, which can even increase stress.

The trade went all well, with almost no heat (MAE) -10 USD, and in almost 2 minutes I was at BE+1, so I could not lose any money any more, which I felt very comforting. This trade happened to be nice quick one winning trade, nothing stood in its way – less than 4 minutes – 210 USD was made (of course not every day is like this one, losses are also natural part of this business). To summarize that- 100% discipline with a bit of aggression.

A short while later, new signal was creating. Again a nice valid divergence with shoulders in 2 price levels (those are the strongest ones), there appeared also a divergence in the ES market which is considered as a supporting signal, so according to the plan – TF DIV? OK, ES, TF MACD? OK, TF CROSS CC? OK, LIMIT IN? OK, SL-100USD? OK, OUT – SL? OK. Good trade which ended on full SL – 100USD. The price did not reverse, it made only a small correction and continued in downtrend, however there was enough space to the swing high. This is absolutely normal issue in trading and there is no need to worry about anything. In conclusion a good, profitable day, the plan was successfully fulfilled – objective completed.



Chart 17- 30.3.12 Day analysis (created by author)

A different situation that happen to be on 22.3.2012 was the Trend pattern - It occurred at 15:05 (Due to US time change, that is 14 days sooner than in Europe) after markets were set up following: establishing an uptrend after markets opening brought soon a correction which was thought to continue in bulls rally plus there was also a positive fundamental news at 14:30. At 15:04 all conditions of the trend pattern were made, such as: ES crossing CC, TF and ES MACD in “OK position”. All aspects were supporting the decision.

After TF crossing CC there was no doubt about going long and placing a limit order at the value 8200. Taking in notice the space to the swing high, of course. With the first bar the order was filled and following bars were exposing my money in loss position. It showed that the market probably would not continue with uptrend and stopped at the near strong SR level and making a nice double top, the market gave me 100 USD loss. In fact the move was so strong, that I suffered a negative slippage -110 USD (this was not considered in backtests!) The uptrend turned to be a downtrend. In fact I was standing at the exact opposite side where I should be, but everything was according to

the plan. And that what counts – 100% discipline. Good example why traders should use their stoplosses.



Chart 18- 22.3.2012 Day analysis (created by author)

Next trade worth analyzing was on 16th of April. At the opening the price was several times attacking a very strong SR level the 8000. And with its last unsuccessful attempt it reversed and headed to the south. The momentum was so strong that the market did 1000 USD (golden point) in less than half an hour. Unfortunately I was not present in this move, my conditions were not fulfilled. The price stopped almost without any correction at 7875. After analyzing 30' and 1 hour graph, it was clear that the market created a very strong double bottom, left leg was 5 days earlier. This level was so important that, some action from other traders had to be expected.

Also trading is not only about indicator x crosses 0 line and y does something else. It is about putting entries in wider context. Therefore I assessed the situation as a strong opportunity even though few “millimetres” were still missing. Even more, another small intraday DB was created as a sign of a pullback and a changing trend. Plus after moves like this a bigger correction is expected. So when I checked the TF DIV, ES and TF MACD and crossing CC I placed the order at 7900 long. Filled by next bar it made an

open profit 170 USD very quickly but suddenly started making a correction. Plan told me to exit the trade when ES MACD crossing, so this was executed. Few seconds later I saw another reversion of the price and it went quickly to my potential PT but already without me. I had to come out and be pleased with 40 USD instead of 210. I was naturally little disappointed, but this is normal, this is what happens and people must not be greedy in this business or they can't succeed. After all, very nice trade and the plan was completed, the day ended with a small profit.

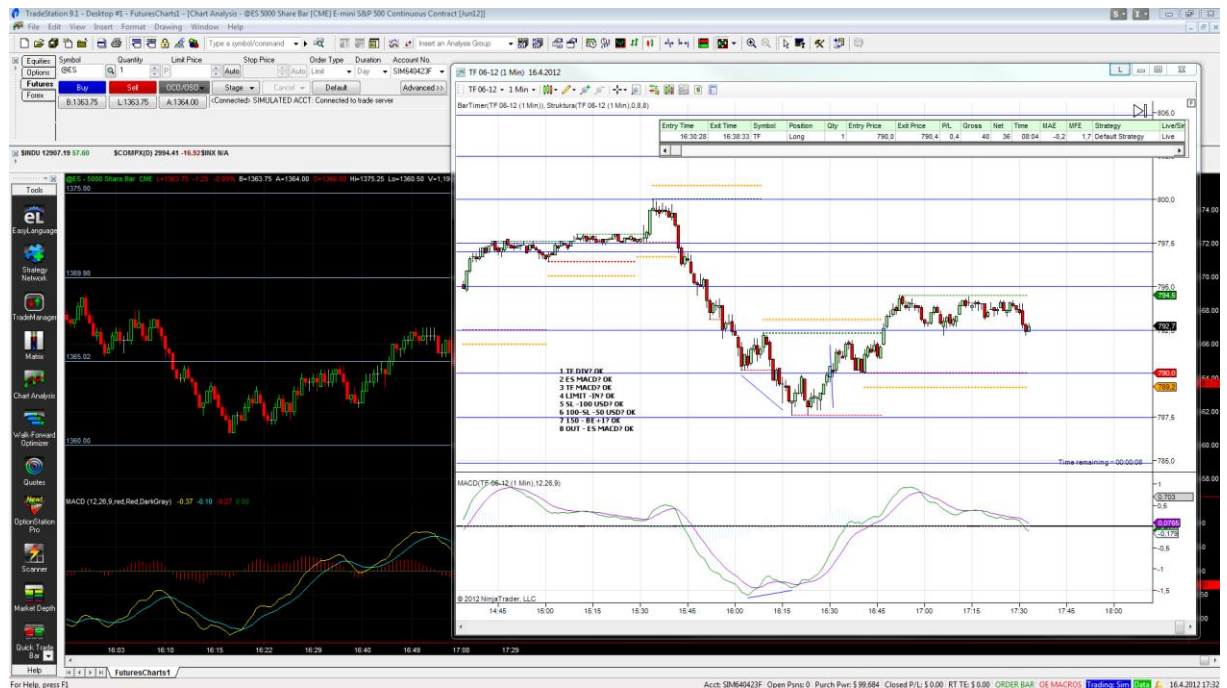


Chart 19- 16.4.2012 Day analysis (created by author)

Additional trading rules

This list of rules and notes was read every single day before own trading in order to prepare the trader for the performance. The goal was to remember important aspects, calm down the mind and be relaxed and prepared for work. I have to admit that this psychological support was very helpful and really worked. I was trading “in the zone” and the stress was much lower, but still some. This feature is widely recommended and valuable while daytrading.

Another supporting feature was the table of tasks, where the trader evaluates himself each day how he performed. Also in the task section were mostly things where the trader had problems and weak spots. This exercise helps to achieve better results because the trader concentrates on fulfilling the objectives and 100% discipline and not on his emotions and is not influenced by them.

06-10_2/12	10	Discipline 100% OP !!!
	1	1 Bigger professionalism, 100% engagement
	5	5 record trades in the log, backtest
6.2.2012	10	ok
	1	ok
	5	ok
7.2.2012	10	ok
	1	ok
	5	ok
8.2.2012	10	1
	1	1
	5	ok
9.2.2012	10	ok
	1	ok
	5	ok
10.2.2012	10	1
	1	1
	5	ok
Number of errors		4

Chart 20- Task performance evaluation (created by author)

Trading goals

- 100% discipline of my trading plan
- 2 patterns on russell2000 according to the TP
- Record and evaluate them every day
- Reach the planned target of 500usd
- Trade 3 contracts until 6 months

Golden trading rules

- Have a plan and a strategy
- Obey this plan and strategy
- Use stop los
- Control and reduce risk
- Let the profit trades run
- Trade with trend
- Do not trade fundamentals
- In trading relay only on myself and my patterns
- Money management and position sizing
- 100% discipline

8 truths about market

- In markets anything can happen
It is not important to know what happens in a moment to make money at the market
- Profits and loses come in a random order
- Every trade has an absolutely unique result
- Every moment in the markets is unique
- Losses are the unavoidable part of trading, you can only control them
- It always be needed to return a part of the profits back in to the markets

- Without a 100% discipline and a the trust into my plan and patterns I cannot have a long term success

My edge

- 100% discipline
- Own patterns that only 1 trade
- System built on the direction of the market ES (Vol500) and the MACD indicator
- Trading of two patterns on the market TF after the penetration of the CC on the ES in MACD direction
- Consistent records and analysis of trades
- Logical and simple strategy

My trading axioms

- Never entry the position based on feelings
- Discipline, restraint, and the ability to deal with losses
- Strict, mechanical obeying of rules just like pilots
- Consistent, no emotions, professionally
- Trading is 60% psychology, 30% MM and only, 10% entry strategy
- Trade less, gain more
- There can be a losing month or two, but it is still ok
- The equity curvy usually goes to the minus in the beginning
- Trying to improve myself, doing good trades, learn to self-control
- 20 USD daily is a nice number
- Trading is statistics
- Calm, peace, relaxation (FOCUS, 2011)

If I gain many small losses and few big winning trades, in a long term still I will be in profit with a system with low probability. For all, it is needed to control our own psychic, to be able to execute signal by signal according to our trading plan, only those who succeed in it, have a chance to achievement.

The ability to be still consistent, not to panic and a not fall into a depression in times when we are not doing good is called discipline, restraint and the ability to deal with losses. Losses are natural part of successful trading and we can't avoid small losses if we want to be consistently profitable in trading business.

4.1.2 Summary of trading results

At this point a will evaluate the trading results from the trades which were executed from 1.2 – 30.4. Three month is already a decent time sample for a relevant evaluation. And usually strategies are evaluated right after this period. First, it has to be said and it is important, that the results capture a real live trading with real money (not any demo version paper trading). Every day for the 3 months I was at the computer and traded for 2 hours. It was done honestly and with discipline. So it has a real testifying value. In conclusion, It was expected that the trading strategy will perform about 30 % worse than in backtest but the real results were even worse, proximately the result was 40% of the backtest. The system made weak 378 USD in 3 month per 1 contract. (traded with 1 contract, Excluding commission fees for the broker which were 125 USD). This represents 30% of the total profit, which is totally unacceptable. The costs are simply too high and for daytrading very unusual.

LIVE 2012 - 1CTR	3 month
START ACCNT	\$8 954,0
END ACCNT	\$9 207,0
NETTO PROFIT/LOSS	\$253,0
COMMISIONS	\$125,0
NUMBER OF TRADES	27
PROFIT. TRADES	12
LOSS TRADES	15
PROBABILITY WIN%	44%
MAX. EQUITY	\$378,0
MAX. DD	\$230,0
GROSS PROFIT	\$1 520,0
GROSS LOSS	\$1 142,0
AVERAGE NET TRADE	\$9,4
AV. PROFIT. TRADE	\$115,0
AV. PROFIT. LOSS	\$67,3
RRR	1,70
MEDIAN OF PROFIT TRADE	\$120,0
MEDIAN OF LOSS TRADE	\$90,0
COST OF TRADE INC. MONEY TRANSFERE	\$5,2

Chart 21- Live results (created by author)

Overall there were made 27 trades, 12 were winners, 15 losses. That is 0,5 trades per day – also very low rate for daytrading. Trader can feel boring and also that he is sitting in front of the computer “for nothing” The win ratio was 44% which is almost the only indicator that went as planned, but doesn’t say anything standing alone. The average trade made a very small profit of 9,4 USD – absolutely unsatisfying and not worth of trading. Highest profit was a full PT.

Number of losing trades can be higher than the number of profitable but the strategy still can be profitable, because the risk reward ratio (RRR) is 1:1.7 = average gain is greater than the average loss. In other words, you can have 5 losses, each of 100 USD and then only one profit in the amount of \$ 700, but still you will earn 200 USD, although the number of losing trades is far greater. That is why the actual numbers as RRR or percentage of profitable trades do not tell anything. You need to have these indicators together and still embedded in the context of other numbers.

The biggest loss was 110 USD caused by a quick market movement and following negative slip. Maximum drawdown from the equity curve was 230 USD - (in March which was extremely bad trading month) which represents less than 3%, that is also a nice number. Risk reward ratio (RRR) was 1,7. The strategy did great at not losing money but failed at making money – missing out the most significant market moves. Overall poor performance with small number of trades offered. But still ended over zero, that can be found as a positive and good result for starting trader and many opened questions for improvement. Many issues were discovered from the psychological part of the problem. And that tells more than plain numbers...In March the system even gave the loss 230 USD. The performance showed that the system is at the edge of being tradable. This is caused not only by the quite poor results. But mostly for its logic, which is sometimes found to be extremely difficult for trader's psychic. To find out about these factors the system had to undergo the live test.

None of this was known previously of the backtest. To explain this – the strategy is on one hand very comfortable for trading – (limit orders, prevent from overtrading in choppy days, simplicity waiting for bar close, quoted SR levels – the CC, very mechanical, strict rules, not many enters per day but on the other hand it can sometimes make the trader very frustrated. Not only to criticize it has to be mentioned that only few people trade this same strategy, which is an advantage. In March the market moves were really very poor and many traders made big losses, however my mild strategy made only 200usd loss, which I consider not so bad. This strategy also helps to obey the plan with its simplicity and it is relatively easy for the trader to be 100% disciplined – this is a great plus.

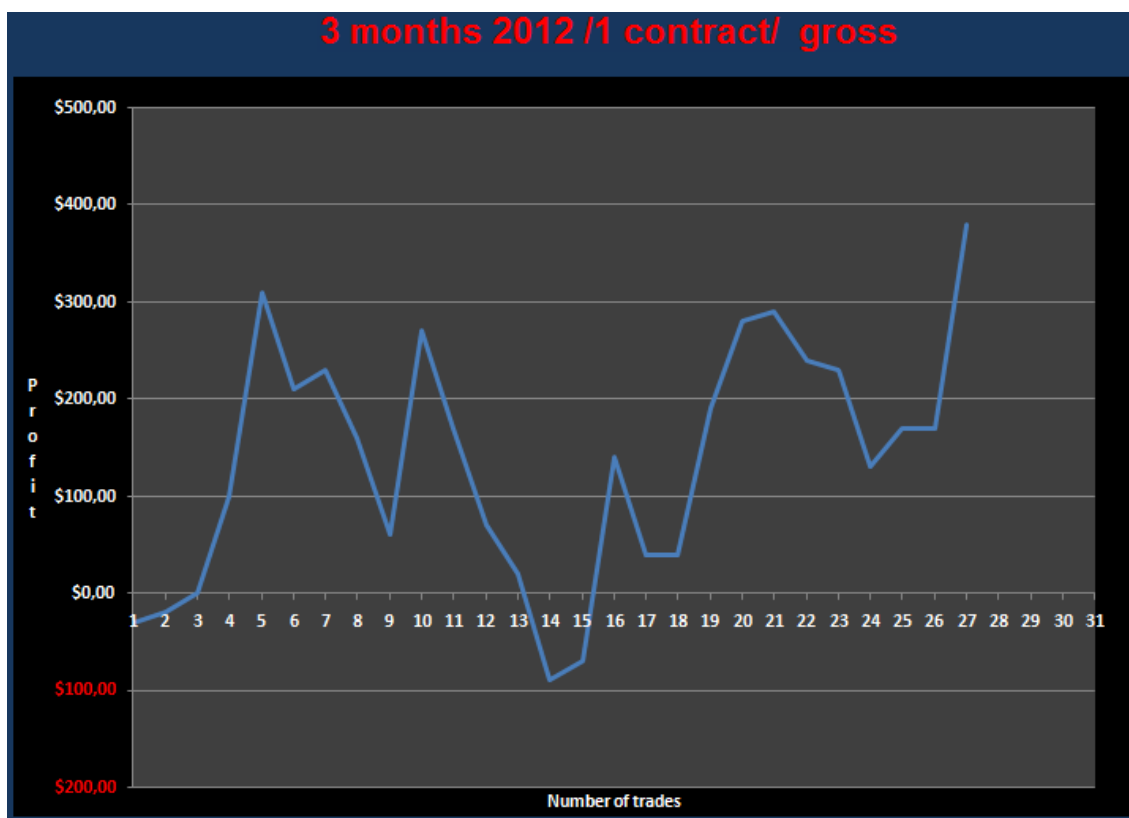


Chart 22-Live results equity (created by author)

	TRH	Datum	Pattern	L/S	Q	IN	P/L	Profit	Cum. Profit	CMMS	Winn	Loss	Winn	Loss	Out	100%	Cum.100%
1	TFH12	2.2.2012	DIV	S	1	15:46	L	\$30,00	\$30,00	\$4,00	0	1	0,00	30,00	TF MACD	30,00	30,00
2	TFH12	3.2.2012	DIV	S	1	16:23	P	\$10,00	\$20,00	\$4,00	1	0	10,00	0,00	ES MACD	20,00	20,00
3	TFH12	6.2.2012	DIV	S	1	16:14	P	\$210,00	\$190,00	\$4,00	1	0	210,00	0,00	PT	190,00	190,00
4	TFH12	9.2.2012	DIV	L	1	15:59	L	\$90,00	\$100,00	\$4,00	0	1	0,00	90,00	SL	90,00	100,00
5	TFH12	9.2.2012	DIV	L	1	16:44	P	\$210,00	\$310,00	\$4,00	1	0	210,00	0,00	PT	210,00	310,00
6	TFH12	15.2.2012	DIV	L	1	16:33	L	\$100,00	\$210,00	\$4,00	0	1	0,00	100,00	SL	100,00	210,00
7	TFH12	23.2.2012	TREND	S	1	15:38	P	\$20,00	\$230,00	\$4,00	1	0	20,00	30,00	ES MACD	30,00	230,00
8	TFH12	1.3.2012	TREND	L	1	15:34	L	\$70,00	\$160,00	\$4,00	0	1	0,00	70,00	ES MACD	70,00	160,00
9	TFH12	7.3.2012	DIV	L	1	15:55	L	\$100,00	\$60,00	\$4,00	0	1	0,00	100,00	SI	100,00	60,00
10	TFH12	8.3.2012	TREND	S	1	15:56	P	\$210,00	\$270,00	\$4,00	1	0	210,00	100,00	PT	210,00	270,00
11	TFH12	12.3.2012	DIV	L	1	16:54	L	\$100,00	\$170,00	\$4,00	0	1	0,00	100,00	SL	100,00	170,00
12	TFH12	13.3.2012	DIV	L	1	15:16	L	\$100,00	\$70,00	\$4,00	0	1	0,00	70,00	SL	100,00	70,00
13	TFH12	14.3.2012	DIV	S	1	15:16	L	\$50,00	\$20,00	\$4,00	0	1	0,00	50,00	ES MACD	50,00	20,00
14	TFH12	22.3.2012	TREND	L	1	15:04	L	\$110,00	\$90,00	\$4,00	0	1	0,00	110,00	SL	110,00	90,00
15	TFH12	23.3.2012	TREND	S	1	15:10	P	\$20,00	\$70,00	\$4,00	1	0	20,00	0,00	ES MACD	20,00	70,00
16	TFH12	30.3.2012	DIV	S	1	15:31	P	\$210,00	\$140,00	\$4,00	1	0	210,00	0,00	PT	210,00	140,00
17	TFH12	30.3.2012	DIV	L	1	16:06	L	\$100,00	\$40,00	\$4,00	0	1	0,00	100,00	SL	100,00	40,00
18	TF	2.4.2012	DIV	L	1	15:41	P	\$0,00	\$40,00	\$4,00	1	0	0,00	0,00	BE	0,00	40,00
19	TF	2.4.2012	TREND	L	1	16:14	P	\$150,00	\$190,00	\$4,00	1	0	150,00	0,00	ES MACD	150,00	190,00
20	TF	4.4.2012	TREND	S	1	16:14	P	\$90,00	\$280,00	\$4,00	1	0	90,00	0,00	ES MACD	90,00	280,00
21	TF	5.4.2012	DIV	S	1	16:13	P	\$10,00	\$290,00	\$4,00	1	0	10,00	0,00	BE	10,00	290,00
22	TF	5.4.2012	TREND	L	1	16:43	L	\$50,00	\$240,00	\$4,00	0	1	0,00	50,00	TF MACD	50,00	240,00
23	TF	13.4.2012	TREND	S	1	16:02	L	\$10,00	\$230,00	\$4,00	0	1	0,00	10,00	ES MACD	10,00	230,00
24	TF	13.4.2012	DIV	L	1	16:40	L	\$100,00	\$130,00	\$4,00	0	1	0,00	100,00	SL	100,00	130,00
25	TF	16.4.2012	DIV	L	1	16:30	L	\$40,00	\$170,00	\$4,00	1	0	40,00	0,00	ES MACD	40,00	170,00
26	TF	17.4.2012	TREND	L	1	15:36	L	\$0,00	\$170,00	\$4,00	0	1	0,00	30,00	ES MACD	0,00	170,00
27	TF	20.4.2012	TREND	L	1	16:00	L	\$210,00	\$380,00	\$4,00	0	1	0,00	110,00	SL	210,00	380,00

Chart 23- Live results (created by author)

4.1.3 Evaluation of trading strategy and its project goals

Many times happened that one of the trading filters prevented to enter a nice trade. Usually it was few seconds of millimetres on the indicator. This feature was useful in March because the markets were almost choppy but in April there were many nice moves but in the system prevented us to take part of them. This was not noticed from the backtest, but when trading live, it is very frustrating and demotivating to watch nice trending market and don't have a trade even for a weak! This because of some "silly" rules which the market doesn't care about at all. The rules are set too strictly and partly do not reflect the market context, structure or dynamics. And missing beautiful trades make trader very angry and uncomfortable. Even if the trader "knew" or "felt" the move. The system is too set not to lose money instead of making money.

Another big problem, which caused the lack in the performance was the data and time problem. At the beginning it has to be said that the markets can be very quick and that even a time period of one second matters. Several times happened that the market closed the bar over the CC and the conditions for the entry were fulfilled. Or the divergence was drawn. But, after refreshing the charts the graph was different and the entry was invalid! (this happened even with the time synchronization software). This means that I took trades that I was not supposed to but not my fault. This matter of fact is very serious and also was not known at the backtest faze. This later partly solved with constant reloading of chart. Unfortunately this procedure takes from 40-50 seconds. So for this time, I have no trading charts, just blank windows. This also doesn't increase the traders comfort very much. The reloading solution can help with the divergence issue but not with the CC. It is just too slow and many times only one second matters a lot in intraday trading.

Later it was discovered that there are some small differences among the data providers and also that the live streaming and the following reload is not the same. It can be because the market is moving so fast and the data is coming to the user in small packages. To try to prevent this data can be provided from some reliable and more expensive data management company. This package would cost 150 USD, which I consider just too much to afford. Bigger problem is with the ES 5000 volume graph,

which is very data- sensitive. After all, this showed as very annoying that I was in trades I should not be and vice versa and could not do anything about that, and on the other side I was missing trades because of few seconds and indicator millimetres, that nobody cares about and which could even be caused by the inaccurate data feed. A small issue which frustrated a lot.

Another big problem was with the order filling. This showed only the live trading. If the price hits the limit order, it doesn't have to be executed. There can be many orders from other traders before me in the queue and my order doesn't have to be paired. This fact also was not taken into consideration and all trades like these were considered as filled in backtest. But this doesn't work in real trading many trades run away because of one tick and they would hit a potential PT. This issue made so big differences in results that I considered to change the strategy and enter the position on CC plus always one tick more. (Instead of 755.0 I would place 755.1) This challenge occurred also in case of exiting. What I would mark in the BT as PT filled, in reality was 1 more tick needed. This has to do with bid and ask spread prices. For further improvements in backtest the PT marked as filled must overcome the target price by 1 tick to be completely trustworthy.

Many other aspects appeared while live trading most of them were psychological nature few of them technical. The plan was to catch the momentum in the markets, which is caused by other traders fear and greed. But later I witnessed that momentum can only partly be caught by limit orders and that much more appropriate would be stop orders. In many cases after the momentum was exhausted, the market did a significant move, which could be caught only by stop orders, my indicators were finally "ready" and offered me the entry. But too late, after every one was already in or even jumping out. I should enter the plan according to the plan - very illogical and difficult to obey and trust.

Furthermore it showed that the values – 100 USD for SL and 210 for PT are not the best. The reason is that there are big players, who are aware of that and often scalp the market exactly for 100-110 USD. In many cases also, when the market did 190 USD from the CC, it slowed down or reversed. The reason is that many traders have their PT at the value 200 USD, so it is very illogical and not very sophisticated to have PT

behind this level at the value 210 and go against other traders. At least it doesn't help the psychology.

Also exiting on the ES MACD turned to be not very clever. Sometimes the markets went the opposite way, but I had to exit the market according to the plan at reversing ES, by this way I left some money at the market too.

4.1.4 Solutions for system optimization and improvement

Overall, the strategy proved to be slightly profitable in real markets. It has surely some advantages such as relative comfort; prepared trading levels in form of CC.

I decided to stop trading it and reanalyze it with knowledge from real trading. Important experience showed its main disadvantages which are – the strategy is too mild, prevents you from losing money but also from bigger profits. It has too little entries. For improvement I would suggest first of all usage of the stop entries (this will increase the trades by 60 % I guess), second I prefer applying more of the price action - DT, DB, 3U (triangle) and 123 entry. Or with a support of intermarket analysis, and more discretionary approach (this could also be a disadvantage). Also significant improvements could be done by using variable PT such as trailing SL, exiting at hi/lo of the day, exiting at the market structure etc. This all means many hours of analysing and further testing in real conditions. It has to be said that the CC logic proofed to be a strong element which can be further developed.

Not only to criticise, trading is not black and white. There is no „optimal“ strategy, or indicator or even holy grail. No strategy is perfect, and it always will be extremely emotionally difficult. That is only fact how the markets behave and also, why so many traders lose their money. Stop orders present extra stress, the same is with further profit targets. Always trader will be out of the trader because of one tick. This cannot be stopped. This can only be helped to prevent.

Another solution can be presenting a backup price action system, for further development.

The basic rules are following: It is traded always in the direction of the development on higher timeframes and waiting for formation of any of these situations expecting other traders to engage: 123 pattern, TR (trading range) and role reversal (flip). Then the entry is found on the 123 formation. For better timing smaller timeframe is used – 15,5,3,1 minute timeframes. RB 9 and 4 charts can also be used when the time based graphs are unclear. Important SR levels – yesterday close, today open, yesterday hi+low.

Price patterns

- TR – When the price breaks out the TR and then bounces of the TR line back to the suggested direction. The entry is with the stop order under/over the correction
- Breakout of the first correction on the 1 min. TF after the 123 formation on 3 or 5 minute timeframe. Ideally when price bounces of the top of the 123 formation – a RR is created. Entry is with the stop entry over/under the correction
- 123 Touch and go - The goal of the trend patterns is to catch the correction on the main TF of 3 minutes. If a beginning of a development of structure of the market is recognized in form of TR, 123 than it can be speculated to its continuation on lower timeframe. IF the market bounces of EMA on 3 min. TF and then returns back. The entry is the stop order under/over the top 2 of formation 123 on 1 minute or RB
- 123RR – breakout of mini 123 on RR on higher timeframes. If market breaks SR on 3,5 of 15 minute and then returns on RR. Entry is the stop order under/over top 2 of formation 123
- Counter trend pattern when the basic rules should be filled: the market already did a significant move without a correction on 1 min. TF. The market already did 3 and more corrections after the 123 formation on 3 min. The market did a significant move that represents a normal daily volatility.(more than 9 points). The market stopped on any type of SR for example any daily H/L from the past. Any open or a top of clear swing on 15 min. TF. When the formation looks better and clearer the probability is greater. If there is a mini 123 on 1 min. TF

and if there is a formation DT/DB on 3 and 5 minute TF. Stop entry is on the 123

- Breakout 123 on daily S/R or 15 min TF S/R. Stop entry on 123

Filtering

- The point of the filtration is to enter the traders only there where the most of the traders engage (those who use indicators). It is good to trade with other traders expectations
- Filtration of signals with EMA
- In graph are 3 basic EMAs – from the 3 minute TF, RB9 and 1 min. TF. The trade is entered only over/under 2 of these 3 EMAs
- MACD - It is only used as a trend determination. This only gives the information if the indicator traders are engaged. MACD is displayed on the 3 and 1 minute TF. The position is entered only when MACD is close to zero
- Filtration with help of potential – space from SR levels and against swings
- The entry to the trade has to be far enough to be able to have enough space for placing the PT to the nearest strong SR or against swing

Checklist to the system

- Is the pattern really nicely developed?
- Does the situation make sense on 3 and 5 min. TF and is it in the harmony with the structure development on these timeframes?
- How does the MACD look?
- What is the SL?
- What is the potential to SR and to High/Low of the swing against
- How many corrections has already developed
- Is the EMA situation clear?

SL is put on a logical point and when price is behind it, that means the end of a clear occasion. The SL is 2 tick behind a near SR level (usually about 12 tics). The level

van be High/low of a last candlebar in the direction of trade on 3 minute TF. Profit target is placed on a near SR level (usually 12-20 tics). The RRR is about 1,5.

This system is not about excel and backtesting but about experiencing it. Spending hundreds of hours in front of the screen and considering it more as an art. (JIM, 2011)

5 Conclusions

After acquainting with the theoretical resources of the work, mainly emphasis on various very important aspects of money management and technical analyses as well as the psychology of trading, is this knowledge used in the analytical part, which represents the main edge of this thesis. From the money management part the important challenge was noticing of the RRR rules. And from the topic of technical analyses the MACD indicator was considered as crucial. All this knowledge was further developed into many series of backtesting. This was done in order to develop a profitable and tradable strategy. Also an automated, computerized strategy backtesting was used.

This goal was achieved despite of the fact that some techniques showed as unsuccessful, namely – the pin bar and inside bar pattern. The analysis resulted in creation of very detailed trading plan which was prepared to be run on live trading. This strategy was also accompanied with many rules and features mainly for the trader's psychology, which was put on the first place. The most valuable part of the work represents the everyday live trading with the real account (not a demo version). Only this approach can really verify the functionality of each strategy, because only in this moment emotions truly step in the game.

According to the literature the success on the stock markets is 60% psychology, therefore this fact was seriously taken into account. And also important aspect were found out, such as significant distinction between backtest and live trading in terms of order filling. This issue was one of the causes of the below average result. The three month live trading ended with interesting results. The developed strategy made overall profit of 378 USD (excluding commissions – 125 USD). Another reason of this lower performance was that few of the trades were not according to the plan. The trade developed too quickly for the execution and the trader hesitated or one of the rules of the 100% trading plan discipline was broken and a loss occurred. Many further improvements were suggested to be further tested. This couldn't be reached without the live trading faze, that showed to be absolutely essential when developing a trading strategy. Because aspects collected will serve for further development.

In conclusion, after all, the task was completed, the profitable strategy for daytrading on e-mini markets was created and proven, however the live trading also showed much new knowledge and new topics for further testing and development. All of this shall be done in order to improve the results – increase the profit and built the strategy more stable with bigger number of trades. All the recommendation and information how, are included.

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7 List of abbreviations

CC – round number –(celé číslo – 800, 825, 830)

TF – The market E-mini Russell 2000

ES - The market S&P 500

PT – profit target

SL – stop loss

MACD - indicator of technical analyses (moving average convergence divergence)

BE – break even (point)

USD – united states dollar

DIV – divergence

RRR - risk reward ratio

MM - money management

SR - support/resistance

BT – backtest

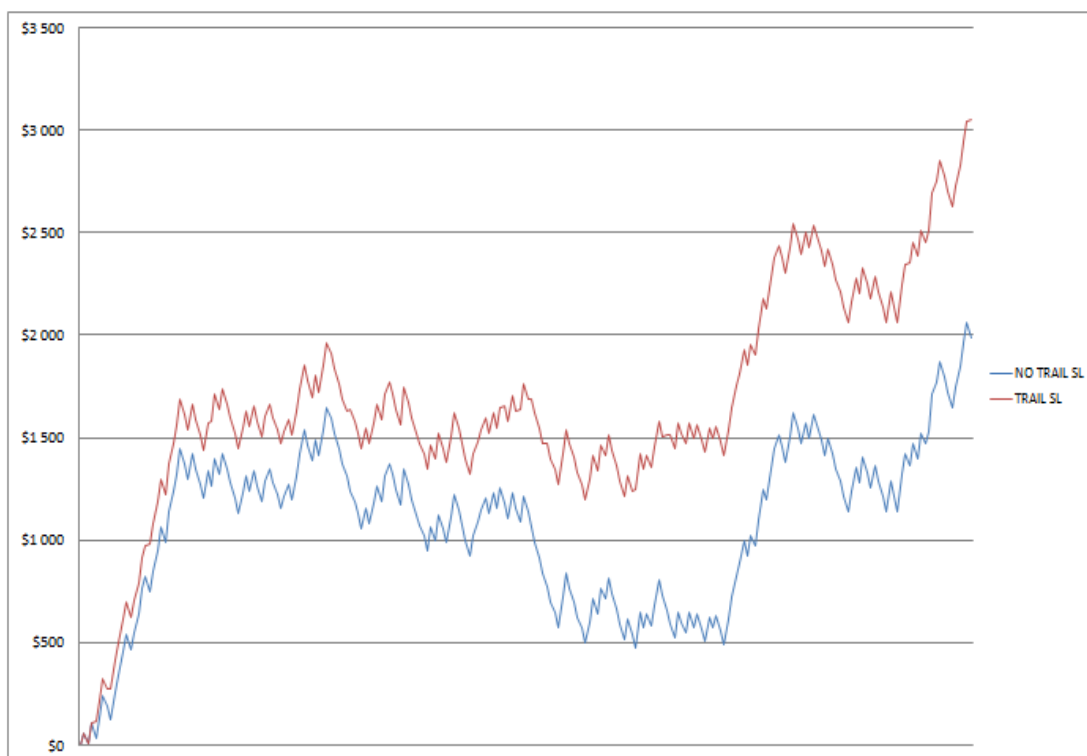
RR – role reversal

8 List of tables and charts

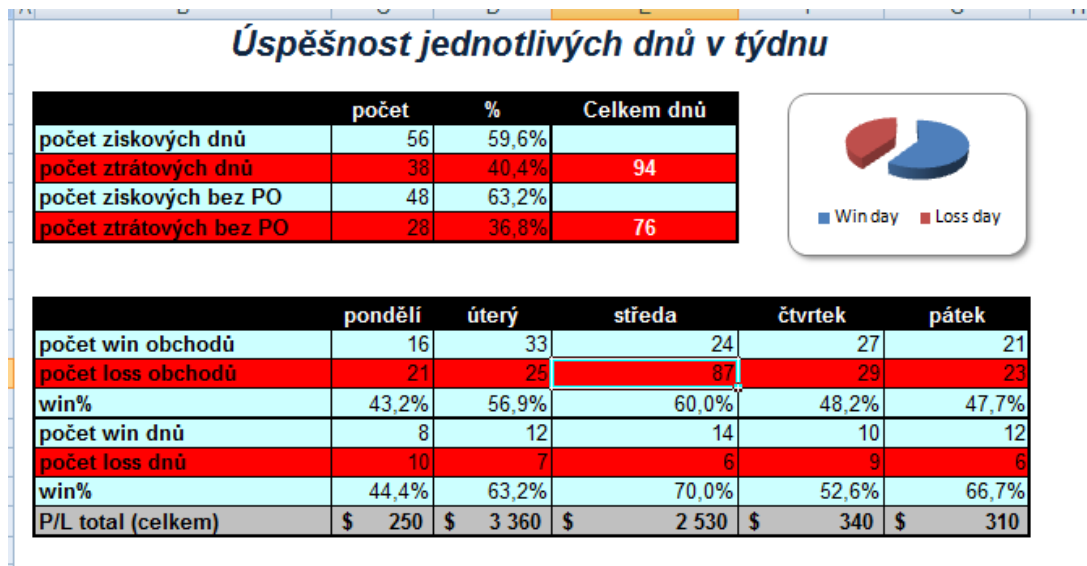
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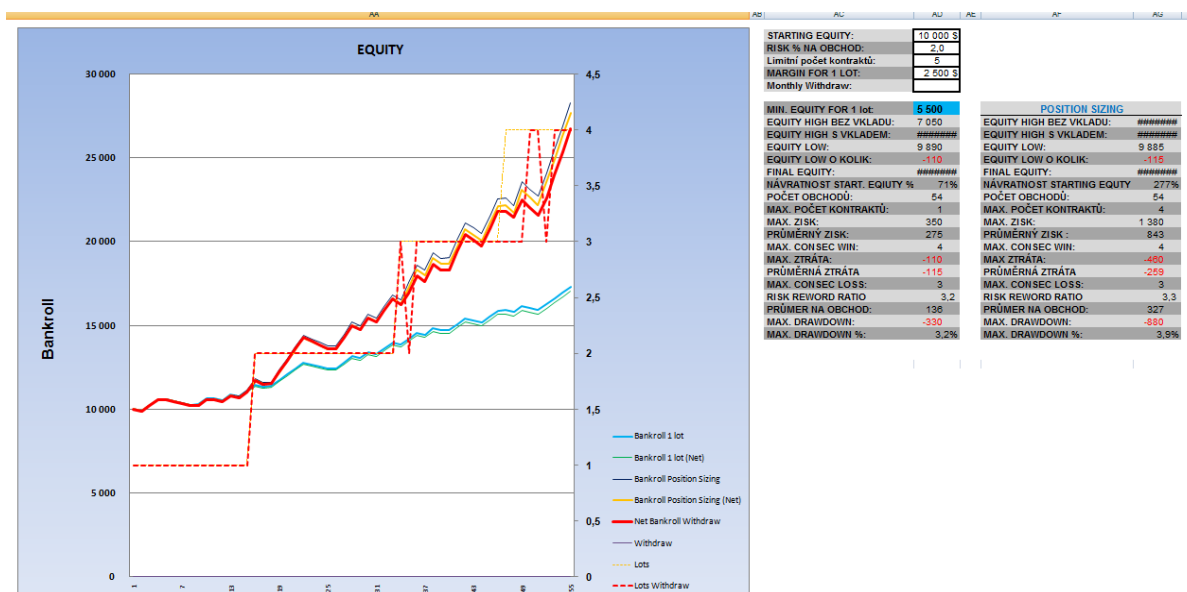
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Appendix 1-TF PIN Equity (created by author)

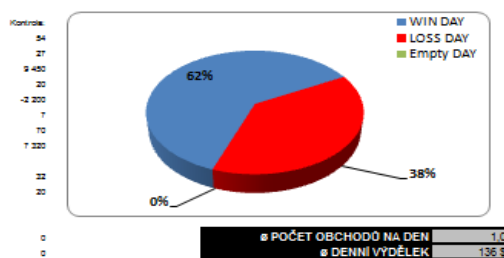


Appendix 2-TF- All patterns backtest- days of week (created by author)



Appendix 3- Yearly equity curve (created by author)

	pondělí	úterý	středa	čtvrtek	pátek
Celkem obchodů	12	14	9	7	12
PROFIT \$	6	5	6	4	4
PROFIT \$	2800	1750	2100	1400	1400
LOSS \$	3	6	2	3	5
LOSS \$	-330	-550	-220	-220	-770
BE	1	3	1	1	1
BE \$	10	30	10	10	10
TOTAL \$	2480	1120	1890	1190	640
% úspěšnosti	75.0%	57.1%	77.8%	71.4%	41.7%
Počet ziskových dnů	8	7	7	5	5
Počet ztrátových dnů	3	6	2	2	7
% ztrátových dnů	27%	46%	22%	29%	58%



	leden	únor	březen	duben	květen	červen	červenec	srpen	září	říjen	listopad	prosinec
Celkem obchodů	6	2	8	6	7	3	3	3	6	3	0	0
PROFIT	2	0	4	4	3	3	4	2	2	3	0	0
PROFIT \$	700	0	1400	1400	1050	1050	1400	700	700	1050	0	0
LOSS	3	1	3	1	3	2	3	1	3	0	0	0
LOSS \$	-330	-110	-330	-110	-330	-220	-330	-110	-330	0	0	0
BE	1	1	1	1	1	0	1	0	1	0	0	0
BE \$	10	10	10	10	10	0	10	0	10	0	0	0
TOTAL \$	380	-100	1080	1300	730	830	1080	590	380	1050	0	0
% úspěšnosti	50.0%	50.0%	62.5%	83.3%	57.1%	60.0%	62.5%	66.7%	50.0%	100.0%	0	0

STATISTIKA TÝDNŮ			
POŘADOVÉ ČÍSLO TÝDNE	POČET TRADŮ	ZISKOVATÁ	\$ na obchod
1			
2	1	-110	-110
3			
4	2	700	350
5	3	-210	-70
6	2	-100	-50
7			
8			
9			
10	4	690	150
11	1	-110	-110
12			
13	2	700	350
14	1	-110	-110
15	3	710	237

STATISTIKA TÝDNŮ	POČET TRADŮ	ZISKOVATÁ	€ na obchod
€ na týden	2	236	13
Maximum na týden	4	710	
Minimum na týden	1	-220	
CELKEM	54	7 320	15

Appendix 4- TF Yearly statistics (created by author)

Table 1
Stylized Trader Summary

This table summarizes the trading styles that traders use.

Stylized Trader	Description	Speed & Turnover	Trading Goal	Information Resources	Effect on Price Efficiency	Effect on Liquidity	Trading Style Profits from	Trading Style Loses to
Panel A: The winners. If skilled, these traders will profit from trading in the long run.								
Value-motivated traders Informed investors Stock pickers Asset allocators Value investors	Speculate on opinions about value obtained from analyses of micro- and macroeconomic fundamental information.	Slow acting. Low turnover.	Expected profits.	The available stock of fundamental valuation data rendered into information by analysis.	Cause prices to reflect fundamental values.	Supply depth to dealers and uninformed traders at the outside spread.	Uninformed traders	Informed traders with more current information. Value-motivated traders with superior analyses.
Informed traders Headline traders Event study traders Risk arbitrageurs Inside traders	Speculate on news, events, announcements, private information and inside information.	Fast acting. Turnover varies.	Expected profits.	Flow of new fundamental information about value.	Cause prices to adjust quickly to changes in fundamental values.	Demand liquidity, especially immediacy.	Dealers Uninformed traders Poorly informed value-motivated traders	Bluffers and market manipulators (if trading on rumors.)
Market-makers Dealers Scalpers Day traders	Speculate on finding a balanced order flow to trade both sides of the bid/ask spread.	Fast acting. High turnover.	Expected profits.	Current and recent order flow, often identified by broker but not by source.	Discover prices that produce balanced order flow.	Supply immediacy at the inside bid/ask spread.	Impatient, uninformed traders	Informed traders
Upstairs traders Block positioners Block facilitators	Facilitate, position or arrange large trades. Speculate on placing large blocks.	Moderate speed. Turnover varies.	Expected profits.	Audits of initiating trader motives. Information about latent trading interests.	Discover prices that produce balanced trading interest.	Supply market depth, especially for uninformed traders.	Impatient, uninformed traders	Informed traders
Parasitic traders Quote-matchers Front-runners	Trade in front of orders and quotes to obtain the option value of the order flow.	Fast acting. Turnover varies.	Expected profits.	Current and impending order flow.	Long-run effect uncertain. In short-run, prices may adjust faster to information in the order flow.	Effect depends on market structure. Probable long-run negative effect on depth and short-run positive effect on spreads.	Large, slow traders Stale limit order traders Market-makers Upstairs traders	Informed traders Bluffers and manipulators

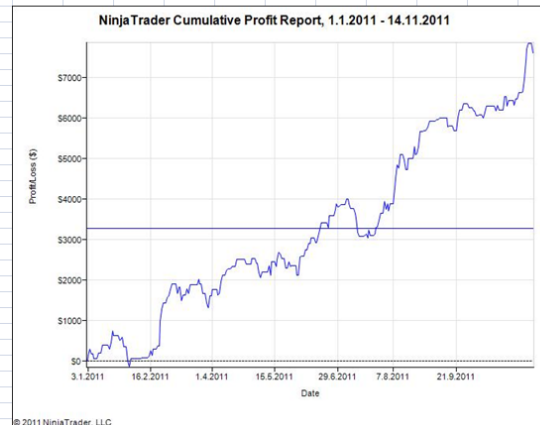
(continued)

Source: Lawrence Harris, "The Winners and Losers of the Zero-Sum Game: The Origins of Trading Profits, Price Efficiency and Market Liquidity"

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Appendix 7- Market subjects

Performance	All Trades	Long Trades	Short Trades
Total Net Profit	\$7810.00	\$4020.00	\$3590.00
Gross Profit	\$25280.00	\$12750.00	\$12530.00
Gross Loss	\$-17870.00	\$-8730.00	\$-8940.00
Commission	\$0.00	\$0.00	\$0.00
Profit Factor	1.43	1.46	1.40
Cumulative Profit	\$7810.00	\$4020.00	\$3590.00
Max. Drawdown	\$-1110.00	\$-900.00	\$-1290.00
Sharpe Ratio	0.87	0.79	0.61
Start Date	1.1.2011		
End Date	14.11.2011		
Total # of Trades	318	159	159
Percent Profitable	53.14%	53.46%	52.83%
# of Winning Trades	169	85	84
# of Losing Trades	149	74	75
Average Trade	\$23.93	\$25.28	\$22.58
Average Winning Trade	\$149.59	\$150.00	\$148.17
Average Losing Trade	\$-118.59	\$-117.97	\$-119.20
Ratio avg. Win / avg. Loss	1.26	1.27	1.25
Max. consec. Winners	10	6	9
Max. consec. Losers	7	5	7
Largest Winning Trade	\$150.00	\$150.00	\$150.00
Largest Losing Trade	\$-120.00	\$-120.00	\$-120.00
# of Trades per Day	1.00	0.50	0.50
Avg. Time in Market	6.3 min	6.9 min	5.7 min
Avg. Bars in Trade	2.2	2.3	2.1
Profit per Month	\$734.51	\$388.01	\$347.60
Max. Time to Recover	33.90 days	100.03 days	87.03 days
Average MAE	\$77.52	\$78.30	\$76.73
Average MFE	\$100.35	\$101.07	\$99.62
Average ETD	\$76.42	\$75.79	\$77.04



Appendix 8- Inside bar statistics (created by author)

Datum	Levá noha	Pravá noha	Směr	Tick	Nad 0		Směr cen	DIV vrcholů	Prudký pol	Extrém swingu	před divergen	Čas vstupu	Čas výstupu	Vstup	Limit na CC		MAE	MFE	PT	PT/S
					0,1	1									SL	1				
				####													0.8	0.5	1.7	2.4
7.2.2011	154800	160500	-1	1 1700	1	1	1	1	0	808,8	1,3	161200	161900	807,5	808,5	1 808	0,1	807	1 805	2,1 -10
7.2.2011	154800	162000	-1	1 3800	1	1	1	1	0	811,1	1,1	163500	163900	810	811	1 810	0,3	810	0,5	808 2,1 -50
10.2.2011	151000	160200	-1	1 6200	-1	1	-1	1	1	802,4	5,1	161400	161900	807,5	806,5	1 807	0,2	812	4	810 2,1 210
10.2.2011	162000	165000	-1	1 3000	1	1	1	1	0	811,5	1,5	165500	170900	810	811	1 810	0	808 1,9	808	2,1 10
14.2.2011	162100	163600	-1	1 1500	1	1	1	1	1	825,3	2,8	164700	165900	822,5	823,5	1 823	0,2	822	0,6	820 2,1 30
15.2.2011	154900	160200	-1	1 1300	1	1	1	1	0	824,3	1,8	160800	162900	822,5	823,5	1 823	0,1	820 2,9	820	2,1 210
16.2.2011	153000	155300	1	1 2300	-1	1	-1	1	1	822,3	2,7	160300	160400	825	824	1 824	1	825	0	827 2,1 -100
22.2.2011	160300	161700	-1	1 1400	1	1	1	1	0	830,4	2,9	162400	163000	827,5	828,5	1 828	0,1	823 4,3	825	2,1 210
22.2.2011	154500	163500	1	1 5000	-1	1	-1	1	0	823,2	1,8	164100	164700	825	824	1 824	0,6	829 3,5	827	2,1 210
23.2.2011	142900	154500	-1	1 7600	-1	-1	1	1	1	814,5	4,5	155000	155400	810	811	1 811	0,7	806 3,8	808	2,1 -50
24.2.2011	153500	164800	1	1 7300	-1	1	-1	1	0	801	1,5	165300	165800	802,5	801,5	1 802	0,1	804	1,7	805 2,1 10
28.2.2011	154100	160600	-1	1 2500	1	-1	1	1	1	827,6	2,6	161400	161600	825	826	1 825	1	825	0	823 2,1 -100
3.3.2011	161800	162900	-1	1 1100	1	1	1	1	0	824,2	1,7	163300	163400	822,5	823,5	1 823	0,7	823	0	820 2,1 -50
8.3.2011	145100	153300	-1	1 4200	1	1	1	1	1	812,6	2,9	153700	154200	810	811	1 811	0,7	806 4,5	806	2,1 -50
9.3.2011	142200	163100	-1	0 12900	1	-1	1	0	0	825,2	2,7	166200	165500	822,5	823,5	1 823	0,5	815 4,6	820	2,1 210
10.3.2011	154200	160900	1	1 2700	-1	-1	-1	1	1	796,8	3,2	162600	162700	800	799	1 799	1	800	0	802 2,1 -100
11.3.2011	151000	161000	1	1 6000	-1	1	-1	1	1	791,1	3,9	162000	162200	795	794	1 794	0,6	796 0,9	797	2,1 -50
11.3.2011	161100	164600	1	1 3500	-1	-1	-1	0	0	790,7	1,8	164900	165200	792,5	791,5	1 792	0,5	793 0,7	795	2,1 -50
14.3.2011	143000	153500	1	1 6500	-1	1	-1	0	0	792,3	2,7	155100	155700	795	794	1 795	0,2	797 1,9	797	2,1 10
15.3.2011	153300	154500	-1	1 1200	1	1	1	0	0	784,4	1,9	160400	161600	782,5	783,5	1 783	0	781 1,3	780	2,1 10
16.3.2011	152700	153800	1	1 1100	1	1	-1	0	0	789,6	2,9	154900	155200	792,5	791,5	1 792	0,1	794 1,1	795	2,1 -10
5.4.2011	154300	160900	1	1 2600	-1	1	-1	1	1	845	2,5	161700	162700	847,5	846,5	1 847	0,9	856 8,2	850	2,1 210
6.4.2011	105600	162100	1	0 32500	-1	1	-1	0	0	854	1	162500	163700	855	854	1 855	0,3	857 1,9	867	2,1 10
8.4.2011	160200	161700	-1	1 1500	-1	-1	1	1	1	849,9	2,4	162000	163700	847,5	848,5	1 848	0,2	846 2	845	2,1 20
13.4.2011	132800	153400	-1	0 12600	1	1	1	0	0	827,1	2,1	154100	154100	825	826	1 825	1	825	0	823 2,1 -100
13.4.2011	123900	155100	1	0 19200	-1	1	-1	0	0	824,2	0,8	155600	155700	825	824	1 824	0,6	825	0	827 2,1 -60
14.4.2011	103700	154200	-1	6 30500	1	-1	1	1	1	815,4	3,4	155100	155100	815	816	1 815	1	815	0	813 2,1 -100
15.4.2011	143900	151800	-1	1 3900	1	1	1	0	0	826,9	1,9	153500	155700	825	826	1 825	0,2	822 3,4	823	2,1 210
18.4.2011				1 0																
19.4.2011	150800	153000	1	1 2200	-1	-1	-1	1	1	822,4	2,6	153700	153800	825	824	1 824	0,8	825	0	827 2,1 -20
20.4.2011	143600	153300	-1	1 6700	1	1	1	0	0	836,1	3,6	155400	155600	832,5	833,5	1 833	0,7	832 0,9	830	2,1 -40
25.4.2011	111000	160200	-1	0 29200	1	-1	1	1	1	844,6	2,1	160800	161600	842,5	843,5	1 843	0,3	841 1,1	840	2,1 -50
26.4.2011	92400	154100	1	0 37700	-1	1	-1	0	0	842,7	2,3	155200	155400	845	844	1 845	0,1	856 11	847	2,1 210
27.4.2011	116700	155600	-1	0 23900	1	1	1	1	1	853	3	160600	162000	850	851	1 851	0,5	849 1,5	848	2,1 80
27.4.2011	162200	163600	1	1 1400	-1	-1	-1	0	0	848,2	1,8	164800	165000	850	849	1 849	1	850	0	852 2,1 -100
29.4.2011	150200	153100	1	1 2900	-1	-1	-1	1	1	860,2	2,3	153800	154000	862,5	861,5	1 862	0,7	864 1,1	865	2,1 -30
29.4.2011	104900	160500	1	0 31600	-1	1	-1	0	0	858,6	1,4	163800	164100	860	859	1 860	0,1	860 0,4	862	2,1 10
5.5.2011	113200	160800	-1	0 27600	1	-1	1	1	1	831,6	4,1	162000	162200	827,5	828,5	1 828	0,1	827 0,4	825	2,1 -100
6.5.2011	163500	164900	-1	1 7400	1	-1	1	1	1	840	2,5	166800	170200	837,5	838,5	1 838	0,5	837 0,2	835	2,1 -100
9.5.2011	154400	164500	1	1 2100	1	1	-1	0	0	830,3	2,2	160800	161100	832,5	831,5	1 832	0,2	835 2,9	835	2,1 210

Appendix 9- TF DIV backtest (created by author)

Table 1, Continued									
Stylized Trader	Description	Speed & Turnover	Trading Goal	Information Resources	Effect on Price Efficiency	Effect on Liquidity	Trading Style Profits from	Trading Style Loses to	
Panel A, Continued: The winners. If skilled, these traders will profit from trading in the long run.									
Electronic proprietary traders	Trade inventory to enforce regularity constraints on the supply of liquidity using fast models with wide scope.	Fast acting. High turnover.	Expected profits.	Short-term electronic transaction and quote histories interpreted in context of long-run regularities.	Increase efficiency by eliminating transitory volatility and stale prices.	Supply liquidity when eliminating transitory volatility. Take liquidity when eliminating stale prices.	Inattentive dealers Impatient traders	Informed traders Bluffers and manipulators	
Pure arbitrageurs Index enhancers	Lock-in price discrepancies among instruments for which physical or institutional processes imply a stable price relation.	Fast acting. Turnover varies.	Expected profits.	Current prices and quotations.	Increase efficiency by maintaining a single price for related risks.	Move liquidity among market segments.	Dealers Impatient uninformed traders State limit order traders	Informed traders if caught with one leg up. Value-motivated traders if arbitrageurs do not understand the pricing relation.	
Statistical arbitrageurs Pairs traders	Speculate on price discrepancies among instruments or baskets whose prices are correlated due to common fundamental factors.	Fast acting. High turnover.	Expected profits.	Current quotes and historic price relations.	Increase efficiency by obtaining a single price for common factor risks.	Move liquidity among market segments.	Dealers Impatient uninformed traders State limit order traders	Informed and value-motivated traders acting on instrument specific information.	
Technical traders Chartists Contrarians Momentum and trend traders	Trade on various systematic price, order flow and volume patterns.	Speed varies. Turnover varies.	Expected profits.	Price, order flow and volume histories.	Increase efficiency when countering predictable patterns. Decrease efficiency when exacerbating uninformed order flows.	Increase liquidity if contrarian. Decrease liquidity if trading with the trend.	Dealers Uninformed traders	Value-motivated traders Informed traders Bluffers	
Bluffers Market manipulators "Pure" traders	Fool other traders into offering liquidity at disequilibrium prices.	Generally slow acting. Turnover varies.	Expected profits.	The relation between one's own order flow and past price changes. Rumors.	Decrease efficiency.	Take liquidity.	Uninformed traders Momentum traders	Value-motivated traders Contrarians Statistical arbitrageurs Dealers Other bluffers	

(continued)

Source: Lawrence Harris, "The Winners and Losers of the Zero-Sum Game: The Origins of Trading Profits, Price Efficiency and Market Liquidity"

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Appendix 10- Market subjects B

[illegible]

4.8.11	2E+05	1	-1	757	759	1248	1,3	0	1	757,5	758,6	1,1	759	1,1	758	0	755	2,5	-110
4.8.11	2E+05	2	1	752	754	1450	1,9	1	1			0							0
5.8.11	2E+05	1	1	729	730	1570	1,8	0	1	730	728,5	1,5	729	1,5	730	0	733	2,5	-150
5.8.11	2E+05	1	-1	730	731	1013	1	1	1	730	730,6	0,6	730	0,1	706	24,5	728	2,5	250
5.8.11	2E+05	1	1	705	709	2424	3,6					0							0
5.8.11	2E+05	1	1	713	716	1760	3,1					0							0
5.8.11	2E+05	1	-1	715	716	1227	1,6	0	1			0							0
8.8.11	2E+05	1	-1	697	699	2165	1,3	0	1	697,5	698,6	1,1	699	1,1	698	0	695	2,5	-110
8.8.11	2E+05	2	1	697	699	2108	1,9	0	1			0							0
8.8.11	2E+05	1	1	698	700	1664	2,1	0	1	700	698,2	1,8	700	0,5	703	3,1	703	2,5	250
8.8.11	2E+05	2	-1	697	701	1444	4,4					0							0
8.8.11	2E+05	1	1	697	699	898	2,3	0	0			0							0
9.8.11	2E+05	1	-1	659	660	1900	1,9	1	1	660	660,5	0,5	661	0,5	660	0	658	2,5	-50
9.8.11	2E+05	1	-1	664	668	1716	3,6					0							0
9.8.11	2E+05	1	1	662	666	1773	3,9					0							0
9.8.11	2E+05	1	1	662	664	1715	2,2	0	1	662,5	661,5	1	662	0,5	675	12,4	665	2,5	250
9.8.11	2E+05	1	-1	662	664	1506	2,3	1	1	662,5	664,5	2	665	2	663	0	660	2,5	-200
9.8.11	2E+05	1	1	662	664	1113	1,8	0	0			0							0
9.8.11	2E+05	1	-1	667	669	1242	1,5	0	1	667,5	668,9	1,4	668	0,4	664	4	665	2,5	250
10.8.11	2E+05	1	-1	676	679	1665	3,1	1	1			0							0
10.8.11	2E+05	1	-1	671	673	1906	2	0	1	672,5	673,3	0,8	673	0,8	673	0	670	2,5	-80
10.8.11	2E+05	2	1	671	674	1601	2,7	1	1	672,5	670,9	1,6	672	0,1	676	3,5	675	2,5	250
10.8.11	2E+05	1	-1	674	676	1196	2,3	0	1			0							0
11.8.11	2E+05	1	1	663	666	1210	2,9	0	1	665	662,7	2,3	665	0,4	672	6,7	668	2,5	250
11.8.11	2E+05	2	-1	667	672	1138	4,3					0							0
11.8.11	2E+05	2	-1	678	678	652	1,9	1	1			0							0
12.8.11	2E+05	1	-1	690	692	808	2,1	0	1	690	691,8	1,8	690	0,4	687	3,5	688	2,5	250
15.8.11	2E+05	1	1	707	709	941	2,5	0	1	707,5	706,5	1	707	0,7	710	2,8	710	2,5	250
15.8.11	2E+05	1	-1	707	709	551	1,2	0	1	707,5	708,6	1,1	709	1,1	708	0	705	2,5	-110
16.8.11	2E+05	1	1	704	707	2859	2,9	0	1	705	703,5	1,5	704	1,5	706	0,5	708	2,5	-150
16.8.11	2E+05	1	1	702	704	616	2	1	0	702,5	701,7	0,8	702	0,5	705	2,3	705	2,5	-80
17.8.11	2E+05	1	-1	710	711	830	1	1	1	710	710,6	0,6	710	0,1	707	2,6	708	2,5	250
18.8.11	2E+05	1	1	678	681	2284	2,6	1	0	680	678,2	1,8	678	1,8	680	0	683	2,5	-180
18.8.11	2E+05	2	-1	678	681	1412	3,2					0							0
18.8.11	2E+05	2	1	678	676	1351	1,7	1	1			0							0
18.8.11	2E+05	1	-1	671	674	725	2,5	1	0	672,5	674	1,5	673	0,6	668	4,7	670	2,5	250
19.8.11	2E+05	1	1	664	666	589	2,1	0	1	665	663,4	1,6	663	1,6	665	0	668	2,5	-160
19.8.11	2E+05	1	1	664	665	348	0,9	1	1			0							0
22.8.11	2E+05	1	-1	661	663	597	1,9	0	1	662,5	663,4	0,9	663	0,2	656	6,1	660	2,5	250
23.8.11	2E+05	2	1	651	653	867	2,2	1	1			0							0
23.8.11	2E+05	1	-1	660	661	307	0,9	0	1	660	660,7	0,7	661	0,7	660	0	658	2,5	-70
24.8.11	2E+05	1	-1	687	688	314	1	0	1	687,5	687,9	0,4	688	0	686	1,5	685	2,5	-40
24.8.11	2E+05	1	-1	684	686	568	1,7	1	1			0							0
25.8.11	2E+05	1	1	691	693	1113	1,5	0	1	692,5	691,1	1,4	691	1,4	693	0	695	2,5	-140
25.8.11	2E+05	2	-1	691	693	1039	2,4	1	1			0							0
25.8.11	2E+05	1	-1	689	691	793	2,3	1	1			0							0
25.8.11	2E+05	1	1	677	678	910	1,3	0	1	677,5	676,6	0,9	677	0,6	679	1,9	680	2,5	-90
25.8.11	2E+05	1	1	678	678	481	1,6	1	1	677,5	676,2	1,3	677	0,5	685	7,2	680	2,5	250
26.8.11	2E+05	2	-1	668	672	1462	4,1					0							0
26.8.11	2E+05	1	1	674	676	732	1,8	0	1	675	673,9	1,1	674	1,1	675	0	678	2,5	-110
26.8.11	2E+05	1	1	677	678	1225	1,6	0	1	677,5	676,5	1	678	0	678	0	680	2,5	-100
29.8.11	2E+05	1	-1	704	706	723	2	0	1	705	705,6	0,6	706	0,6	705	0	703	2,5	-60
29.8.11	2E+05	1	1	707	708	621	1,3	0	1			0							0
29.8.11	2E+05	1	-1	707	708	289	1	1	0	707,5	708,2	0,7	708	0,5	706	2	705	2,5	-70
30.8.11	2E+05	1	-1	712	713	957	1,8	0	1	712,5	713,5	1	714	1	713	0	710	2,5	-100
30.8.11	2E+05	1	1	711	714	848	2,5	1	1			0							0
30.8.11	2E+05	1	-1	714	716	736	2,2	1	1	715	716,4	1,4	716	1,3	715	0	713	2,5	-140
31.8.11	2E+05	1	1	732	734	693	1,5	0	1			0							0
1.9.11	2E+05	2	-1	729	731	528	1,7	0	1	730	730,9	0,9	731	1	730	0,2	728	2,5	-90
1.9.11	2E+05	2	-1	727	728	249	1,5	0	1			0							0
2.9.11	2E+05	1	1	695	696	495	1,5	1	1			0							0
2.9.11	2E+05	2	1	692	693	519	1	0	1	692,5	691,8	0,7	692	0,7	693	0	695	2,5	-70
6.9.11	2E+05	2	1	662	663	538	1,5	1	1			0							0
6.9.11	2E+05	1	1	662	663	539	1,1	1	0			0							0
7.9.11	2E+05	1	1	689	691	805	1,7	0	0	690	689,3	0,7	689	0,6	699	8,8	693	2,5	250
8.9.11	2E+05	2	1	702	703	149	1,4	1	1			0							0
8.9.11	2E+05	2	-1	705	706	220	1	0	1	705	705,9	0,9	706	0,9	705	0	703	2,5	-80
9.9.11	2E+05	1	-1	685	686	485	1,3	0	1	685	686,1	1,1	685	0,2	680	4,7	683	2,5	250
12.9.11	2E+05	1	1	666	668	1242	1,8	0	1	667,5	666,3	1,2	667	0,8	677	9,9	670	2,5	250
13.9.11	2E+05	1	-1	679	681	1541	1,5	1	1			0							0
13.9.11	2E+05	1	1	676	679	879	2,1	0	1			0							0
13.9.11	2E+05	1	-1	686	688	388	1,7					0							0
14.9.11	2E+05	1	-1	687	689	289	1,8	1	1			0							0
14.9.11	2E+05	1	-1	684	686	863	1,6	0	1	685	686	1	685	0,3	682	2,9	683	2,5	250
14.9.11	2E+05	2	1	682	684	627	2,5					0							0
15.9.11	2E+05	2	1	703	706	1122	3,6					0							0
16.9.11	2E+05	2	-1	713	716	1497	3,4					0							0
16.9.11	2E+05	1	-1	712	713	385	1,3	0	1	712,5	713,5	1	714	1	712	0,2	710	2,5	-100
21.9.11	2E+05	1	-1	687	689	398	1,7	1	0			0							0
22.9.11	2E+05	1	1	639	641	985	1,5	1	1			0							0
23.9.11	2E+05	2	1	641	644	990	2,7	0	1	642,5	641	1,5	641	1,5	643	0	645	2,5	-150
26.9.11	2E+05	2	-1	651	654	408	2,5	0	0	652,5	654	1,5	653	0,8	651	1,4	650	2,5	-150
26.9.11	2E+05	1	-1	651	653	340	2,1	1	0	652,5	651,1	1,4	651	1,4	652	-0,3	655	2,5	-140
26.9.11	2E+05	1	-1	647	649	588	2,2	0	1	647,5	649,1	1,6	648	0,5	640	7,3	645	2,5	250
26.9.11	2E+05	2	-1	644	646	1110	2,1												

Appendix 11- TF PIN stats. 2 (created by author)

Exchange	IB Underlying	Product description	Trading Class	Intraday Initial ⁽¹⁾	Intraday Maintenance ⁽¹⁾	Overnight Initial	Overnight Maintenance	Currency
NYBOT	CC	Cocoa NYBOT	CC	1563	N/A	1563	1250	USD
NYBOT	CI	Continuous Commodity Index	CI	18250	N/A	18250	14600	USD
NYBOT	CRY	Reuters Jefferies CRB INDEX	CR	1625	N/A	1625	1300	USD
NYBOT	CT	Cotton No. 2	CT	3150	N/A	3150	2520	USD
NYBOT	DX	NYBOT US Dollar FX	DX	1950	N/A	1950	1560	USD
NYBOT	KC	Coffee "C"	KC	4875	N/A	4875	3900	USD
NYBOT	OJ	FC Orange Juice "A"	OJ	2188	N/A	2188	1750	USD
NYBOT	RLG	Russell 1000 Growth Index	RG	2500	N/A	2500	2000	USD
NYBOT	RLV	Russell 1000 Value Index	RV	2500	N/A	2500	2000	USD
NYBOT	RYO	Russell 1000 Index	RF	3750	N/A	3750	3000	USD
NYBOT	SB	Sugar No. 11	SB	1787	N/A	1787	1430	USD
NYBOT	SF	Sugar #16 112000 lbs	SF	2000	N/A	2000	1600	USD
NYBOT	TF	Russell 2000 Mini Futures	TF	3750	3000	7500	6000	USD
NYBOT	ZC	Corn Futures	ICN	2625	N/A	2625	2100	USD
NYBOT	ZL	Soybean Oil Futures	IBO	3125	N/A	3125	2500	USD
NYBOT	ZM	Soybean Meal Futures	ISM	5500	N/A	5500	4400	USD
NYBOT	ZS	Soybean Futures	IS	4375	N/A	4375	3500	USD
NYBOT	ZW	Wheat Futures	IW	3438	N/A	3438	2750	USD

Appendix 12- IB Margins (www.interactivebrokers.com)