

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



Diploma Thesis

Chosen Currency Analysis

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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DIPLOMA THESIS ASSIGNMENT

Bc. Oleksandra Silantieva

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Thesis title

Chosen Currency Analysis

Objectives of thesis

The main objective of the diploma thesis “Chosen Currency Analysis” is to evaluate behavior of euro in the past and current positions of euro on the stock market. Suggestions for investors are created based on the obtained results. This work represents the implementation of both, technical and fundamental analysis on currency pair EUR/USD. The received results from fundamental analysis are compared with technical results and others investors’ expectations.

Methodology

The theoretical part of this diploma thesis is based on the study of relevant literature. The empirical part contains statistical analysis, fundamental analysis and technical analysis constructed from the latest available dataset. The results are then compared and evaluated.

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6/2016 – 9/2016 – finalizing of the theoretical part

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Keywords

currency, euro, analysis, stock exchange, central bank

Recommended information sources

- Garner, Carley. Currency trading in the forex and futures markets. Upper Saddle River, N.J.: FT Press, 2012. ISBN 978-0-132-931-373.
- Gunye, Serge K. The Euro: a currency of 300 million people. Hauppauge, N.Y.: Novinka Books, 2004. ISBN 159-0-339-088.
- Lien, Kathy. Forex: Day Trading and Swing Trading the Currency Market: Technical and Fundamental Strategies to Profit from Market Moves. 2nd ed. John Wiley & Sons, 2015. ISBN 978-80-904418-2-8.
- Michael D. Archer. Getting Started in Currency Trading Winning in Today's Forex Market. 4th ed. Hoboken: Wiley [Imprint], 2012. ISBN 978-1-118-281-987.
- Rosenberg, Michael R. Currency Forecasting: A Guide to Fundamental and Technical Models of Exchange Rate Determination. Chicago, IL: Irwin Professional Pub., 1996. Print. ISBN 1-55738-918-7.
- Sarno, Lucio, and Taylor, Mark P. The Economics of Exchange Rates. Cambridge, UK: Cambridge UP, 2002. Print. ISBN 978-0-521-4854-3.
- Sether, Laura. Technical Analysis. W&A Publishing, 2007. Print. ISBN: 978-1-934-354-018
- Schlossberg, Boris. Technical Analysis of the Currency Market Classic Techniques for Profiting from Market Swings and Trader Sentiment. Hoboken: John Wiley & Sons, 2006. ISBN 9780471973065.
- Weisweiler, Rudi. Introduction to Foreign Exchange. Cambridge, England: Woodhead-Faulkner, 1984. Print. ISBN-13: 978-0-85-941286-5.
- Williamson, John, ed. Estimating Equilibrium Exchange Rates. Washington, DC: Institute for International Economics, 1994. Print. ISBN 0-88132-076-5.
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Declaration

I declare that I have worked on my diploma thesis titled "Chosen Currency Analysis" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 24th March 2017

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Analýza vybrané měny

Souhrn

V této diplomové práci je zkoumána perspektiva vývoje měnového páru EUR/USD pomocí nástrojů technické a fundamentální analýzy. Teoretická část práce je zaměřená na vysvětlení základních pojmů používaných na trhu Forex. Mimo jiné, v této práci jsou vysvětleny specifické vlastnosti trhu Forex a jeho rozvoj v čase. V druhé polovině teoretické části jsou znázorněny významné historické události, které ovlivnily současnou cenu eura vůči americkému dolaru a dalším měnám.

Praktická část práce vysvětluje nástroje technické a fundamentální analýzy a také jejich konkrétní využití při prognóze budoucího vývoje EUR/USD. Nástroje technické analýzy zahrnují využití grafické analýzy a trendových indikátorů. Fundamentální část analýzy zkoumá současné a budoucí ekonomické nebo politické události, intervence Federálního Systému a Evropské Centrální Banky a případně jejich možný dopad na investory. Prognózy budoucího vývoje měnového páru jsou formulované na základě porovnání výsledků všech indikátorů.

Klíčová slova: měna, Euro, fundamentální analýza, technická analýza, Forex, Fibonacci, indikátor, broker, U.S dollar.

Chosen Currency Analysis

Summary

The purpose of this thesis is to analyze prospects of future development for currency pairing of EUR/USD through the tools of technical and fundamental analysis. The theoretical part of the thesis is focused on the description of main definitions, which are used on the Forex market. Furthermore, specific characteristics of the Forex market and its improvements are interpreted. The second part of theoretical study represents historical events, which had an impact on the current price of the Euro against the dollar and other currencies.

The practical part of the diploma defines tools of technical and fundamental analysis and their concrete implementation on the prognosis of future EUR/USD price developments. Instruments of technical analysis include graph analysis and implementation of trend indicators. Fundamental analysis is investigating current or future economic and political events, interventions executed by the Federal Reserve System and European Central Bank and their possible effect on investors. These prognoses of feasible EUR/USD price developments are based on the comprising of results from all indicators.

Keywords: currency, Euro, fundamental analysis, technical analysis, Forex, Fibonacci, indicator, broker, U.S dollar.

Table of content

List of appendicies	9
1. Introduction	10
2. Objectives and Methodology	12
2.1 Objectives	12
2.2 Methodology	13
3. Literature Review	14
3.1 Forex	14
3.1.1 Main definitions.....	14
3.1.2 Participants	16
3.1.3 Historical events	18
3.1.4 Implementation of Euro.....	29
3.1.5 U.S Dollar.....	31
3.1.6 Forex now	37
3.1.7 Characteristics of currency pairs on Forex	41
3.2 Types of analysis	48
3.2.1 Technical analysis	49
3.2.2 Fundamental analysis	50
3.3 Limitation of prognosis.....	52
4. Practical Part	54
4.1 Technical analysis.....	54
4.1.1 Chart analysis	54
4.1.2 Trend.....	57
4.1.3 Fibonacci Indicator	63
4.1.4 ADX	69
4.2 Fundamental analysis.....	72
4.2.1 Open market operations.....	73
4.2.2 GDP	75
4.2.3 Unemployment	76
4.2.4 Political situation Political and social overview.....	77
5. Conclusion	80
6. References	83
7. Appendix	86

List of figures

Figure 1 U.S Dollar Weighted Index from 1980 till 2016	22
Figure 2 Bilateral U.S Dollar Exchange Rates	24
Figure 3 Currency Snake	26
Figure 4 Share of Euro in international monetary system, %	31
Figure 5 Foreign Exchange market turnover by currency pairs	39
Figure 6 EUR/CHF exchange rates from January 2012 until January 2016	40
Figure 7 EUR/USD from January 2015 till January 2017, annual bid.....	41
Figure 8 USD/JPY quotation from 10th February, 2017 on 10 minutes bid.....	43
Figure 9 Comprising of EUR/USD and GBP/USD, daily bid	44
Figure 10 EUR/USD and USD/CHF from December 2016 till February 2017.....	46
Figure 11 NZD/USD and AUD/USD from November till February 2017	47
Figure 12 Line chart EUR/USD from January till February 2017, day bid	54
Figure 13 Bar chart EUR/USD from January till February, 2017, day bid.....	55
Figure 14 Candlestick chart EUR/USD from January till February 2017, day bid....	56
Figure 15 EUR/USD chart, month bid from 2014 till February 2017	58
Figure 16 EUR/USD chart, month bid from September 2012 till February 2017	65
Figure 17 Fibonacci Time Zones on EUR/USD chart, monthly bid	68
Figure 18 Implementation of ADX Indicator on EUR/USD chart, monthly bid	71

List of appendices

Appendix 1 Corvengance criteria.....	86
Appendix 2 Foreign exchange turnover by currency pair	87
Appendix 3 Foreign exchange turnover by location	88
Appendix 4 Foreign exchange turnover in % by currency.....	89
Appendix 5 Forecast of economic performance for winter 2017	90

1. Introduction

The Forex exchange market has gained great popularity since it went through the significant structural changes during the past century and became an accessible market for individual investors. The mentioned change increased the number of market participants rapidly and makes prognosis a complex process. Forex has various characteristics, which significantly distinguish it from other markets. Because of competition and the evolution of foreign exchange, the world's financial markets have developed accordingly. It is a system of decentralized markets with a few economical centres connected by modern technologies and trading platforms. The foreign exchange market provides the same information to all participants at the same time though the brokerage companies.

Foreign exchange is a fast growing market for trading currencies with daily volumes ranging between 4-5 trillion U.S dollars. The biggest currency transactions, regarding volume of transactions per day, accrues between the U.S dollar and four other currencies. However, the currency pair EUR/USD covers 23 percent of all transactions and became the most traded currency pair since the introduction of the Euro. (BIS,2016) The U.S dollar remains to be the main reserve currency, traded currency and international debt currency for many countries. Since the introduction of united European currency, the Euro took second place on the global market. These two currencies represent two influencing regions which have an impact not only on the EUR/USD, but on the whole world.

The Forex market is attracting many people, because of it's liquidity and high returns, there is the possibility to earn a lot of money and fast. For the same reason, investment in currencies is one filled with risks for the investor. Traders have developed a numerous number of strategies and tools to predict future developments of currency prices. However, it remains an unanswered question and there is no sure way to predict it with 100 percent certainty. Nevertheless, a combination of technical and fundamental analysis eliminates some level of risk and provides clarification on specific events for the trader.

The following section will consider the aim of this thesis and specific methodological approaches used for analysis. In addition, defined hypothesises are confirmed by a combined approach of technical and fundamental tools. Section 3 considers main definitions used by traders and gives a theoretical overview on forex history. It also provides information about major participants of the market and specific positions of

individual investors among others. Section 3 is providing an overview on historical events in order to understand the connection between economic decisions and current positions of the forex market. Positions of the U.S dollar and the implementation of the Euro globally had a profound impact on the development of foreign exchange strategies. Investment decisions are based on the economic output of two revival currencies. Both mentioned currencies have specific qualities, because of different government intervention strategies. Currency trading has a high uncertainty for future profits. Even technical analysis, which is liked by investors for its specific results and easy implementation, has its limitations. For example, the technical indicator ADX will provide the same result for every trader. However, each trader might interpret the results differently. These specifics and other limitations are stated in the 3rd section as well.

The practical part of this diploma thesis is divided according to types of analysis. The first type of analysis is applied to identify the currency movement of the EUR/USD and is based in technical analysis, specifically chart analysis. Thanks to chart analysis, construction of support and resistance lines as well as the price tunnel of the EUR/USD was identified. Additional technical tools such as trend lines, ADX, and Fibonacci enable the individual to create a complex picture of currency rate position. Fundamental analysis confirms results from some of the technical indicators with specific economic data from both economic areas. It also brings an overview of political situations in USA and Eurozone, as it is a crucial part of traders decision-making process. Based on these analyses, concrete investment advice is given to traders in the last part of the diploma thesis.

2. Objectives and Methodology

2.1 Objectives

The main objective of this diploma thesis is to evaluate behavior of the Euro in the past and the current position of Euro on the stock market with regards to the US dollar. In addition, the aim of this diploma thesis is to provide theoretical and practical skills of effective forecasting of financial markets.

For achieving these defined goals, the following tasks are accomplished:

- Definition of financial transaction. As an example, Forex currency market, definition of basic concepts, introduction to the technical and fundamental analysis.
- Definition of correlation between currency rates and other fundamental factors.
- Suggestions for investors made based on obtained results. In this work the implementation of both, technical and fundamental analysis on currency pair EUR/USD is represented. The received results from fundamental analysis are compared with technical results and others investors' expectations.

Based on the analyses of the EUR/USD exchange pair during the ten-year period lasting until the 28th of February 2017, this paper will focus on evaluating some key determinants affecting this exchange rate and providing forecasts of its future development. The combination of both fundamental and technical analyses will be implemented and the results evaluated.

Hypotheses:

H1: Traders strategy for price prediction of currency pair EUR/USD can involve both fundamental and technical analysis.

H2: Price behaviour of currency pair EUR/USD is characterized by long-term stability.

H3: There is a significant relationship between macroeconomic indicators and exchange rate movement of currency EUR/USD.

H4: Technical analysis of the Forex market is suitable for short-term investment decisions.

2.2 Methodology

The theoretical part of this diploma thesis is based on studies of relevant literature and contains an overview of the international currency market Forex. It describes the history of its origin and the main developmental trends, as well as the essence of fundamental and technical analysis and its practical importance. The literature review also contains the definition of the major problems of forecasting. The empirical part contains fundamental analysis and technical analysis constructed from the latest available data set. The results are then compared and evaluated.

The theoretical part of this diploma thesis is based on study of relevant literature, and description of main definitions. The theoretical part describes development of Forex in the 20th century and contains an overview of the international currency market Forex today. The empirical part contains fundamental analysis and technical analysis constructed from a ten-years data set. Prognosis and suggestions to investors are prepared for the next period until June 2017.

Technical analysis is based on chart analysis, such as the price tunnel figure, support and resistance lines. In addition, trend analysis is represented by a simple trend line and by the following indicators: Fibonacci retracement levels, time zones, and ADX. Fibonacci retracement levels are used to identify the probability that the price of EUR/USD will follow the currency trend. Fibonacci time zones allow someone to specify a point in a time, when the price might change trend or make significant movement. This indicator is an alarm for entering the market or closing a deal. The indicator ADX is illustrating the power of trend and significance of signals. Fundamental analysis consists of the evaluation of economic performance of United States and Eurozone and discussion of the latest expected world news.

In order to determine the main economic factors influencing the EUR/USD exchange rate and evaluate the power of their significance, the following methods are implemented: qualitative, fundamental, technical, quantitative, time series, trend analysis, chart analysis and prognosis analysis. The Main tools that provide aid to this thesis include Microsoft Office and trading platform Rumus 1.8.4.

3. Literature Review

3.1 Forex

“Forex (or FX) refers to the foreign exchange markets, where currencies are traded. It is the biggest and fastest growing financial market in the world, with an average daily turnover of almost \$2 trillion – many times the total traded volume of the US stock exchange.” (Cheng, 2007) Since 2007 the transaction daily turnover doubled and it is continuing to growth.

The currencies are notably liquid. Thus, Forex can be called the most liquid market of all. It is also a significantly profitable market, but the risks are high at the same time. The percentage of traders who loose is not known for sure, but it is assumed to be in a range from 50 to 90 percent. Forex used to be a place for trading only accessible for big transactions, but not anymore. At this moment, almost any individual can open and close deals on currency fluctuations.

The price of currencies, theoretically should not be influenced by any players on the market as they are too small for it. This is a description of forex markets and perfect market competition as well. Another characteristic which is making forex the most efficient market is very low entry/exit barriers, information is available for everybody and there lacks an economy of scale. (Cheng, 2007) In addition, traders can gain from both bull and bear trends. Somebody always can gain profit from speculations. Trending on FX is accessible 24 hours a day, on that account traders can plan their own trading day strategy and have second full-time job simultaneously. There are no trading rules or limits on the forex market regarding the amount of traded currency. This means that this market is not regulated by specific centralized authorities.

3.1.1 Main definitions

Besides the Forex exchange definition, there are some expressions traders are using on a daily basis. Before starting with the implementation of analysis, it is important to state the following definitions (Silvani, 2008):

- Ask Price – Is the lowest price at which market participants are willing to sell a given currency. An ask price trader can buy the base currency. For example, the quote EUR/USD 1.0446 means that trader can buy one Euro for 1.0446 U. S dollar.
- Base Currency – The first symbol in the currency pair. It shows the value of the base currency in units of the second currency. For example, the quotation USD/CHF equal to 1.6215, means that one USD costs 1.6215 CHF. In that example, USD is the base currency and CHF is the quote currency.
- Bear market – Market characterized by decreasing prices.
- Bid Price – This is the price at which market participants are willing to buy a certain currency. The Bid price trader can sell the base currency at the highest point. For example, in the quote EUR/USD 1.0446 traders can sell one Euro for 1.0446 U. S dollar.
- Bull market – When the market is characterized by rising prices or by investors expectation and believe that prices will increase.
- Double Bottom – Is a situation when the price falls twice to a certain level and then raises again.
- Double Top – The figure of technical analysis representing a situation when the price hits a certain level twice and then falls again.
- Gap Forex – The price range which was not quoted.
- Offsetting transaction – Form of counter trading strategy, which is used to eliminate or reduce some of the market risks.
- Open position – A market position at a certain moment, before reverse transaction has been maintained.
- Pip Forex – The smallest unit of currency prices. Usually to the second or fourth decimal place.
- Spread – The difference between the purchase price (Bid) and sell (Ask) price.
- Take Profit Order – Is intended to fixate profit in the case when a given order reaches a certain level.

3.1.2 Participants

Kel Butcher defined in his book “*Forex made simple*” (2011) five main participants of the forex market stated below.

Inter-bank market. The major group of participants of the international currency market are commercial banks. They are taking part in the biggest volume in overall exchange transactions from their own account or on behalf of clients. Other participants of the currency market are held in commercial banks, their bills and sending sell or buy requests. Banks, as a specialized organization, accumulating (through the transactions with clients) market needs and if they are not able to meet these needs, they realize transactions through other banks. For that reason, Forex is not a stock exchange, but a market of interbank transactions. Commercial banks realize some speculative trading on its own account as well.

Companies and businesses. Companies, which are engaged in import operations, creating demand for the foreign currency and at the same time they are supplying national currency. The situation is opposite if the company realizing exporting transactions. In that case, they are creating supply of foreign currencies, from money they received by selling goods, but firms need domestic currency for covering wages, operation and tax expenses. In addition, both types of companies place their free funds on their deposits in order to attract more investors. As a rule, all these transactions are done through commercial banks.

Hedge funds. Hedge funds are a specific form of investment partnership. It is union of the fund manager, who is often known as a major partner and investor. Investors of hedge funds are sometimes called limited partners. The limited partner first invests into the hedge fund, next the general partners are realizing transactions according to the fund strategy. The purpose of the hedge fund investors is to maximize revenue and eliminate risk. To trade on the Forex market, each individual participant takes high risks, but the hedge fund uses many tools for preventing high losses. In addition, they are creating large force on the market, which individual investors are not able to realize.

Traders. Presence of new markets is leading to the creation of a new profession known as a “trader”. “*Retail and small traders provide liquidity and price discovery (the determination of price through the interaction of buyers and sellers) to the market, making it easier for hedgers and other market participants to offset their risk.*” (Butcher, 2011)

The aim of traders is to gain profit by using individual funds or officially represent their client (investor).

Brokers. Forex brokers are specialized companies whose main activity is providing intermediary services on the international currency market. “*Broker is an agent who executes orders to buy and sell currencies and related instruments either for the commission or on a spread*” (Silvani, 2008) In particular, they are intermediaries between retail clients and financial institutions. The broker is the key figure on the Forex market, since they provide access to private traders into the forex exchange market. Forex brokerage companies act as a bridge between banks and traders.

Brokerage companies are performing important functions in the Forex exchange. First of all, thanks to them clients have access to the trading platforms, which allows them to carry on transactions and remains to be the basic tool of any trader. Besides making transactions, trading platform gives access to the newest currency rates and clear overview of their trends. Secondly, Forex brokerage companies provide leverage to the customers, whereby traders can operate in the market with amounts that greatly exceed their deposit. For example, if traders only have 100 U.S Dollars on the account and leverage of 1:100, they can make transactions in value of 10 000 U.S Dollars. It is important to remember the fact that with increasing leverage not only can there be enormous potential profits, but also major potential losses. It should also be noted that nowadays almost all major forex brokers provide their clients access to expert’s analytics, which notably simplifies the prediction of currency behaviour.

One of the main sources of income is a brokerage fee imposed on every transaction made by the trader. It can be applied in two different ways: as a small extra charge to the spread or as a direct payment for each realized operation. Furthermore, every honest broker is gaining, if traders have profit from transaction, because then they will stay longer as a client. The work of brokerage companies is strictly regulated by non-profit organisations and government institutions, because they are the holders of information. Dishonest brokers might send quotations late to the client, after closing its own deal.

Central banks. Some of the writers consider central banks as another market participant. Central banks have a power to regulate supply and demand of national currency. They are implementing various monetary policy restrictions, and control the

amount of money in the country as well as regulating interest rates. For example, low money supply may cause high demand and increase in value of a national currency. One of the crucial indicators for central banks is inflation, which has a direct impact on exchange rates. (O'Keefe, 2013)

3.1.3 **Historical events**

The way the forex markets persuade is now retail in shape of this market. In the past, the Forex used to be a place exclusively for banks, private investment institutions or corporations. Nowadays, the forex market is a decentralized market freely accessible for everyone. The Forex market is running non-stop and globally, from Sydney to Los Angeles. The possibility to trade online increased volume of currency trading rapidly. (Cheng, 2007)

Gold Standard System

The gold Standard System is known as monetary policy, when the amount of money is defined by a specific amount of gold. This system was chosen because gold is expensive, has a long-life and hard to falsify. The negative side of using gold is that the price of gold is very dependent on supply.

“The underlying idea behind the gold standard was that governments guaranteed the conversion of currency into a specific amount of gold, and vice versa. In other words, a currency would be backed by gold.” (Marcovici, 2013) In 1875 the majority of the countries agreed to specified price of currency to one ounce of gold. Subsequently, the difference between prices of two currencies compared to an ounce of gold was the first exchange rate.

During World War I the majority of economies stopped using the gold standard system because there was deficit of gold. Despite that fact, many countries are still holding gold reserves.

Bretton Woods Agreement

After World War II, 44 nations agreed that the gold standard monetary system is not reliable anymore and economic instability was the main cause for war. To avoid repeating the same problem again, they came up with idea of Bretton Woods monetary system. The output from negotiations consisted of a few key points (Lien, 2009):

- Establishment of three economic authorities with the intended purpose to have fair-trade conditions and international economic stability.
- Creation of fixed exchange rates of currencies.
- Choosing the U.S dollar as the main currency for government reserves, instead of gold.

Since the economy of USA was the least damaged compared to other countries after the war, they became monopolist on the gold market. For that reason, one of the most significant points to come up out of the Bretton Woods Agreement was conversion of the U.S dollar to the main world's reserve currency and the only one backed by gold. The Bretton Woods agreement was also blamed by some economists for the same reason.

The International Monetary Fund (IMF) was established in 1944 in order to maintain an international monetary system to ensure the stability of exchange rates and international payments systems and allowing countries or individuals to make transactions. According to the agreement all member countries of the fund set up the nominal value of its currency to the U.S dollar. In the case of deficit in balance of payments, IMF is obliged to help member countries with U.S dollars or gold.

Countries under this agreement could devalue or reevaluate their currencies, but if it is more than 10% of the declared parity, they need official approval of the IMF. This approval should be given only if the balance of these countries is in "long-term disequilibrium". However, in practice nobody asked for permission, as devaluation makes sense only when it is unexpected. For example, devaluation of the British Pound in 1949.

The end of Bretton Woods Agreement

In the beginning of 1940s it was more profitable for a government to keep their reserves in U.S dollars than in gold, because investments in U.S dollars were bringing more income on interests. However, the system of fixed exchange rates contained a serious contradiction. On the one hand, investors should have the same trust in dollar as in gold, then it should also have a fixed rate. This was to ensure that everybody's choice would be indifferent between having reserves in dollars or in gold. In that case, the U.S dollar should be backed with U.S. gold reserves (otherwise there will be conflict of trust). On the other hand, the U.S. dollar should be produced in sufficient quantities enough to cover an

increase in the international money supply to serve the growing number of international transactions.

In the end, this contradiction broke the system of the gold standard. Already at the end of 1964 the U.S. dollar reserves of the central banks reached a value of U.S gold reserves and a theoretical threshold of illiquidity was reached. Between 1960 and 1970 the dollar reserves in other countries has tripled. In the same period, the U.S gold stock declined because of the requirements to exchange U.S Dollars to gold. There was distrust of the United States' ability to exchange dollars for gold at the fixed rate.

In 1965, France executed a massive exchange of their dollar reserves to gold, leaving the so called gold pool of 7 countries, which agreed to maintain the price of gold. Private banks in Europe began to attack the system by requiring the exchange of billions of dollars in the federal reserve system. In March 1968 the Central Banks of some European countries gave up trying to stabilize the gold market. (Lien, 2009)

In August, 1971 the FED has stopped converting dollars into gold and defined limited fluctuations par value currencies against dollar at the level of 2,25 %. This event was determined to be the official end of Bretton Woods agreement. The end of this system no longer allowed currencies to be fixed to gold, this brought in a new system where prices are defined by market behavior. (Bordo, 1993)

Despite the fact that the Bretton Woods agreement stopped its existence, some of the policies are still applicable today. For example, three agencies: IMF, World Bank and WTO (GATT before) are operating to this day.

U.S President Nixon did not believe, as did many other economists of that time, that the free market would be able to fairly manage currency prices and stabilize the economy. He stated that an unstructured foreign exchange market will cause crises of international trade and global recession. President Nixon introduced something called the Smithsonian Agreement a few months later and called it "The greatest monetary agreement in the history of the world". This agreement was aimed to maintain fixed exchange rates without supporting them by gold. The given agreement lead to significant increases of gold prices and subsequently to a constantly growing U.S deficit.

The introduction of a new system was accompanied by high inflation rates, as many currencies including the U.S dollar needed to adapt to it. All mentioned problems plus the

oil price crisis forced Forex to close in February, 1972. It was opened again in March 1975. This time the U.S. dollar was defined just by the market; it wasn't fixed to any commodity. A market with high liquidity and constantly changing prices attracted many speculators.

Plaza Accord

On September 22, 1985 the USA, together with Germany, Japan, Britain and France agreed to adopt a number of measures to regulate the foreign exchange markets. The agreement was signed in the hotel "Plaza". Negotiation processes were mainly between Germany, Japan France and then separately between Japan and USA. (Bergsten and Russel, 2016)

At that period, inflation rates around the world had been very low. In contrast to the stagflation period of the 1970s, this period saw high inflation and low economic growth. In 1985 the global economy was the opposite: a low level of inflation was accompanied by rapid economic growth. Despite favorable conditions, which led to a decrease in interest rates (which was especially beneficial to developing countries), world economies were under high risk of protectionism in some countries. The United States saw and experienced a constantly increasing budget deficit. Japan and Germany had surpluses increased in their budgets. This significant imbalance could cause serious economic instability, which adversely would affect the foreign exchange markets and thus the global economy as a complex. (Klein and Welfens, 1990)

Consequences of fiscal imbalance and its result, policy of protectionism, required immediate action. It was believed, that the cause of the problems were rapid growth (over 80%) of the US dollar against the currencies of major U.S trading partners, which caused a huge trade deficit. A lower dollar could help to stabilize the world economy, as in this case, the import and export possibilities of all countries would be balanced. (Lien, 2009)

The goal of the Plaza accord was to depreciate the U.S. dollar and increase rates of other currencies. Each country agreed to change their economic policies and intervene into currency markets to the extent that was necessary for the dollar devaluation. The United States of America had to cut its budget deficit and lower interest rates. Other participants agreed to raise interest rates. In addition, Germany had pledged to reduce taxes.

In the reality, the countries participants of the agreement were not in to hurry to fulfill all their promises. Specifically, the U.S did not cut their budget deficit. Due to sharp appreciation of the Japanese Yen, growth in the Japanese economy has been hit hard, because Japanese exporting companies have become less competitive in overseas markets. Some of the economists believed, that it led to the 10-year recession in the country. On the other hand, the U.S experienced significant economic growth and low inflation rate. However, within two years, the dollar depreciated by 46% against the German mark and by over 50% against the Japanese Yen. Perhaps the most important result from the Plaza agreement was that Central Banks had the main role in exchange rate regulations. Exchange rates were not fixed, but determined mainly by supply and demand. Even though Central Banks had the right to intervene if necessary.

Figure 1 U.S Dollar Weighted Index from 1980 till 2016



Source: <http://www.tradingeconomics.com>, December 2016

Economists are rather skeptical about the effectiveness of this agreement. The effect is separated into two parts: shift of exchange rates and shift of the trade balance. Regarding exchange rates, it is believed that official government authorities are having impact only in short-term periods without big impacts on fundamentals. As it is depicted on the chart above, the dollar reached historical peaks and fast interventions were necessary. It is not confirmed that the Plaza tools alone made the change illustrated on chart, but the dollar had depreciated rapidly since 1985. However, even shot-term interventions might support the

market and be useful. Compared to the U.S dollar depreciation, trade balance, as a result of intervention, did not decrease, but steadily got worse from 1986 till 1987.

Asian Financial Crisis

Asian financial crisis has affected most of the East Asia in July 1997 and raised fears about a worldwide economic crisis. The underlying causes of the crises that unfolded in 1997 were primarily deeply associated with accumulated costs of accelerated industrialization. Despite all the differences in nature of crises, Mexico in 1994 and in Asia in 1997-1998, the main impact of the crisis was on the national banks and currency systems with subsequent correction of foreign exchange markets. The scheme of the financial crisis was approximately the same: a massive outflow of external capital created a threat of a fall in the exchange rate of the national currency, after which foreign institutional investors operating in the domestic market were striving to withdraw capital and fix any profits. As a result, the crisis spread to various sectors of the financial market.

The crisis began in Thailand from the collapse of the Thai baht. Among experts of macroeconomics, explanations for the mechanism of the Asian crisis were primarily highlighted by researchers as the growing inflow of the capital in conditions of floating exchange rates in 1995 and 1997. This led to a reassessment of real exchange rates, which in the end increased the current account deficits of the balance of payments. Due to the lack of foreign currency reserves, governments were forced to implement a “float exchange rate”. During this period Thailand accumulated external debt, which has made the country bankrupt long before the crucial fall of its own currency. With the expansion of the crisis, most countries in Southeast Asia and Japan experienced a strong drop in national currencies, devaluation of stock markets, significant increases in debt and visible shortcomings in the value of assets. The most affected countries by the crisis were Indonesia, South Korea, Thailand, Hong Kong, Laos, Malaysia and the Philippines.

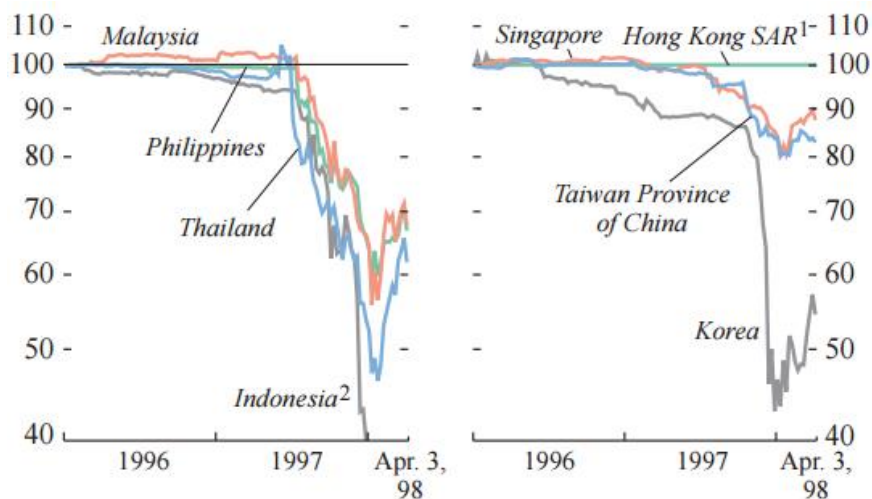
In panic creditors started to withdraw loans from Asian countries, which led to bankruptcy. In addition, foreign investors were trying to take their money, which caused a drop on foreign exchange markets and created additional pressure. To prevent currency collapse, governments raised interested rates to extremely high levels with the hope to stop the outflow of capital and start to intervene in the foreign exchange markets by buying

national currency. However, none of these policies cannot be maintained for a long duration.

According to Michael C. Deppler, Director of the IMF's European I Department, this crisis had a positive influence on European economies. *“Direct effects on industrial countries in fact include some favorable ones, such as terms of trade gains from lower prices for oil and raw materials, lower yields in capital markets, and downward pressure on prices owing to enhanced competition from Asia. Moreover, slowing exports to Asia have helped to prevent overheating in countries at an advanced position in the business cycle (Denmark, Finland, the Netherlands, Norway, and the United Kingdom).”* The impact on industrial countries was expected to be moderate, as well.

After the mass sale of currencies and unsuccessful interventions, Asian economies had been destroyed and were unable to operate normally. Thai Bhat, with the highest rate, had depreciated by 48 %, and by the end of 1997 it reached 100 %. However, the most affected currency by crisis was the Indonesian Rupiah. The rate of which was relatively stable before the collapse. The Indonesian national currency depreciated by 228 %. In 1997-1998, the Japanese Yen decreased only by approximately 23 % compared to U.S. dollar.

Figure 2 Bilateral U.S Dollar Exchange Rates



Source: Finance & Development Magazine, IMF, 1998

The Asian financial crisis from 1997 till 1998 demonstrated interdependence of economies and their impact on world currency markets. In addition, it showed the inability

of central banks trying to effectively regulate the exchange rates. in situation when exchange rates are not supported by real economic indicators. With the support of IMF and implementation of more rigorous requirements, four Asian “dragons” again began to revive. Southern Asia is back to its former status as one of the most developed regions of the world.

Introduction of the EUR

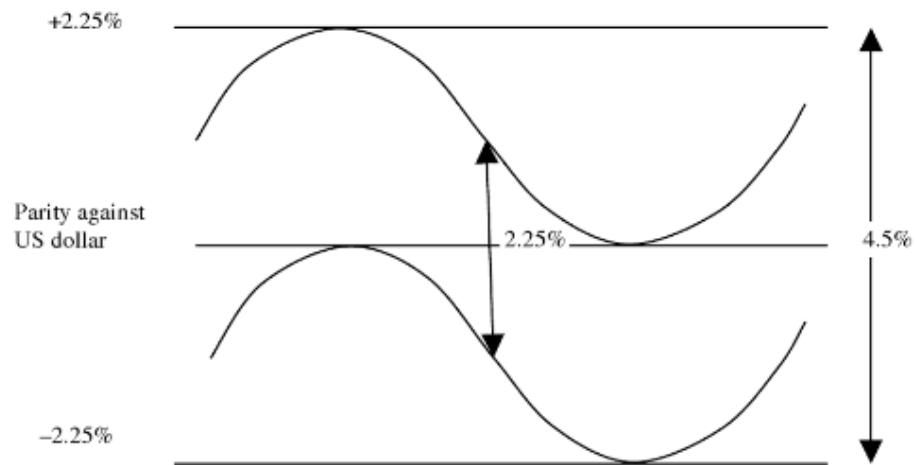
The idea of common European currency was introduced a long time before the Euro was created. The first step towards the creation of the Euro was the Rome Treaty signed in 1957 by Belgium, Luxemburg, Italy, The Netherlands, France and Germany and following establishing of European Economic Community. This treaty came into force on January 1, 1958 and made the idea of European integration closer to realization. (Scheller, 2004)

In 1962, for the first time, the European Community mentioned the need for a single European Monetary Policy and wanted to have fixed exchange rates between all member states. Nevertheless, Bretton Wood agreement brought exchange rate stability for many years and it was decided that there is no need for another institutional change. For that reason, the Committee of Governors was more focused on tightening relationships between member state’s central banks in order to move forward with European integration to the next level.

The situation on the global arena had changed rapidly by the end of 60s. With the collapse of Bretton Woods system many countries, especially USA, experienced economic crisis, which forced them to change economic priorities. In 1970, the Prime Minister of Luxemburg introduced the Werner report and proposed to move towards economic and monetary union in three stages. It puts forward the idea of “currency snake”, when exchange rates are fixed in the range of 2.25 % according to Smithsonian agreement. (Hamori, 2010)

In 1972, the idea of the “currency snake” was created and implemented by the European Monetary system. EU central banks signed an agreement to limit exchange rate fluctuations. At the same time, there was an introduction of a prototype for the now known Euro called the European Currency Unit. Implementation of this plan was stopped by the energy crisis in 1972, caused by the sharp rise of oil prices.

Figure 3 Currency Snake



Source: Hamori. *Introduction of the Euro and the monetary policy of the European Central Bank*, 2010.

Another significant step towards EMU was the creation of the European Monetary System in 1979. EMS “managed to keep most Community currencies in a single exchange rate system” and “EMS also covered the adjustment of monetary and economic policies as tools for achieving exchange rate stability.” (Scheller, 2004)

The idea of a European Common Unit (ECU) was developed in the Single European Act (1986) and Maastricht Treaty (1992). The main goal of Single European Act was to introduce tools of a single market and further necessary steps to complete it. Maastricht Treaty listed competencies of the European Central Bank and gave power to it and national banks to issue Euro banknotes and coins. National Banks are also involved, as they are the ones who put cash into the circulation and withdraw it. One of the most significant outcomes of Maastricht Treaty, related to economic or financial policies and its ultimate goal, to introduce a single currency for the majority of Europe. The agreement provided specific schedules for introducing a single currency and common rules in the field of the state budget, inflation and interest rates for all members of future monetary union.

The president of European Commission Jacques Delors, similarly to Pierre Werner, offer to concentrate on specifically on three stages leading European Committee to EMU. He presented “Delors Report” in 1989 with explanation of following three stages with specific timeline (Scheller, 2004):

- Stage one started in 1990 and was focusing on reducing the barrier for free movement of capital, establishing closer economic cooperation among Member States, implement free use of European Currency Unit and increasing cooperation among member state's central banks. In contrast to stage two and stage three, stage one was maintained through already existing institutions and treaties.
- Stage two started in 1994 and was aimed to prepare everything for the final stage. It's aim was to establish necessary institutes such as European Monetary Institute (EMI). This institution played an important role in tightening cooperation between central banks and establishing European Systems of central banks (ESCB). The process of autonomy of central banks started in the second stage as well.
- Stage three started in 1999. Several important events happened in the third stage. First of all, the Euro was introduced, then entry of EMUII and entry of Stability and Growth Pact. The Stability and Growth Pact are ensuring compliance of budgetary regulations among EMU states.
- In 1999, the ECB took over the responsibly for monetary policies and the fixing of exchange rates.

The existence of single currency demanding single policies and regulations for the Eurozone. For ensuring exchange rate stability and smooth decision-making processes, all regulation should be implemented by disinterested but centralized bodies within legal standards. Listed above, requirements for maintaining the Euro are the exclusive responsibility of European Central Bank, European System of Central Banks and the Euro system.

Convergence criteria. The main objective of European Central Bank is similar to other Central banks, to ensure price stability of Euro. In order to fulfill this goal, member states defined convergence criteria, also known as Maastricht criteria. European Union member's states are required to fulfill these criteria, so they could enter the third stage of the European and monetary union and adapt common European currency.

According to the ECB, criteria are divided in following parts:

- Price development. In Article 140 (1) it is stated *“the achievement of a high degree of price stability; this will be apparent from a rate of inflation which is close to that of, at most, the three best performing Member States in terms of price stability”*. In other words, inflation of state should not exceed the range of ± 1.5 percentage of three best performing Member States.
- Fiscal development. Referring to the Article 140 (1) sustainable budgetary position *“shall mean that at the time of the examination the Member State is not the subject of a Council decision under Article 126(6) of the said Treaty that an excessive deficit exists”*. Excessive deficit in this case means values over 3 percent of GDP. Another fiscal criterion is debt-to-GDP ratio, which should not be more than 60 percent of GDP.
- Exchange rate development. Home currency should not be devaluing against Euro for at least two years and have a normal fluctuation.
- Long-term interest rate development. Last convergence criterion is referring to the Article 140 (1), where it is stated that *“...observed over a period of one year before the examination, a Member State has had an average nominal long-term interest rate that does not exceed by more than two percentage points that of, at most, the three best performing Member States in terms of price stability...”*.

The European Central Bank creates a Convergence Report at least every two years, where the economic situation of non-Eurozone countries is examined. From all EU member states, only nine still have not adapted the Euro. However, the countries such as the UK and Denmark had an opted-out. This means that they are not forced to adapt the Euro in the end. For that reason, they are not examined in the convergence report. Despite the fact that the United Kingdom and Denmark have a special status, they also have a possibility to join the Eurozone if they fulfill the necessary requirements.

According to the Article 122, Member States have an opportunity to negotiate “derogation”. It means that these countries don’t need to be a part of single currency area and remain monetarily independent. A derogation status is transitional and mostly applied to countries who joined the EU in 2004. The convergence report is reviewing economic situations of these countries once in a two year period. For example, the Czech Republic is obliged to accept the Euro as soon as it will fulfill all convergence requirements. In

addition, another conflict with convergence criteria is that not all countries, which have implemented the Euro today have met these criteria in the past, but it does not prevent them from entering Eurozone.

As was already mentioned above, the Czech Republic is also demanded to adapt the Euro. According to the report, the 12-month average rate of inflation was lower than reference value (0.7 percentage) on 0.3 percentages. However, inflation has been fluctuating in a relatively wide range, from 0.3 to 6.6 percentages. Government debt is going along with requirement of Maastricht Treaty from 2015. There is an average risk of any fiscal crisis for the future. Regarding the exchange rate, it is stable and fulfilling requirements of ECB, but Czech Republic does not participate in the ERM II. Long-term interest rates are below the required value, but complied convergence criteria. Overall, from an economic point of view, the Czech Republic is capable to adopt the Euro now. Nevertheless, there are some barriers to it. *“Czech law does not comply with all the requirements for central bank independence, the monetary financing prohibition and legal integration into the Euro system. The Czech Republic is an EU Member State with a derogation and must therefore comply with all adaptation requirements under Article 131 of the Treaty”* (Convergence report, June 2016)

3.1.4 **Implementation of Euro**

The introduction of the Euro was gradual: first in non-cash transactions and then banknotes were issued. January 1, 1999 countries of European and Monetary Union (EMU) introduced a common currency, the Euro (EUR) and start using it for non-cash payments. Since then, national currencies exchange rates were strictly fixed to the Euro, which made the Euro a fully independent monetary unit. At that moment, countries could use both national and European currencies equally. The trade began from January 4, 1999. In 2001 Greece also joined the Eurozone and became the 12th member state.

From January 1, 2002 Euro banknotes and coins were brought into circulation, gradually replacing old banknotes and coins of national currencies, although it was planned in the early 1990's. The first step for replacement was that national central banks defined the amount of cash demanded, these data sets were updated every year. The requirements for countries outside the EU had to be met as well, but it was complicated to estimate the

amount. For example, the Deutsche Mark was used in Montenegro from 1996. In the end, it was decided in 2001 that 14.9 billion banknotes (equal to €633 billion) will be exchanged to the Euro. By 2003, there was already 8.2 billion Euro in use. (ECB, 2007)

The period of replacement for each country identified on their own (but not more than six months). Within six months, national banknotes and coins could still be used, but after June 1, 2002 the Euro become the only legal way of payment in the Eurozone.

In 2006, Slovenia meet the convergence criteria and entered the Eurozone in 2007. Cyprus and Malta have passed the procedure as well and joined in 2008. The next expected country became Slovakia in 2009. In addition, the Euro is used in small states, which are officially not a part of European Union, such as the Vatican, San Marino, Andorra and Monaco. Some Balkan countries, which are using the Euro are Montenegro and the disputed territory of Kosovo.

Euro symbol and name. The name Euro was given by European Council in Madrid in 1995. This name is the same in all official languages and is easy to pronounce while having also a representative character. Euro (€, banking code: EUR) name has correlation with the first letter E and stands for Europe. The parallel lines symbolize the stability of Euro. The symbol was approved by President of the Commission. The official abbreviation for the Euro, EUR is registered in the International Standards Organization and used for business, financial and commercial purposes.

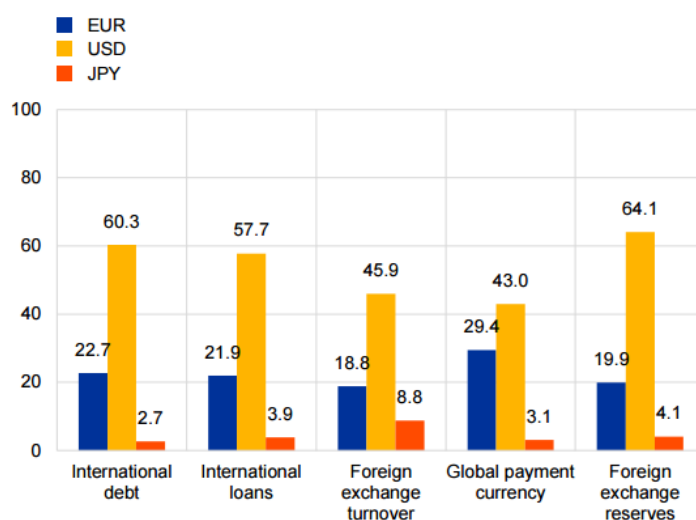
ECB. European Central Bank is playing the main role in facilitating the Euro area and cooperation with national central banks. It is located in Frankfurt and Main, Germany and has over 2,500 employees from all over Europe.

The ECB mission is to ensure price stability of Euro by “*reaching highest level of integrity, competence, efficiency and accountability.*” (www.ecb.com) Through the Single Supervisory Mechanism, ECB aimed to be as transparent as possible and openly communicate with EU citizens. Main decisions are taken by Governing Council, which is part of ECB and consist from six members of Executive Board plus heads of national banks from 19 countries. Governing Council defines Eurozone monetary legislation during meetings every two weeks.

Why Euro? Euro is freely convertible currency and it is on the second place after the U. S. dollar in terms of payments made for goods and services. Many large financial

group completely abandoned the use of the dollar in their financial calculations and adopted the Euro. After the introduction of the European single currency, it rightly was called on of the most popular reserve currency and is now widely used by the national banks. U.S Dollar is still remains to be the most important currency in the international monetary system, but share of Euro is relatively high. As an example, the graph below shows, that 29,4 percent of all payments are made in Euro, which is only 13.6 percent less than in U.S dollar.

Figure 4 Share of Euro in international monetary system, %.



Source: BIS, IMF, SWIFT, CLS and ECB calculations, 2015

Euro has relatively short history of existence compare to U.S dollar, but it is already taken important position on the global scene. In a future, it has potential to take a place of U.S dollar in reserves. So far dollar can offer better monetary and fiscal policies and US economy has greater growth. In addition, this position of U.S Dollar can become stronger sue to the intention of new president to increase interest rates.

3.1.5 U.S Dollar

Evolution process and growth of the world economy demanded the establishment of a structured settlement system, which will be a global standard for all national currencies and all nations. The idea of integrated monetary system was discovered in Europe during 19th century and later gradually become worldwide. Since then, four main currencies systems were succeeding each other.

The dominant world currency is usually the currency of the country, which is holding leading positions in the international trade. For the long time, it was Pound sterling, reflecting the power of British economy during the 19th century. After World War I, the leading position was taken by the dollar, indicating power of U.S economy in the late twentieth century. Afterwards, dollar was pressured by introduction of Euro, which led to the creation of the world monetary bi-system with dominance of two currencies on the global trading arena.

The U.S dollar is one of the most powerful currency in the world market. As it is pictured on the graph (Figure 4), 64,1 % of government reserves are hold in this currency. It is overcoming other currencies in other categories such as international debt, international loans, foreign exchange turnover and global payment currency. According to the BIS calculations, U.S dollar holding almost half of the market in all states categories.

The first modern dollar sign was applied by wealthy, Irish seller and planter, Oliver Pollock. He was supplier for the American army during the war against the British oppressors. He was recording revenues in the account book with the mark combining P and S. Pollock once presented his bill to the American Congressman Robert Morrison, who become the first in using a dollar sign in the documents. The reason for the mark was the Spanish peso – P with S is peso in plural. Two vertical sticks symbolizing, two pillars on peso. In British colonies, it was known as “dollar with pillars”. (Weatherford, 1997)

Since 1972, one dollar was equal to 1.6033 grams of pure gold or 24.057 grams of pure silver. After 80 years, in 1873, gold dollar was declared as an official currency with the gold standard equaling to 1.50463 defined by the law in 1900. The Golden Standard was existing following 30 years till the crisis in 1929-1933. In 1933, the government of the United States was not able to maintain fixed exchange rates any longer, hence golden equivalent of the dollar was reduced to 0.88867 grams, around 41 percent of its previous value.

After World War II, the United States became a superpower with crucial roles in the global economy. In compliance with Marshall Plan, a big amount of dollars entered the now destroyed Europe and became a pivotal reserve currency of the Western world. Dollar popularity among central banks was significantly increasing, because they could exchange U.S dollars for gold at the fixed price. However, in the middle of the 60's, the dollar's

reputation rapidly deteriorated. Increasing inflation and U.S deficit of trade balance led to another devaluation of the dollar. (Lovett, 2015)

During economic downturn between 1980 and 1982 foreign investors were attracted to the American economy by having inflated interest rates in commercial banks. In the following decades, the volume of the dollar has increased significantly due to the inflow of foreign capital. In 1983 the inflow of capital exceeded the outflow from the United States. As a result, in 1983 the U.S turned from the net exporter into net importer. In the following two years, the United States became a pure international debtor with dependence from steady inflow on foreign capital. U.S monetary policy was aimed to support a high interest rate, therefore the dollar reached the maximum values against other major currencies.

The period of the Reagan presidency is characterized by a fundamental renewal of the U.S economy. Specifically, by transition of the U.S economy into an economy with high dependency on the outer environment. Modernization of the main industries was accompanied by a corporate reorganization, rationalization of production and management. In addition, the new level of productivity and labor efficiency was reached together with significant economic growth.

High interest rates are attracting capital into the US economy, but on the other hand the dollar became overvalued and this displeased U.S partners such as UK, Germany, USA, France and Japan. In 1985, these countries adopted the Plaza agreement. The agreement acknowledged that the dollar does not reflect a real and fundamental change in economy. As a result, central banks started purchasing Deutschmark and Japanese Yen in a big amount, which reduced the dollar's power in the global economy. In February 1987, it was agreed that dollar exchange rates against some of major currencies are consistent with the state of the economy. After the Louvre agreement, Japan has carried out large dollar purchases in order to appreciate its exchange rate and increase Japanese exports to the United States.

High trade deficit and federal budget deficits in 1987 led to a decrease in investor's interest in corporate securities, treasury bonds and U.S currency. In October 1987, four years of increase in the U.S economy were followed by 30 percent fall of share prices on the New York Stock Exchange. During this period, central banks and seven main U.S

partners were afraid of a global crisis. Therefore, they executed major foreign exchange interventions with the aim to stabilize exchange rates and lower interest rates.

The period between the end of 1991 till the beginning of 1993 is associated with the most serious and widespread currency market crisis after the collapse of the Bretton-Wood's monetary system. The mechanism that caused crisis was created in 1972 by European countries, and by Germany in particular. This mechanism called "currency snake". Originally, it was a mutual maintaining of currency fluctuations (each currency pair) in a certain range. At the same time, fluctuations of currencies of EU countries could not exceed the goal value against the U.S dollar.

In the mid 90's, financial globalization had reached high levels and international capital flows had increased significantly. The U.S economy was the most prepared for the conditions created by the crisis, thus U.S had become a major recipient of the international sources. Compared to the period from 1985 till 1995, when dollar had downward trend, in 1996 began with strong rise of dollar's rates against major currencies under the influence of a stable pace of U.S. economic growth, the growing inflow of foreign capital and structure changes. Increase of the dollar against major currencies was determined by several factors. Firstly, differences in the countries cycle phases: the U.S. economy was on rise after crisis in 90's, while the economies of many Western European countries and Japan experienced serious difficulties. Secondly, since 1995 there were large-scale capital inflows into the United States, especially on securities markets. Since the middle of 90's, the exchange rate of the dollar has had a significant impact of foreign demand for U.S assets and other investments.

The United States became a financial intermediary that provided redistribution of global resources. A key factor of massive inflows and appreciation of dollars was the difference between interests rates in Germany, U.S and Japan. Interests rates remained low and even declining throughout Europe and Japan, while in U.S it was helping on the same level or raised. In 1999-2001, the U.S stock market experienced a boom in growth of stock prices, especially of high-tech companies. The stock prices began to have a noticeable impact of the currency overvaluation. Overall from 1996 till 2002, the dollar had stabile growth. The following decrease of the dollar was caused by monetary policies of American president George Bush.

Besides the United States, the dollar is used in number of countries in Central and Latin America. The impact of the dollar on Latin America has always been significantly high. Member states of Central American Monetary Union failed to unify the national currency systems. Common currency, the Central American peso, was used only for mutual trade transactions. The process of dollarization scored the highest tempo during the 1990's in Latin America. The main reason for that was a sharp deterioration of the economic situation in the number of countries and the strengthening of the US foreign policy strategy in respective way. In 2000, Ecuador renounced its own national currency and changed it to U.S dollar. The Central Bank of Argentina prepared a plan for the replacement of the Argentinian peso to the dollar as well. For some period, the dollar was a component of monetary system in Panama and Haiti. The Central Bank of Argentina proposed to create a Latin American Monetary Union, aimed to replace national currencies to the dollar and transfer rights for fiscal policy regulations to the United States. In contrast to Eurozone, with common currency inside the union, the Latin American system based on foreign currency, which is first used for the external accounts and then replacing the national currency from domestic circulation.

To summarize, changes in the U.S. dollar through the decades was influenced by external and internal factors. Inside a country, there are such factors as dynamics of export and import, services and capital market, balance of payment, economic growth and national monetary policy. In addition, the exchange rate of the dollar is fluctuating under conditions of changing economies, primarily the economies Western Europe and Japan.

Federal Reserve System. The Federal Reserve System (FRS) in the United States is the equivalent of European Central Bank for in EU by status. It has following tasks (Overview of Federal Reserve System, 2015):

- Promoting minimum unemployment and stability of prices, keeping interest rates on acceptable level.
- Promoting financial stability and striving for minimalizing risks for the U.S economy.
- Promoting wealth and stability of financial institutions, regulating their activities and record their impact of the whole financial system.

- Promoting protection of consumers by examination, monitoring and analysis of new consumer complaints and trends.

The Federal Reserve System had remarkable differences, as it is rejecting the existence of single central bank on purpose. It consists from three main institutions such as the Board of Governors, Federal Reserve Banks and Federal Open Market Committee. Board of Governors is an independent agency and it is the only agency that reports to Congress directly, its members are picked by the President.

The Federal Reserve System is decentralized geographically on 12 parts with regards to economic and trade situation in this part. Each part had its own and completely independent Federal Reserve Bank. However, in 1935, through the development of infrastructure, technologies and financial sector, Reserve Banks have lost some independency by creating the Federal Open Market Committee (FOMC). In 1980, the Monetary Control Act included regulations, which led to tightening of cooperation between Reserve Banks and centralizing of some financial functions. In the end, they became more productive by distribution of responsibilities within 12 Reserve Banks. Each Reserve Bank is selecting nine members in board of directors every six years. These members are selected by the Board of Governors. In addition, each branch of each Reserve Bank has own board of directors. Directors are representatives of Reserve Banks for private sector. They are gathering insights about current economic situation as well. (Metlzer, 2009)

The revenues of the Federal Reserve System are not including government of congressional support. The main source of funds comes from the securities' interest earnings, market operations. Remaining surplus, after covering all costs, should be less than 10 billion U.S dollars. This surplus is transferred to the U.S Treasury.

Monetary Policy report. Since June 2016, payroll employment has an inclining trend and increasing constantly by 225,000 per month in average. The unemployment rate decreased by 0.4 percent and reached the level of 4.9 percent, which is considered as a moderate in a long-term perspective. The current labor market is characterized by a significant number of part-time employees. (Monetary Report, 2016)

Decrease of oil prices in 2014 and prices of non-oil goods had a downward pressure on inflation rate. However, from July till December 2016 inflation rates had an increasing

trend. For the same reason, prices pushed domestic investments in the energy sector downwards. It has increased from 0.8 in July to the point of 1.7 in December. In the meantime, gross domestic product is represented by growth in 1.25 percent compared to the year 2015. The value of dollar currency abroad had appreciated 20 percent compared to data in 2014, hence to economic stability of dollar assets and expectations from home and foreign monetary policy. In addition, appreciation of dollar has about one-third of its effect on the number of imported goods and lower prices of imported products.

Overall, the financial situation is not proving to be good in condition for the dynamic economic growth. Stabilized economic situation and increase in a real income supported household spending and driving consumer confidence. Since the middle of 2015, financial stability in U.S is average, the same as debt growth in the household sector. Commercial real estate prices and residential home prices have an increasing trend.

3.1.6 **Forex now**

The Bank of International Settlements in their “Triennial Central Bank Survey” from April 2016, defined the main highlights accompanied by recent foreign exchange market development:

- In April 2016, foreign exchange market trading managed to reach 5.1 \$ trillion in a day, which is lower than in 2013 by 0.3 \$ trillions.
- The foreign exchange turnover is increasing thanks to Yen in the last year. However, the spot turnover per day has declined for the first time in 5 years in 0.7 \$ trillion.
- In contrast to U.S dollar, which scored 87.6 percentages among all traders in the world, Euro, Australian dollar and Yen have lost its market shares. The Euro from the second place, reached 31.4 percentages and is lower compared to 2013 by exactly 2 percent. The Japanese Yen has lost 1.4 percent compared to the year 2013. Unexpectedly, the Chinese renminbi doubled their position on the market by reaching 4 percent due to increasing in trade with U.S dollar.
- The main trading centers such as UK, USA, Singapore, Hong Kong and Japan account for 77 percent of the whole exchange trade activity.

The survey also represents the rising popularity of emerging market currencies. In 2013, the Mexican peso was the most popular trading currency among emerging currencies. Its place was overtaken by Chinese renminbi. Their daily trading volume increased in 82 \$ billion, which is representing a 2 percent growth. Overall, Asian regions and other emerging markets are increasing steadily. Despite renminbi, Korean won or Thai baht climbed to second or third position. Mentioned change might be caused by recent decrease of oil prices and subsequently the depreciation of Russian rouble.

As it was mentioned above, five financial centres represent 77 percent of all market activities. Despite the fact, that United Kingdom shares on exchange market has decreased on 3.8 percent, it is remaining to be on the first place with 36.9 percent from all trade. According to the data available in table 3 (appendix), the USA is in second place with 19.5 percent. Asian financial centres are representing 20 percent and they have an increasing trend. The Eurozone shares are falling insignificantly by one percent. Financial centres such as Australia, Canada, Denmark, France, Germany and Switzerland are big as well, but their share on global trading is not exceeding 3 percent barrier.

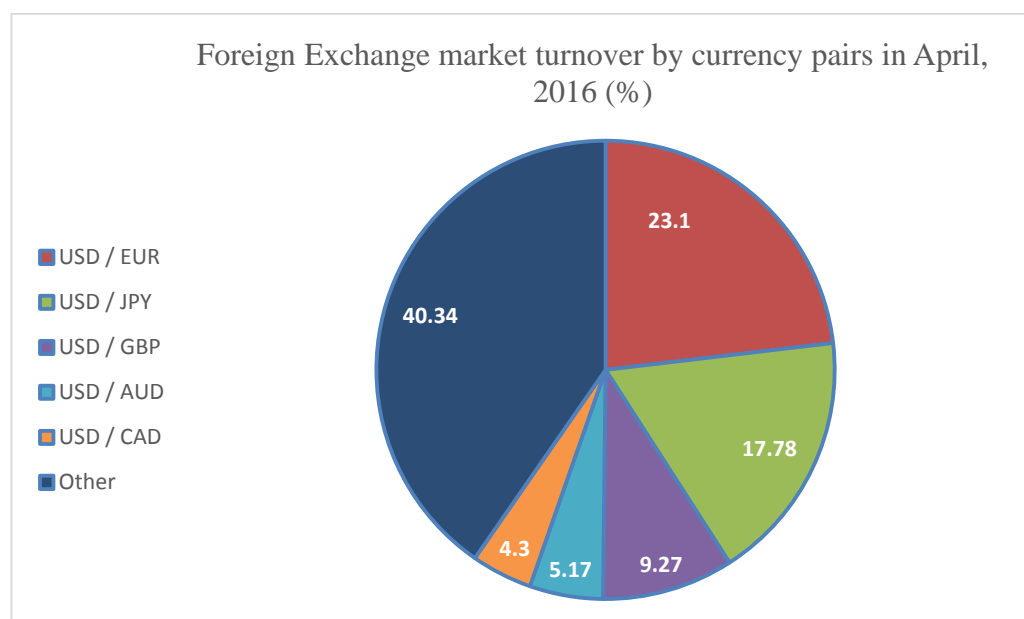
The objective of The Bank of International Settlements (BIS) survey is increase transparency by defining the size and structure of global foreign exchange market. This survey was founded in 1986 and taken every three years. The latest data available is from April, 2016.

The figure below is representing a share of different currency pairs per the market activity or in other words number of transaction made by traders and market liquidity. Traders activity was observed during the April 2016 and it shows outcome of one-months transactions entered in April 2016. Value of trade is measured in the U.S dollar and its exchange rate is taken from the day of observation. As a result, currency pair EUR/USD is the most popular among traders. Both currencies are representing two significant economic centres. Usually, multinational companies have their business in both regions, so they can eliminate their exchange rate risks. After the USA, the Eurozone is the largest economic region. Thus, stable economic growth in the Eurozone and US, EUR/USD is suitable for beginners, this is because it has slow movements compared to other major currencies. Daily range of EUR/USD has around 100 pips, despite crisis period.

According to the working paper of BIS “Downsized FX markets: causes and implications” published in December, 2016, modern FX market is characterized by a decrease in the amount of “fast money” traders and their desire to risk. Due to this trend FX market activity, has dropped significantly. On the other side, non-bank participants of the market gained better position and became liquidity providers. Such changes are making FX more based on individual relationship, than corporations.

For the first time in 15 years, the Forex market global turnover declined to 5.1 trillion U.S dollar per day during April 2016, which is 0.3 trillion less than in April 2013. This trend is caused by less demand on currency trading and low interest rates. However, the number of emerging market economies has increased in its share on the global platform. In particular, the Chinese currency renminbi.

Figure 5 Foreign Exchange market turnover by currency pairs.



Source: Bank for International Settlements, own work, 2016

There are few monetary policy implementations that led to the shift of FX past trends. For example, the Central Bank of Japan bought foreign securities to boom their trading activity, which worked till 2013. At the same time, global attention was turned to the forex scandal in London, 5.3 trillion per day FX market, where brokers front-run their clients.

This means that brokers used the knowledge of customers to execute their personal transactions. In the same month, U.S Reserve Banks implemented Quantitative Easing in

order to boost their economy, but investor and traders panicked and started to withdraw bonds from the market. Another factor that slowed down market activity is further easing of the Japanese bank and the introduction of negative exchange rates by European Central Bank. (Gilbert, 2012)

Besides monetary policy factors, changes in macroeconomic and microeconomic environment has also changed the FX market structure. For example, in 2015 the Swiss Central Bank unpegged the Franc against the Euro. This means, that Central Banks will not strive for the fixed exchange rate of the Franc to Euro. From the point 1.2 Swiss Franc has fallen to 0.85 only in a few days. This situation created panic on the FX market, collapse of the Swiss market, significant losses due to hedge funds and reduction of brokerage clients. On the graph below the results of the Swiss collapse is depicted.

The following situation is caused by investors, hence they considered the Franc and Swiss government as a very trustworthy institution. Increasing the number of investors pushed the price up. Due to a high dependency on Swiss economy on exports (70 percent), the expensive Franc has a negative impact on the spot trading and motivated traders look for other safe heaven. Not only investors were unsatisfied with this measurement, but also individuals blamed their monetary policy for the possible hyperinflation. (The Economist, 2015)

Figure 6 EUR/CHF exchange rates from January 2012 until January 2016



Source: ECB Statistics, 2016

Generally, FX has change in structure, activity trends and overall image. First of all, the structure of the market participants supported by low-risk traders, that are using more sophisticated technical instruments to eliminate loss. The greater predisposition of traders

to participate through the hedge funds, insurance companies or pension funds instead of individual trading led to the popularity of option trading compared to spot trading.

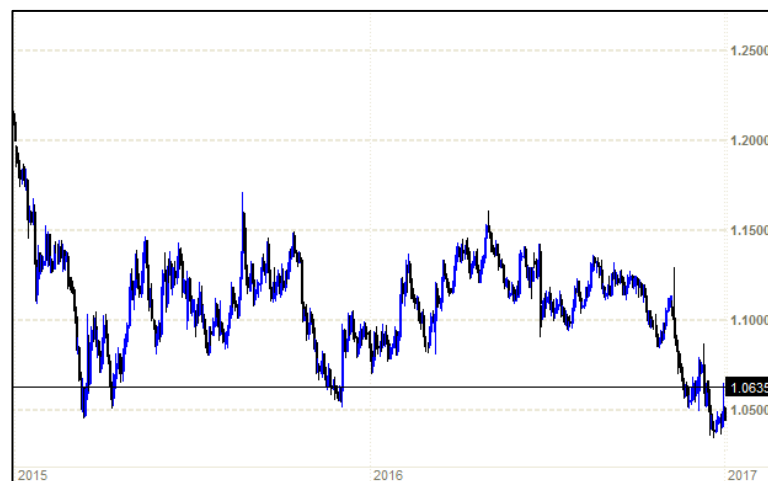
3.1.7 Characteristics of currency pairs on Forex

According to the BIS report from 2016, 88 percent of currencies are traded with USD. Despite this fact, the popularity of the Euro has been declining since the crisis in 2010, it remains to be the second traded currency on the Forex market. The currencies of some emerging markets are following new increasing trend recently.

EUR/USD

One Euro itself worth one Euro in the country of production. To make a speculation, price should be floating. All currencies on forex markets always depends on other currencies. In case of price of Euro, it is important to state how much it cost compare to other currencies. Historically, trading pair EUR/USD is the most popular. In this diploma thesis, analysis made on the currencies pair, where Euro is based currency and American dollar is quote currency. (Jagerson, 2011) The EUR/USD currency pair is popular among traders for its competition between these two currencies.

Figure 7 EUR/USD from January 2015 till January 2017, annual bid



Source: Rumus 1.8.2, own work, 2017.

As it is depicted on the figure above, EUR/USD exchange rate in 2016 is characterized by stability, despite few accessional peaks. For example, in 2010 Eurozone experienced sovereign debt crisis, particularly caused by Ireland, Portugal, Greece and

Cyprus. Overall, the investors did not expect significant interventions from the FED and ECB. The reason for straightening of Euro in 2016 is currency depreciation in emerging markets and their unstable political situation.

The dollar has a long-term tradition in the international trade and it gained significant power after World War II. The introduction of the Euro rapidly changes the position of international monetary systems. However, its role in foreign exchange markets continually declines from 2010 due to debt crisis in amount of 119\$ billion per day. The decline was caused by Eurozone members (Portugal, Ireland, Greece etc.) as they were not able to pay their national debt.

The Euro is impacted mainly by political events, which are in all countries using this currency. For that reason, the exchange rate is characterized by sharp ups and downs. In a single trading session, the movement of exchange rate in a relation to U.S dollar might be more than 200 points and it is not rare situation. This situation is connected to the fact, that the Euro is influenced by news from any Eurozone country. Therefore, it occurs mostly during daytime in Europe. Thus, Germany and France are the biggest economies within Eurozone, economic reports from these countries have a significant impact on exchange rates. The main fundamental factors observed by investors are: ECB decisions and Council meeting, proclaims of ECB president, CPI and PPI reports, unemployment rate, retail sales and sovereign debt statement.

USD/JPY

The pair USD/JPY (U.S dollar/Japanese Yen) takes the second place with regards to the volume of transactions and its share accounts for 17.78 percent (Figure 5). Japanese national currency – Yen has a long and difficult history behind. At the end of World War II, American authorities established exchange rate 360 Yen per U.S dollar. Thanks to the free foreign exchange market conditions, the Yen was able to strengthen significantly against USD. Currently, the exchange rate USD/JPY is approaching the level of 114.62 Yen per one dollar. (<https://www.bloomberg.com/quote/USDJPY:CUR>, 22.01.2017).

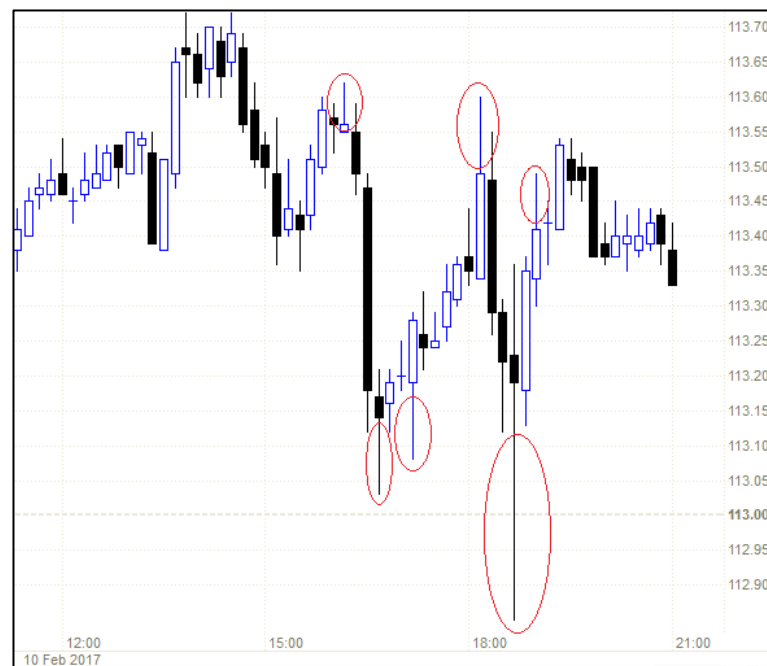
From a monetary point of view, the Central Bank of Japan is characterized by a tendency to pressure official interest rates to zero level. As a result, the national Japanese investors are rather investing in foreign assets in the first place. For instance, US government Treasury bonds are one of the most popular investment tool. Japanese

economy is export oriented economy. Therefore, the “Rising Sun” country’s monetary authorities are considered extremely important to prevent excessive strengthening of the national currency.

The Japanese Yen is recognized as a refuge currency. In periods when the market is searching for risk aversion, it immediately affects the quotation of the pair. In particular, it falls, which means that the Yen is becoming more expensive under the influence of increasing demand from the frightened investors. On the other hand, this currency pair is challenging and requiring patience from the investors, because of its unexpected movements. (Brooks, 2015)

USD/JPY is broadly known for high liquidity. It is suitable for traders, which are preferring to close deals during the night hours in America, because USD/JPY is traded during Asian business hours. One of the important factors to be considered is export reports, because of Japan’s dependency on importation of oil. The Japanese Yen is and indicator for the whole Asian market.

Figure 8 USD/JPY quotation from 10th February, 2017 on 10 minutes bid



Source: Rumus 1.8.4, own work, 2017

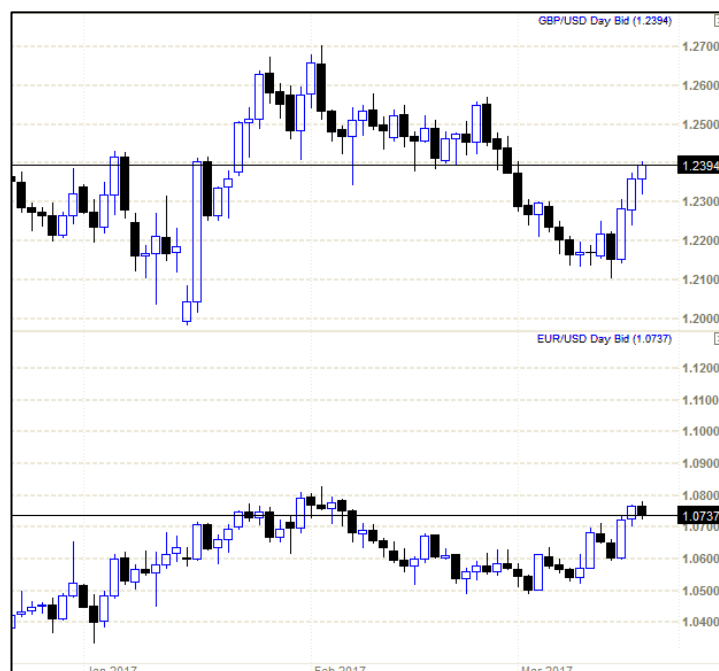
The unpredictability of the USD/JPY is proverbial for a long time already. Drastic and unexpected jumps of the quotes are a usual situation (Figure 8). Prediction of its course is difficult and ungrateful job. On the other hand, the Yen is not characterized as a highly

volatile currency as well. When working with this currency pair, traders cannot be limited only by technical analysis. It is important to take into account the news from the world economy and political sphere. It is noted that USD/JPY is sensitive to the political processes in the United States and Japan. This is due to the fact that a great amount of U.S government debt is held by Japanese investors; Japanese Yen is significantly influenced by news about interest rates in the United States. This pair is not recommended for junior traders, especially during Asian trading sessions.

GBP/USD

GBP/USD is an abbreviation for British Pound and US dollar and it placed on the third place by liquidity among the Forex instruments. It accounts for almost 15 percent of the total Forex turnover. On trader's jargon, this pair is called "cable". The nickname was created back to the days, when the quotes were transferred from Europe to USA through a special cable laid on the bottom of the Atlantic Ocean. UK national currency used to be the leader in the world at the beginning of the twentieth century, but it lost its position after World War II.

Figure 9 Comprising of EUR/USD and GBP/USD, daily bid



Source: Rumus 1.8.4, own work, 2017

GBP/USD is also characterized by moves in sync with the pair EUR/USD. The reason for that is that both GBP and EUR are European currencies and main competitors

of USD. It does not mean that every candle of EUR/USD will automatically be illustrated on the graph of GBP/USD. However, traders can see from the figure 9, that trends are identical for both currency pairs. The reason for such similarities is that both pairs are shaped by the same set of indicators. The relative appreciation of British Pound of U.S dollar mainly depends on interest rates.

It is generally believed, that this pair has good predictability, but junior traders are not able to cope with it due to the already mentioned high volatility. On the other hand, GBP/USD might bring higher profits compare to the calm pairs. The popularity of British Pound is caused by historical power of Britain in the past. The British Pound used to have first place in government reserves, before the U.S dollar was implemented.

It is a popular currency pair among traders because of often high fluctuations and instability. Professional traders are preferring to use short-term and ambitions strategies, as GBD/USD is reacting very fast on macroeconomic data about the British economy and reports from the Bank of England, the European central bank and the US Federal Reserve System. In terms of fundamental analysis, the Pound and dollar are very sensitive especially to news about inflation and unemployment rates. This pair is quite complicated in terms of technical analysis, as the support and resistance lines are not visible as for example in EUR/USD.

USD/CHF

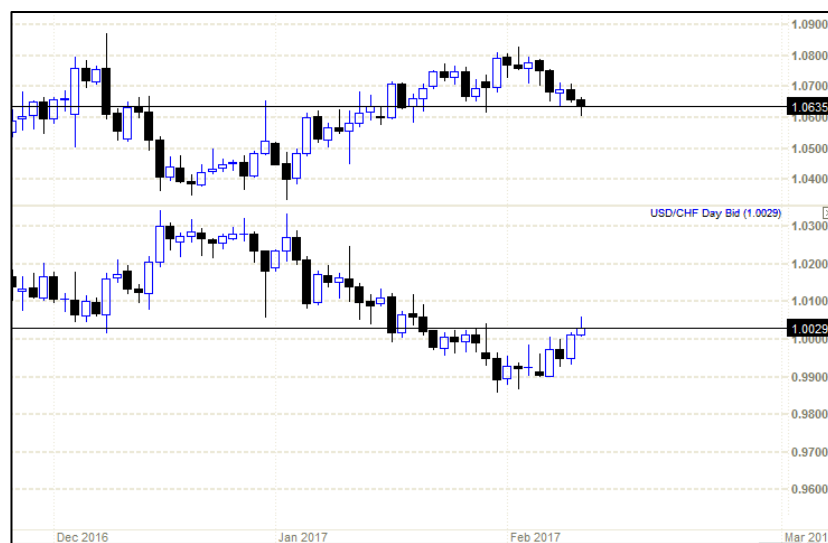
The currency pair USD/CHF (U.S dollar/Swiss Franc) is one of the four major according to the volume of transactions. Daily trading volume for this pair accounts for 5 percent of the total volume of trading on the global currency market Forex. Despite the situation on the market in 2015, the Swiss Franc, which is on the trading slang also called “Swiss”, surely ranks among the five major currencies due to the special status of Switzerland as a neutral state and global protection of financial resources. According to experts, in the Swiss banks are allocated a third of all private assets of the world. During the “Cold War”, Switzerland strengthened its position as a neutral-state or shelter, thus the Swiss Franc gained the status of being a “safe” currency.

The pair USD/CHF is characterized by low liquidity, a strong tendency to unidirectional movements and high volatility. In terms of technical analysis, the pair is quite complicated, because it shows a lot of false signals, such as false breaks of support

and resistance levels. Swiss Franc might, without any alarming signals, break stop-loss (channel support line) and go down 20 points and then go back to the channel and continue its previous trend. The Swiss Franc is characterized by relative stability. However, during international crises it becomes extremely difficult to predict. In addition, during the volatility periods, The Swiss Franc shows noticeable correlation to the Euro.

Another important feature of the pair USD/CHF is that it mirrors correlations of EUR/USD. By comparing both graphs, it is obvious that, when EUR/USD increases, USD/CHF decreases and vice versa. This situation influenced by tight trading relationships between Switzerland and European countries, its national economy is dependent on European market and politics. The mirroring of charts is happening in the both directions. Sometimes USD/CHF movements are transferred to EUR/USD charts later and sometimes EUR/USD gives the trend position first.

Figure 10 EUR/USD and USD/CHF from December 2016 till February 2017



Source: Rumus 1.8.4, own work, 2017

In terms of fundamental analysis, news from Switzerland itself has secondary importance. The trend of exchange rates is more impacted by news from United States.

AUD/USD

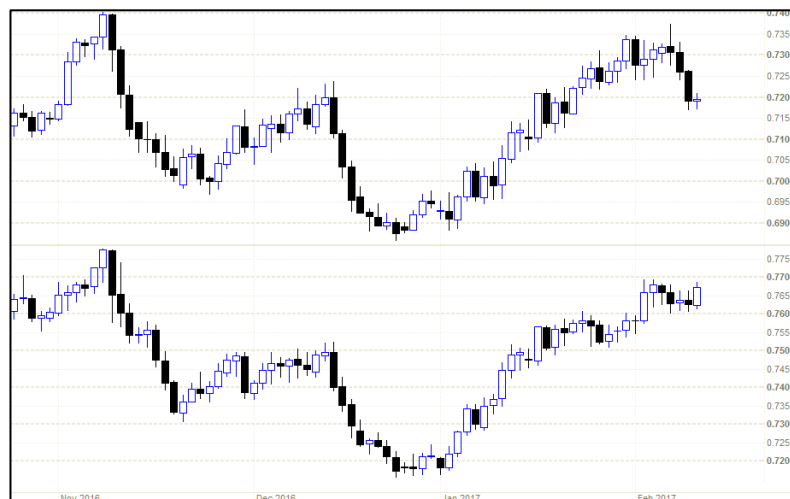
The pair AUD/USD (Australian dollar/U. S dollar) is not on the four basic currencies, nevertheless, is quite popular among traders. It is generally believed, that this pair is well suited for trading techniques focused on active use of technical analysis. The AUD/USD has stable dynamics, good predictability and average volatility.

Australia is a country with generally high interests rate level. Differential interest rate between Australia and United States is in favor of the Australian currency growth, as a result in 2009-2010 it had an increasing trend. The Bank of Australia is trying to stimulate this interest rate, in order to attract “cheap” funds to industries unrelated to mining investments, to pay attention to only natural resources, but also in general to other sectors of the Australian economy. In terms of GDP, Australian economy is not in a group of largest economies even in the Asia-Pacific region. Nevertheless, as a percentage of GDP per capita, Australia can compete with developed European countries. (Brooks, 2015)

Australia is major exporter of minerals and agricultural products with a large share in mining sector. Export of metals is an important source of income in this country. Due to this fact, the global market demand for metals has a significant impact on the Australian dollar, which makes it a part of the so-called “commodity” currencies. In general, the economies of leading importers of Australian raw materials, such as Japan and China, have a significant impact on AUD rate dynamics. In addition, unfavorable weather conditions in Australia also causes a depreciation of the local currency.

The exchange rate charts are showing twin relationships with their neighboring country of New Zealand. Charts of currency pair NZD/USD (New Zealand/U. S dollar) are usually behaving very similar to the chart AUD/USD as it is shown on the graph below.

Figure 11 NZD/USD and AUD/USD from November till February 2017



Source: Rumus 1.8.4, own work, 2017

On trader’s slang, the Australian dollar often referred as “Aussies”. Work with this currency pair is recommended to the new traders, who are just becoming familiar with

Forex mechanism. Effective strategy for this currency pair is based on fundamental analysis and observation of main events in economic calendars. In addition, this currency pair classic strategy works based on following the main trend.

USD/CAD

USD/CAD quotation is showing the price of the U.S. Dollar to Canadian Dollar. It is in top ten most popular currencies on the Forex market and often selected by fundamental traders. Canadian dollar is an example of commodity currency, especially in relation to oil market. Canada is one of the leading economies in the world and takes an important place in energy exports. The oil industry is an important sector of Canadian economy, as its reserves put Canada on the second place after Saudi Arabia.

It is obvious that Canada very much depends on world market conditions around the “black gold” price level. While oil becomes more expensive, the Canadian dollar is also rising in price accordingly and it is displayed on USD/CAD as decreasing trend. Thus traders, who are interested in this currency should track and predict the dynamics of energy prices. This currency pair is not suggested for beginners.

Another important aspect of USD/CAD analysis is geographical focus of Canadian export on one country. Nearly 85 percent of Canadian export goes to neighboring country – United States. When there is recession in the USA, demand for Canadian export drops, which is effecting the quotation of USD/CAD. With regards to this fact, there is inverse correlation between the rate of the currency pair and U.S stock indexes. Overall, USD/CAD is a relatively quiet currency pair with average volatility.

3.2 Types of analysis

There are few factors, which are influencing currency movements. The Forex market is sentimental and influenced not only by what already happened, but also by something what will happen in the future. In other words, it significantly depends on trader’s expectations. The main goal of traders is to find techniques, which will prevent them from losses as much as possible. In that case, even a technique which brings trader on zero level may be considered successful. Zero level means that in the end of all transactions, the trader has the same amount of money as was invested in the beginning of their trading. In addition, if traders expect some big news then the effect of this news might be much

smaller than it should be. It is happening, because the market is prepared for changes. For example, everybody expecting the Federal Reserve System to raise interest rate in 2017, which should have appreciated the dollar. However, because everybody count with this increase long time upfront, there will be no appreciation.

The techniques, which traders are using can be divided into two main categories: technical and fundamental. Fundamental analysis is involving the evaluation of macroeconomic data like P/E ratio, import or export results. On the other hand, technical analysts are evaluation prices from a historical point of view, by implementing charts and trends analysis. It is a great debate on which approach is better. These two approaches are traditionally taken as opposites, since technicians concern lay in the question *when* something will happen, but fundamental analysts are concerned about the question of *why* it is happening. The following discussion is open already for many years, but the answer is still not clear. Apparently, the tools which traders are using are fully individual and both analysis are important. (Schwager, 1999)

3.2.1 **Technical analysis**

“Technical analysis is a method of studying prices, where the main instruments are graphics.” (Achelis, 2005) Technical analysis assume that the market has a memory. This means that the future movements of exchange rates are significantly influenced by past behaviour. In other words, the market “remembers” how to behave in a certain situation, as markets are cyclic and it could happen again next time. The graphics and charts of this analysis are the object of the study, reflecting the behaviour of prices. On charts, technicians are drawing standard elements and based on that building behaviour prediction.

First element is a trend line, it is an indicator which is determining direction and tempo of decrease/increase of prices. Another important element is channel – range of price fluctuations. The lower boundary of the channel forms a support line and top boundary forms resistance line. From these elements traders are building specific shapes such as triangle, wedge, “head and shoulders”, double top and double bottom, flags and others. These figures are like guideline for the trader.

The charts of candles are also form various standard figures. Perhaps, the top philosophical principle of technical analysis is the concept of Elliot waves. According to

this theory, any kind of price movement is characterized by cyclicity, each cycle consists of three stages of increase, which are separated by two stages of decrease.

With the help of computers and modern software, traders are evaluating graphs mathematically. It is allowing them to receive additional information about market trends. The whole procedure could be automatized and consist of several dozen statistical measures of price changes and indicators. An indicator is understood as special graphics that are based on historical data.

The key assumptions, on which technical analysis is based, formulated in the form of three following postulates (Murphy, 1999):

- Markets take everything into consideration. In other words, the price is comprehensive reflection and result of all market drivers.
- Price movements are subordinated by trends. Market life is a complex of alternate periods of decrease and increase, inside of each period the main tendency is developing until the market starts to move backwards.
- History repeats itself. Often the key to understanding of the future lies in the study of the past. It has long been observed that certain configurations on price charts tend to show up consistently and repeatedly. Repetition occurs in different markets and in different time scales. It is a consequence of the stereotype human actions or a certain behavior and characteristic of the human psyche.

To sum up, the justification performance of methods technical analysis lies in the peculiarities of human psychology and the existence of stereotypes of their behaviour on the market. Approximately the same set of factors, influencing the decision to purchase and sell foreign currency leads each time to a similar result - the appearance of repetitive exchange rate movements.

3.2.2 **Fundamental analysis**

The main difference between fundamental and technical analysis on the Forex as well as fundamental analysis lay in following statement: the price of currency on the Forex market is a reflection of supply and demand, which are dependent on fundamental economic factors. The followers of the technical analysis think that there is no reason to

look for causes of changes in the currency pairs and it is sufficient to analyze only prices themselves. It is assumed that it is impossible to find a reason for price changes, before the market will include it in its quotation already.

“Fundamental analysis is a method of evaluating a stock by attempting to measure its intrinsic value. Fundamental analysis study everything from the overall economy and industry conditions, to the financial condition and mismanagement of the companies.”
(Naveen, 2015)

Technical analysis in most cases engaged in short time intervals, from a minute to a week. Fundamental analysis in these timeframes are useless, because data and news are usually published once a week, month, quarter. However, if the purpose of analysis is the forecasting of medium and long-term prognosis, it is already becoming necessary to conduct studies on the root causes of the changes in exchange rates. Only this type of analysis will provide an opportunity to assess the prospects of the dynamics of supply and demand on the currency. In addition, this approach will give to investor the opportunity not be biased by short-term fluctuations, but see a whole picture on the market.

The main drawback of the fundamental analysis on forex is its complexity. The change in only one indicator that can be caused from 10 to 20 interconnections, but trader is operating with 50 of them only for one country. Many of them are contrary to each other or reflexive. For that reason, forex fundamental analysis is used by 10-20 percent of the traders and the majority of them using it on surface level. In addition, as mentioned above, fundamental analysis is almost useless for short-term trading, which means that its use imposes a limit on the amount of trader's money. The trader will not have enough money for opening position in multiply pieces or install a right stop order.

Factors which are influencing forming of supply and demand for currency can be divided into several groups:

- Movement of trade and capital investments. These indicators are looking at export-import activities of the country.
- State of the financial market. These parameters are characterizing potential return on investments, current or potential demand for the currency. As an example, traders are using such indicators as amount of U.S Treasury bonds, dynamics of interest rates, dynamics of mortgage rates.

- Aggregate macroeconomics indicators are illustrating the state of the economy as a whole and economic growth. The most popular indicators are GDP, public spending, cumulative consumption, volume of export or import and unemployment.
- Dynamics of industries and trade. For example, retail sales index, volume of consumer credits, index of industrial production.
- Labor statistics are characterizing workforce sector and future potential demand. Labor productivity, employment or unemployment are widely used by traders.
- Inflation Indicators. Inflation identifies how a country's monetary decisions are influencing currency. For example, PPI, CPI, average hourly wage or index of labor costs.
- Indicators of monetary regulations are the core of every fundamental analysis. They indicate current policy conditions of economy and future development of the country.

3.3 Limitation of prognosis

Trading on forex has many advantages and gives many opportunities to traders from all over the world to gain a profit from it. Nevertheless, currency exchange rates are not fully predictable, because there is a significant number of factors which might influence it. Sometimes, even a correct prognosis of currency quotations does not guarantee profit. The transparency on the forex market is high, but traders are operating through the mediator – broker. Brokers are providing specific data to the traders and realizing their orders. Due to this fact, the execution of trader's decisions is highly impacted by brokers professionalism and honesty.

The Forex market is known for its high volatility. Fundamental analysis is based macro-economic and political development. Traders can only expect some development and follow the trends. In addition, expectations of the traders already formulate prices on forex. For instance, currency pair CHF/EUR was always highly stable and continuing to be trustworthy nowadays. Traders tempt to make their savings in this currency pair. Nevertheless, when the Swiss government decided to not keep fix exchange rates in 2012,

this caused a tremendous losses for investors. During this period, investors could only observe the situation, they could not predict it or influence it in any way. The only way is to keep a strict and systematic strategy with stop losses.

In addition to overall forex market limitations, technical analysis has some as well. Occasionally, technical indicators are showing opposite directions. One might indicate a signal for buying and another for selling the currency. Therefore, it is important to develop a trading strategy with involvement of different indicators groups.

The accuracy of technical analysis is not absolute. For that reason, the enter signal does not guarantee success trading session or profits. Market trend might change right after entry or right after exit. Besides the accuracy of indicators, interpretation is also an important piece of analysis. One analyst might understand the same signal in the different way, it also depends on trading strategies as well. In addition, indicators might show the analysis, which is already taking place. In that case, the trader will open or close their position too late.

Most of the technical indicators have specific limitation. For example, Average Directional Indicator shows signals after particular trend already started. This disadvantage is caused by mathematic specification of ADX. Indicator consists from the lowest prices two candles (-DX) and highest prices of the candles (+DX). The ADX curve is able to identify trend after +DX is bigger than -DX or opposite. For that reason, even if the trend has already started, ADX curve will show results after the cross of both lines.

4. Practical Part

4.1 Technical analysis

4.1.1 Chart analysis

Charts are the main instrument of technicians, because they are able to “read” and base their analysis on it. Charts provide identical data, but are shown differently. Depending on what kind of output technicians searching for, they are using various graphs. Steven Achelis has distinguished in his book three main types of charts:

Line charts A line chart is the simplest form of graph, because it is showing only closing prices during some period of time. It does not provide information on high, low or opening process.

Figure 12 Line chart EUR/USD from January till February 2017, day bid



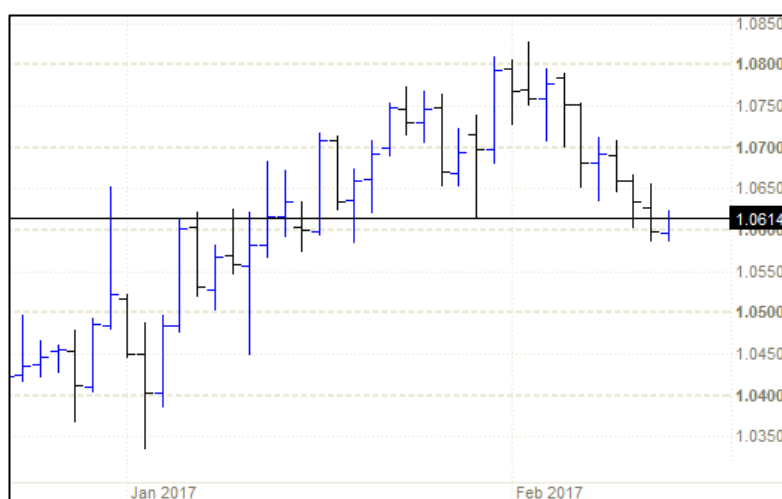
Source: Rumus 1.8.4, own work, 2017

The horizontal line on the graph above represents monthly timeframe from November 1st 2014 till November 1st 2016, while vertical line display prices of currency pair EUR/USD. Each point on the chart is reflecting price equal to the closing price. This type of graphs is recommended to traders for the short-time analysis, as it does not provide essential information on the long term future.

Bar Charts. Bar Charts are providing more sophisticated information about price changes. It displays the following additional characteristics – opening price, closing price, maximum and minimum price for given time period.

Below the graph is demonstrated by vertical lines with two dashes, with one turned to the left and another to the right. The first is representing the opening price – prices at which transaction occur at the beginning of the period. The second dash is showing closing price. There are also vertical stripes, which are demonstrating maximum and minimum value of the investigated period.

Figure 13 Bar chart EUR/USD from January till February, 2017, day bid



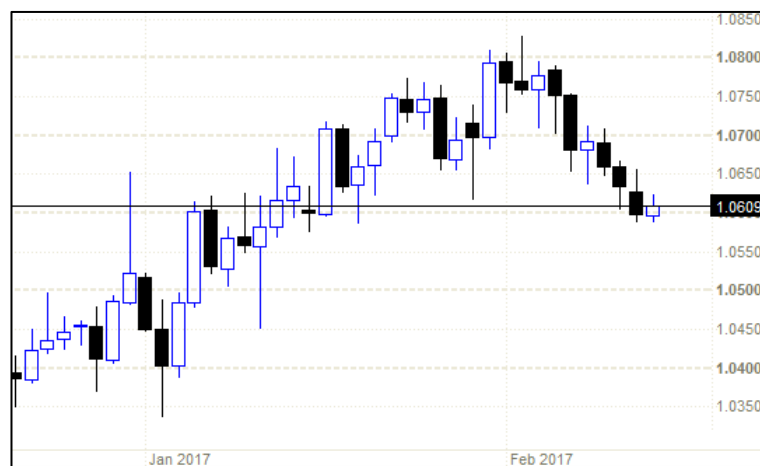
Source: Rumus 1.8.4, own work, 2017

One column is representing one hour. Size of column is defining volume of activity between buyers and sellers. A small bar shows that there is peace and harmony on the market and there is only a little disagreement about the price. In addition, this graph allows traders to understand whether the opening/closing price occurred closer to the lowest or highest price.

Compared to the line charts, bar charts are more convenient and informative, since it is providing information about the price in a compressed form. In addition, the trader is able to recognize price gaps. If the distance between High and Low is small, the markets situation is uncertain, therefore it is better to refrain from entering the market. However, it is complicated to analyze significant number of time periods at once. In that case, traders are switching to candlestick graphs. Bar charts are more convenient for analyzing short intervals of price changes as daily intervals (D1). Despite the fact that the bar chart allows to see range of price changes in the period, it does not show character of price movements within the period of time. To do so, analytics have to switch to smaller timeframes.

Candlestick charts. Candlestick charts are one of the methods of technical analysis, which was used in Japan for forecasting rice prices. Steven Nison is considered as a leading expert in interpretation of these charts. Candles are representing the same information as bar chart, but compared to the bar chart it gives a more transparent understanding of the relationship between opening and closing prices. Candlestick charts are another way to monitor the dynamics of prices, they do not require any calculations. Each candle simply represents one period of time.

Figure 14 Candlestick chart EUR/USD from January till February 2017, day bid



Source: Rumus 1.8.4, own work, 2017

The graphics above has an hour timeline, where each candle represents one hour. The range between the opening and closing prices represented in a form of rectangle – a candle body. If the opening and closing prices are equal, then the candle body is shown as a horizontal bar, and the candle itself as a cross. As an example, the last candle on the graph above from November 21st at 1:00 had differences equal to 0,00001 point. If the closing price above the opening price (market growth), the body of the candle has white colour. If the closing price is below the opening price (market decline), the body of the candle has a black colour. Modern trading software are allowing to set up any possible colour individually.

Vertical segments below and above the body of the candle called "shadow". The longer the shadow, the weaker market potential, that market will go in this direction. For example, the long upper shadow indicates unwillingness of traders to buy more of certain currency (go up).

4.1.2 Trend

Trend is the core of technical analysis. *“Market moves are characterized by a series of zigzags. These zigzags resemble a series of successive waves with fairly obvious peaks and troughs. It is the direction of those peaks and troughs that constitutes market trends.”* (Murphy, 1999) The fact that price is characterized by zigzags makes people think that it has only increasing and decreasing trends. Nevertheless, the market is moving in a sideways direction as well.

Traders often using an impression as “trend is your friend”, referring to the importance of following the trend, not facing it. Charles Dow was one of the first, who started using trend analysis. He believed that trends are helping to make analysis without including “market noise”. The market could be influenced by news and change the direction, but in the end it will go back to the trend.

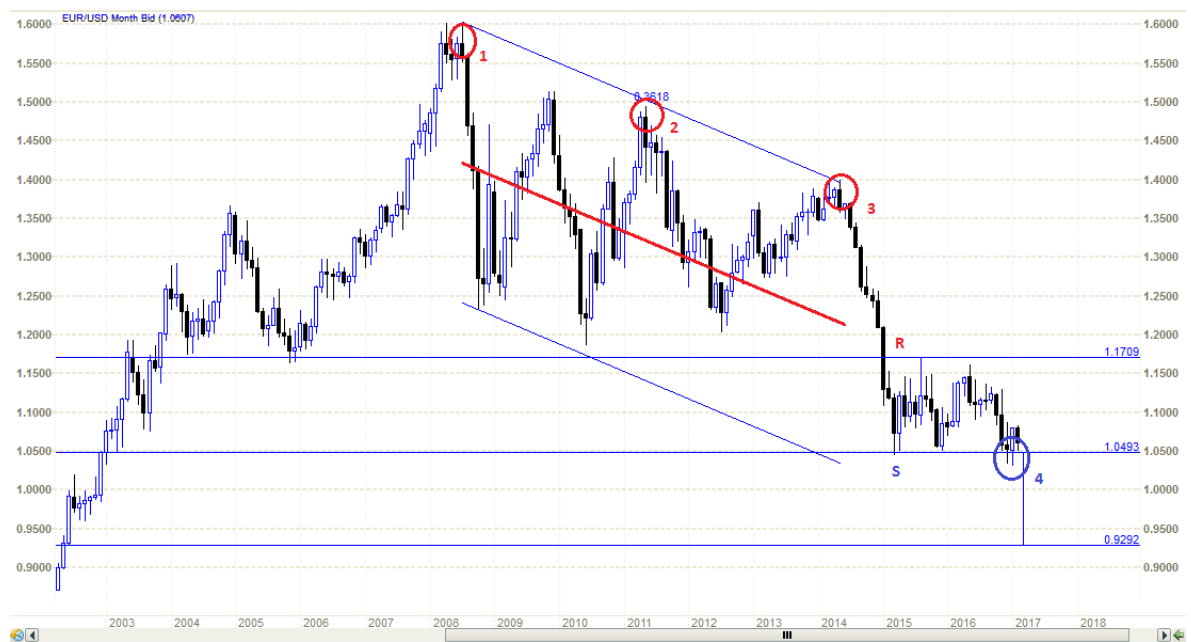
Besides three main directions, trend is classified in three categories. The first called *major trend*. According to the Charles Dow the main trend is effective for longer than one year. *Intermediate* trends are taking place from three weeks to few months. The last group, *near term trend* are all trends shorter than 3 weeks. Every shorter trend is the part of the longer one. The market can take a break in a few months, as an example.

Another important definition for the trend analysis is *trend correction*. Trend correction is movement against direction of the previous trend, but without exceeding the magnitude of the previous trend. If we consider the trend as the movement caused by changes in the factors underlying in supply and demand, correction is a phenomenon, which returns process in “the right direction”, not giving market to get “carried away” and deviate from the fundamental factors.

Trend line. Trend line is a tool with which a trader can determine the current valid trend on the market. To define the character of a trend, it is important to follow the definition. If every next peak is higher than the previous one, the trend has upside direction. If every next peak is lower than the previous one, the trend has downside direction. If peaks and troughs are on the same level, the trend has a horizontal direction. Ascending trends are also called profit taking. Sometimes this phenomenon can also be described as long or buy position. Traders are satisfied with growth of the currency exchange rate and begin massively close positions to sell the currency for the purpose of

quick fixing their profits. However, of the underlying causes of the increased demand for the specific currency has not changed, then the purchase of the currency will resume again and the rate will exceed the previous maximum value. In that case, the course of the movement takes direction or trend. There is a specific reason why bull traders are calling their operations long term. It is generally believed that currency is growing very slowly, but falling very fast. If it is growing, then bull traders wait till it will reach point and they could immediately sell the currency (take the profit). Due to this immediate sell, currency is falling faster. For instance, on the figure 15 the EUR is appreciating from December, 2005 till June, 2008, but it was falling rapidly from July 2008 till November 2008. It took the EUR two and a half years to grow and only five months to fall.

Figure 15 EUR/USD chart, month bid from 2014 till February 2017



Source: Rumus 1.8.4, own work, 2017

For building a trend line we need only two points on the graph. The first action for building a trend line is recognition of peaks on the graph. The peak is represented by a candle, which is higher than the candle on the right and left side. For instance, on figure 11 the candle from July, 2008 is higher than the candle representing June, 2008 and August, 2008. This point is the first peak, which will be used for trend definition. The second peak is marked by the red number 3. Peak 1 and peak 3 are two points of trend. At that moment, by connecting these two points, it is can be said that EUR/USD has a decreasing trend

from 2008 till 2015. Technicians are often using the third point for confirming the trend. Such a point is marked on the figure 15, as red number 2.

For the complete technical analysis, it is important to have overview on the whole picture, since every smaller trend is the part of the bigger one. As EUR/USD currency pair is relatively young, the graph is represented few major trends and few significant falls. The first significant trend is taking place from 1992 till 2000. In this time range, EUR was steadily declining thanks to fundamental factors. The lowest value of EUR to USD dated in November 2000. At that time, month 1 EUR cost only 0.8225 USD. (Appendix 1) So far, it is the only moment when the EUR was cheaper than the USD. Low cost of the EUR in the 2000's does not illustrate purely economic situation of the European countries, as it was the first time the Euro was implemented and marked needed a time to give it a value.

Since 2001 till 2008 EUR/USD currency pair had increasing trend. Currency exchange rates are mapping the economic situation in European countries during this period. For instance, GDP in EU-15 has grown to 70 percent since 1970. However, the growth rates were higher than in United States. This fact is explained by amount of human capital in Europe, despite lower productivity and a higher unemployment rate. The economic situation was not equivalent within all countries of European Union. The main recession was caused by Portugal, Spain and Greece. On the other hand, new member states from 2004 have shown acceleration of their economic position on the global market, as well as Germany.

In 2008 Europe similarly to the whole world faced an extreme crisis, unseen since post-war economic situation. The crisis was driven by increases in credit, heavy liquidity problems and a massive bubble in the real estate sector. Such causes already had heavy consequences in Asia, but this economic recession had a global impact. Banks experienced great liquidity problems and uncertainty. Due to the strong export growth, business development, it was believed that European economy would be more resistant to economics collapse than the US economy. In the end, foreign exchange markets also responded to the crisis by falling more than 300 points.

The financial crisis forced Forex traders to panic, because of increased of risks. Behavior of traders changed, as they started to implement wider spreads and trade on a smaller volume. The major surprise for traders was appreciation of the USD and particular

advantages for Swaziland and Japan. These three currencies were not the center of the disaster. Another unexpected event was a relatively fast come back of the damaged currencies.

One more peak illustrated on the Figure 15 reflecting exchange markets fell in August 2011, which was also strong as in 2008. The EU debt crisis placed the US economy in leading position. In addition, European Central Banks had decided to buy Greek, Spanish and Italian debt causing panic among the traders. The U.S Federal Reserves also added contribution to the crisis, by having a high budget deficit three years in a row.

The third peak in 2014 is characterized by unequal economic development among global regions, a generally weak situation in the global trade, falling of commodity prices and especially oil prices. Mentioned weak position of trade and overall weak economic activity moved from developed countries to emerging markets. The fall of commodity prices, energy commodities in particular, contributed to the stagnation of developed and emerging economies. In the Euro expression, oil prices declined by 41 percent, and by almost 50 percent in U.S dollar equivalent accordingly. Not least position has in it Ukraine conflict and sanctions against Russia. Overall, world trade was uncertain during 2014. All factors listed above had a negative impact on the Euro exchange rate.

As it was stated above, the trend line has three directions. From 2008 till 2015, EUR had declining direction compare to USD. It means that the EUR is depreciating compare to the USD and as a result the USD became more expensive compared to EUR.

For the past two years' exchange rates between EUR and USD were characterized by correction. Exchange rates are moving in the range or process between 1.1709 and 1.0493 of U.S dollar for one Euro. It is relatively wide corridor for the hour trader's point of view. However, from the month bid chart, the corridor is relatively small and the price is getting closer to the support line. These recent movements of EUR/USD and bear mood on the market are caused by quantitative-easing programs planned by the European Central Bank in March 2017. The ECB is planning to launch a bond-buying program for amount of 80 billion Euros. The purchase might be separated in 10 billion per month payments. The final decision of ECB will depend on the Eurozone economic performance. From the long-term perspective fundamental indicators (strength of the labor market, strong manufacturing, increase in interest rates) shows support for dollar.

Support and Resistance line

Resistance line is only psychological level, which is considered by a significant number of traders as favorable in terms of sale of foreign currency. Such a consensus among a large group of people leads to the fact that all participants of the market begin to sell currency, through the places or pre-placed orders. The massive placement of orders and as a result massive sales, push prices from the invisible line to the level of support line.

Support line, by contrast, is seen by the trader as the level at which it is beneficial to purchase the currency. As a result, at that point they are buying through the orders. The example of such a line is illustrated on the Figure 15, by red sign R (resistance) and blue sign S (support). Subsequently, accumulation of orders is located not at the same price level, but on the certain price zone, forming by this nor precise level of support and resistance. Placement of similar orders in the same areas is caused by fact that traders are using similar technical analysis, calculating approximately the same level of buy and sell points. (Rockefeller, 2002)

When the price is coming out from the price range or from the side channel, usually it has an accelerated movement. Consequently, after hitting the resistance line, indicators will alarm for buying signal and after the hitting of support line for selling signal. Following signals are considered as opening and closing of position. However, even if the price did not cross the R/S lines, traders can use the knowledge of technical analysis for deals. For instance, if trader is aware that news is not strong enough to break the channel, he or she would sell currency every time it is going closer resistance line and buy the currency every time is going closer to support line. There are particular technical indicators, which can calculate the exact moment of opening and closing position or entry/exits points. With knowledge of these indicators, traders will not consider the break of channel earlier that it would happen and will make a profit even during side-trend of the currency.

Support and resistance lines are built on the same principle as a trend line. First, it is necessary to find two points and confirm it by third point. For analysis of EUR/USD in the last few years few points were used. First peak was on March 2015, when price of one Euro was equal to 1.0493 U.S. dollar. The second point took place on December 2015 when the price of Euro was equal to 1.0567. Based on these two dots, support line can be

build. On the Figure 15 the support line is represented by the value of 1.0493. Next step for building price channel is to find the highest point of the trend. In case of EUR/USD analysis for the past three years, the highest point (Figure 15) was in August 2015 at the level of 1.1709. R/S lines are built by fixing these two levels on the graph.

After the building of resistance and support line traders would place their orders in order to take a profit every time the price will get closer to 1.1709 and buy Euro every time it is getting closer to the level 1.0493. This strategy is working till the trader will receive the signal that the tunnel might be crashed by price. It is important to recognize the exact moment of exit from the tunnel. On the Figure 15 two signals illustrated. First, is the rule that if the price is not able to reach the middle of the channel, then we can expect that it will fall rapidly. From December 2016, price of the Euro did not reach the middle of channel and it is assumed, the Euro will not be strong enough to go up again.

The point number 4 marked on Figure 15 called “Two days’ rule”. The most common channel breakdown criterion is the closing price of candle, which make it breakdown. Sometimes traders refer to such situation as a break out. If the price on the day of the breakdown closed below the support line it could mean the beginning of a turn down. Nevertheless, for traders such a signal is not sufficient enough, they are waiting for the price to be closed two days beyond the support line in a row. The criterion is called “The rule of two days” and it is, in a way, a temporal filter. Despite the fact that the name of rule refers to days and applicable for day traders, all tools of technical analysis are relevant for the different time series. This rule was developed many years ago, when traders were working only on the daily charts. In this diploma thesis only monthly bids are used, where every candle represents only one month.

Trader have to know not only when the price will break the channel, but for how long it will fall. Thanks to the rule of two days and channel analysis, it can have expected to be broken in the next few months. Technicians also look at a range of the tunnel to decide if there will be the next support line, where they will need to buy again. Technicians are assuming that the price will fall on the same amount of points as the channel has. The difference between 1.1709 and 1.0493 is equal to 0.1216 points. If we would assume that price will fall on this amount of points in the next few months, then the new support line can be build. As it is shown on the Figure 15, new support lines would be based on the

level of 0.9292. This position will be a signal for starting to buy again. The idea of support and resistance lines is the most popular tool for all technicians and it is especially useful for new traders on Forex.

4.1.3 **Fibonacci Indicator**

One of the most common and effective technical tools used by traders for technical analysis on the Forex market and for definition of the significant technical levels are Fibonacci levels. Fibonacci levels were discovered by the Italian mathematician Leonardo Fibonacci in the study of the sequence of the numbers 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55. Each number is the sum of the previous two numbers. Dividing any number of the sequence by previous number always will turn into the ration equal to 1.618, which is called the “golden ratio” and determines harmonic proportion.

For practical use in the trade, traders are using only a few numbers, such as Fibonacci retracement levels (23,6%, 38.2%, 61.8%, 76,4%) or Fibonacci extensions (38.2%, 61.8%, 100%, 138.2%, 161.8%). Fibonacci extensions are transferred to a percentage for more efficient usage. Based on this sequence, trading terminals have built many different indicators like Fibonacci retracement, lines, arcs, fan and time zones.

Almost all of the modern trading platforms have already automatic tools for calculating Fibonacci numbers, it is enough only to click on the instrument and put it on the graph. There are also wide variety of computer programs to calculate the values of the Fibonacci level on the Forex market.

Usage of Fibonacci levels on Forex market allows a trader to analyze the price movements. First of all, they can be used to identify support and resistance levels. Second of all, it is possible to determine the size of the correction which started movement of the price. The price is following all the rules of Fibonacci significant levels. For example, if traders see, that the price is getting closer to the Fibonacci level, they can assume the high probability of possible reversal of the trend. Every trend is accompanied with setbacks at some point of time, Fibonacci retracement levels are easy determining the retracement levels, as well as determining the end of retracement and moment, when trends will continue its movement.

Fibonacci levels clearly show the relationship between the trend and correction with potential recovery of 38, 50 and 63 percentages, by forming a primary level of correction. Application of Fibonacci grid allows traders to see how the key price levels intersect with Fibonacci levels. This match of chart models and Fibonacci levels is detecting the main enter/exit levels on the market. Accordingly, trader would consider the opening or closing of position after breakdown of these levels. (Boroden, 2008)

It is important to consider timeframe during the analysis. The main rule is, the larger the time interval, the more important the Fibonacci levels are and the stronger effect they will have. These lines are widely used by traders to determine levels of both orders, take profit or stop loss. In that case, stop loss order is better to be placed on the level of Fibonacci, but take profit is recommended to be placed on the extension levels. It is necessary to mention that if support and resistance level are the same as Fibonacci level, it is additional evidence of the significance of these levels. Many different trading strategies are built based on mentioned levels. However, this tool is not always interpreted clearly with price movements. Sometimes, these levels are not confirmed by the market, therefore the optimum option is to use it in combination with other technical analysis tools.

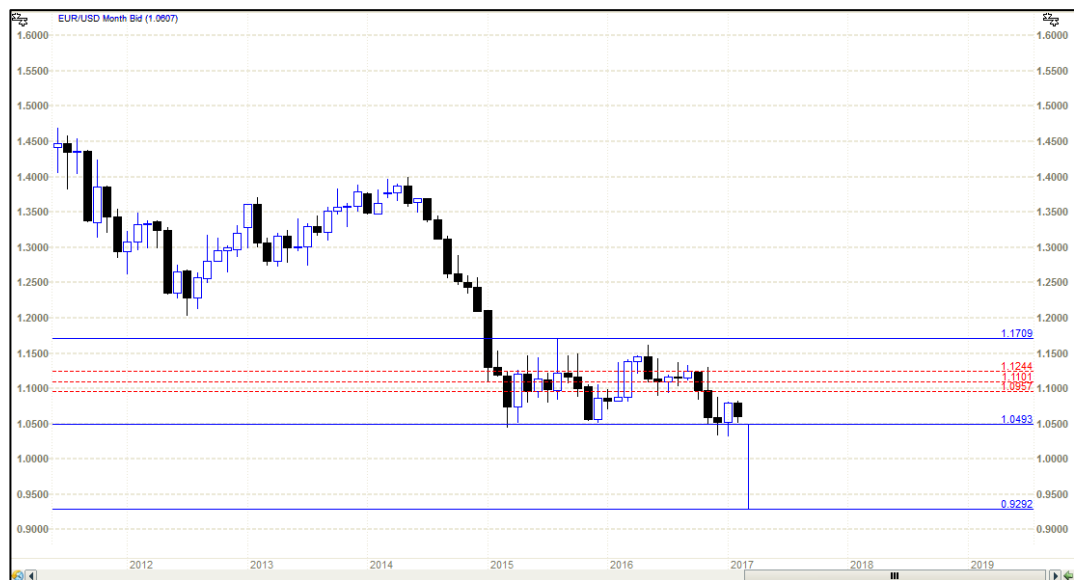
Fibonacci numbers are potentially important levels. Traders are using levels of 38, 50 and 62 percent for deciding where to open or close deal. However, levels are not defining the goal of the price. Prices can easily cross the level and continue its previous movement, in this case it will not receive enough of support from the previous level. The result of Fibonacci Indicator is more effective in combination with other graphical tools such as trade channels, moving averages or reversal models.

Fibonacci retracement

Fibonacci retracement is one of the tools based on Fibonacci levels, which aimed to determine correction within the price channel. One of the ways how to use it for the trading strategy is to find the right support and resistance levels. The first two levels with the number 0 and 100 should be resistance and support line at the same time, then the probability that price will bounce from these levels is much higher. As illustrate on Figure 16, price range with side trend is limited by resistance line is equal to 1.1709 EUR for one USD and support line is equal to 1.0493.

The second step for determining Fibonacci levels is to calculate the range of corridor. From resistance line on the level 1.1709 is extracted support line level 1.0493 and it is equal to 0.1216 points. This price range also represents the broadness of the channel. If levels 0 and 100 are support and resistance lines and broadness of channel is equal to 0.1216, then the 0.5 level will be places on the level of 1.1101 Euros for one dollar. Half of the channel is 0.0608 points, plus support line 1.0493 is equal to 1.1101. The same way is calculated other two levels. As a result of counting, level 38,3 is equal to 1.1244 and level 61,8 is equal to 1.0957. These three levels are illustrated below on the Figure 12.

Figure 16 EUR/USD chart, month bid from September 2012 till February 2017



Source: Rumus 1.8.4, own work, 2017.

The Fibonacci retracement levels are able not only to say what the probability of trend to continue its movement is, but also when the trader should enter the market or close the deal. First, what the trader will do is look at the first level equal to 38.2 percent. As the trend illustrated on the Figure 16 is declining, level 38.2 located on the price level 1.1244 U. S dollars for one Euro. That also means that the trader has to look on the retracement level and graph from the upside down. Before the level 38.2, price more likely will have a pullback. In the case of EUR/USD movement, pullback was on April, 2016, when the closing price was above retracement level and equal to 1.1446 USD. This retracement level was crossed by currency the next month on May, 2016. May 2016 opened on the level

1.1458 and closed under the 38.2 with the closing price equal to 1.1132, right near 50 percentage Fibonacci level.

The rage of price between 38.2 and 50.0 percentage is signaling only about possible correction movements of the price. Till the moment when price is crossing level of 50.0, the trader is only observing the situation as there is a low probability for specific trends. From the example of EUR/USD graph, it is obvious that price entered the correction trend. It took the Euro four months, till it finally hit the price level of 1.1101. This price level is already considered significant for an open position. In October 2016, the price already crossed the 50.0 level and even touched close to the retracement level. Such a situation means for traders closing the position for selling, because it is assumed that the price will not increase in the near future. The traders which are operating in the channel between 1.1709 and 1.0493 would sell Euro in the middle of October and again buy it at the end of November 2016. December 2016 is highly significant month even for the future analysis. At this period, EUR/USD crossed the last probability barrier equal to 1.0957 U. S dollars. This significant level is referring to the Golder Ratio.

Since November 2016, there were at least two other signals for selling the Euro. One was already discussed above and it indicates the “rule of two days”, when the price hit the level of 100 percent twice in a row. Another characteristic moment for the EUR/USD chart is that in the past two months from December 2016 and January 2017, price did not reach even a half of the channel. February 2017 is not closed yet, but even though price did not reach 50 percent level so far. Since the price did not extend to the point of 68.2 percent three time in a row can reinsure traders about their trading decision. It is believed that if the price did not reach the half of the tunnel twice already, it is too week for further incline movements. On this stage on analysis, all indicators giving the same results, which are pointing out future decreasing trends of EUR/USD.

Fibonacci Fan/Time Zones

Time Yones is another Fibonacci tool that is used by investors to forecast and analyze market dynamics. This tool has a supporting function and rarely used as a core. It can be a good heleper and and excellent addition to the tradign system. Fibonacci Time

Zones is an indicator that helps traders better navigate the market and to find more favorable conditions for entering market.

By its appearance they resemble vertical lines that divide the price chart in several segments. Vertical lines are built with two points and then time zones are calculated automatically with regards to Fibonacci levels. These segments are endless, but they are losing its relevance with time going. For that reason, it is more efficient to correct time zones in specific time periods.

The basic idea is that when the price is coming closer to the Fibonacci level, it indicates that market might change trend. However, it is important to notice that these trends do not always change trend on time zone boundaries, but after closing the next vertical level continues movement in the same direction. As a consequence of this situation, the Fibonacci Zone indications are requiring additional validation and filtering. Over time, the distance between vertical lines will increase together with the Fibonacci sequence, as it will take into account a longer period of time. The mentioned indicator might be used in any market condition, regardless of whether there is a trend or consolidated movement. Particular levels do not indicate that the process will rebound or make a U-turn, they only indicate that the price might change a trend. Nevertheless, probability of level confirmation is less than 100 percent.

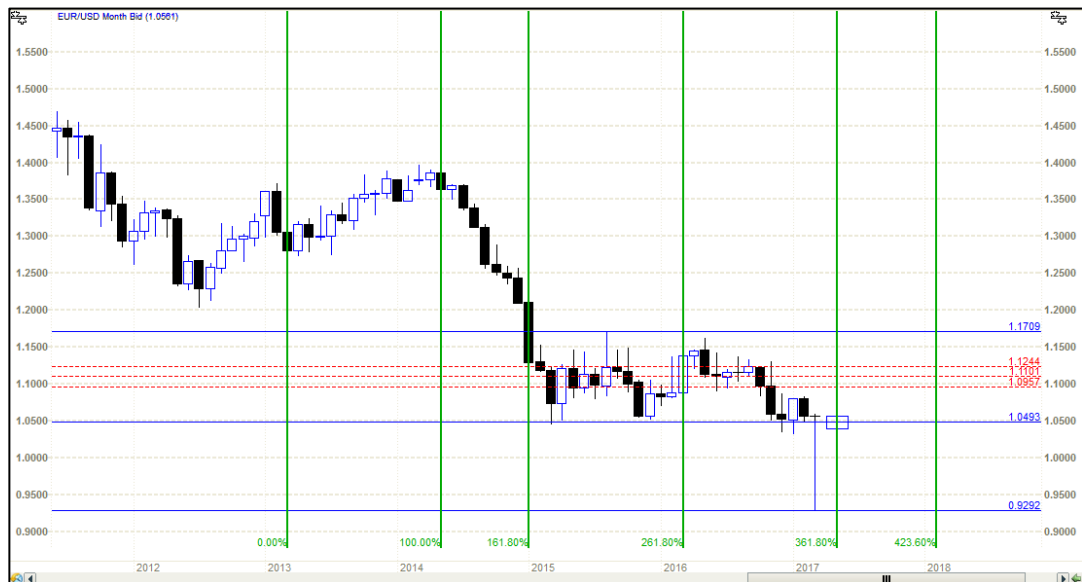
Fibonacci lines are constructed identically to other Fibonacci indicators. For building the first level, traders are using two points. These points might be represented by two highs or two lows, or they could also be built by connecting one high and one low point on the chart. Example of Fibonacci Time Zones construction is illustrated on the Figure 17. In that particular example the first point is equal to lowest level in March 2013, 1.1249 USD for 1 EUR. The second point represented by highest level in May 2014 with value of 1.3992 USD for 1 EUR. The first point candle is marked by a green line with a value of 0.00 percent and the second point by a green line with a value of 100.00 percent. Following levels are calculated automatically in trading platform Rumus 1.8.4.

Mentioned indicators have a number of conceptual advantages and disadvantages that should be considered by investors while using it. One of the advantages is that Fibonacci Time Zones are good filters of other indicators. They confirm results or correct them in time. This indicator is also a valuable alarm for possible changes in trend. In addition, time

zones are suitable even for junior traders with little experience on Forex. It is a good supplement to any trading strategy. There is one main disadvantage, that time zones cannot be used as a core of trading system, because of their low probability level.

As was mentioned above, each level is representing important signals to trader. For example, from level of 100.00 percent, the Euro changed its trend significantly and followed it till the third level of 161.80 percent. It is important to mention, that Fibonacci Time Zones also have an ability to identify the range of correction of price. Time Zones are not taking into account specific volatility of the market, but only periods of time. Traders are waiting until the price will cross all vertical levels and then building new time zones with new adjustments. Only in this way time zones can provide essential information.

Figure 17 Fibonacci Time Zones on EUR/USD chart, monthly bid



Source: Rumus 1.8.4, own work, 2017

Next step, after connecting two points on chart, is evaluation of each level. On the figure 17, every level is almost accurately representing change in trend. First range from 0 to 100 had an increasing trend during the period of 14 months. The second range was shorter than first one and took place from May 2014 till January 2015. However, the trend is more rapid, because currency often increasing slowly, but falling at least twice as fast. The last two ranges are characterized by side trend movements. The price of the Euro entered the channel in March 2015 and remained there for two years already.

As it was mentioned above, Fibonacci Time Zones are only supportive tool in overall analysis. For that reason, in the beginning was used chart analysis as channel figure and Fibonacci retracement levels. If Fibonacci Zones would be confirmed, then traders might expect significant change on May 2017. Such a statement should be supported by fundamental analysis. Since the Euro spent two years in a wide channel, it is very hard to cross the support line. Chart analyst following the rule, that the resistance line can be crossed easy, but the support line is a psychological barrier for traders. The price of Euro spent four months in the corridor and for braking this level it will require very significant fundamental factor as elections in European counties or statement from European Central Bank. If the price would cross level of 361.80 percent it might mean three things: price will reach 1.1709 for the next year, price will continue its side direction or price will break support line. As a result from Fibonacci retracement level analysis and channel analysis, prognosis confirming last option, price will cross 1.0493 level.

4.1.4 **ADX**

Average Directional Index (ADX) was developed by J. Welles Wilder in order to determine the strength of the trend and if it would continue or become weaker. ADX Indicator allows to analyze market trends and trading decisions on forex market. ADX has only one range of parameters, from 10 to 20. Usually, traders are using parameters with value from 14 to 17.

Formula of ADX is based on calculation of positive and negative directional movements, which are represented by sign +DM and - DM. ADX is calculated by following rules:

1. If High (maximum of current candle) > Hight1 (maximum of previous candle), then it is even to +DM or +DM = 0.
2. If Low (the lowest point of current candle) < Low1 (the lowest point of previous bar), then it is even to -DM, otherwise -DM = 0.
3. If +DM > -DM, then -DM = 0.
4. If -DM > +DM, then +DM = 0.
5. If +DM = -DM, then both are equal to 0.

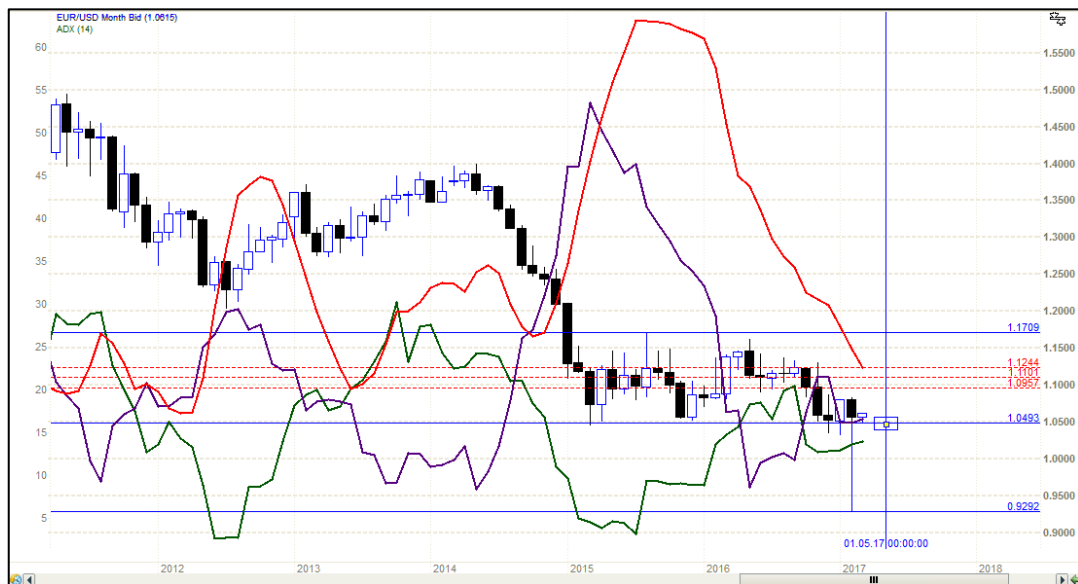
Red line on the Figure 18 is showing current movement on the market. Literally, the ADX indicator belongs to a class of oscillators that has a range from 0 to 100. Despite the fact that the ADX indicator movement is in the range from 0 to 100, it is infrequently occurring above the level of 60. In figure 14, for first time in a four years, ADX crossed level of 60 on June, 2015 and it continued to be on this level till February 2016. These values are indicating for traders that this trend has stopped and might start a sidling trend. Mentioned situation occurs as well on the chart of EUR/USD, when the Euro entered a price tunnel. Value of ADX line dropped under level of 60 in February 2016 and take declining trend. However, for trader the values already indicating the end of trend, if they are higher than 40, not 60. After February 2016 ADX indicator continued decreasing trend until current point. However, ADX crossed level of 40 in June 2016. Values below 20 indicates a weak trend and value near 40 indicates a strong trend. ADX Indicator can also be used to identify potential changes on the market. When the indicator crosses the border of 20 from the bottom, it might indicate a change of a trend and it is further development. For example, on January 2012 ADX line crossed level of 20 and then rapidly trend has changed from decreasing to increasing. On the other hand, when indicator shows a value below 40 falling from higher level, it may mean that the trend has lost power. This situation is also applicable for the Figure 18, where the Euro was falling from a value of 60 and crossed value of 40 from the top.

ADX is derivation from other two indicators, which were developed by J. Welles Wilder. One indicator is called Positive Directional Indicator (refers to +DI as well) and the second one called Negative Directional Indicator with sign -DI. At the selected time interval +DI shows the power of up movement and -DI shows the power of downward movement accordingly. Generally, ADX indicator shows the power of trend by combination of +DI and -DI data and then moving average. Since ADX is using data from +DI and -DI, it is not showing exact direction of trend, but only its volume. On the Figure 18, value +DI is represented by green color, -DI has purple color and ADX line has red color.

Traders are using this indicator for finding the right buy and sell signals, which are provided by intersections of +DI and -DI. The signal to buy currency appears, when +DI is crossing -DI from above. Accordingly, the sell signal appears, when -DI is crossing +DI

from above. For the trader, it is very important to catch the trend at an early stage of development and the ADX indicator is a good helper for achieving their goals and benefit from these transactions. To catch the trend at an early stage, it is necessary to look at the currency pairs, where ADX crosses 20 level upwards. Per ADX drop to below 40 indicates that the current trend is weakened and can start trading channel. Thus, the ADX indicator shows the presence or absence of a trend and other indicators may be used to determine entry points and entry directions. When currency is into a price range for a longer time, the points of intersection between +DI and -DI might be often false, due to mathematical specification of this indicator.

Figure 18 Implementation of ADX Indicator on EUR/USD chart, monthly bid



Source: Rumus 1.8.4, own work, 2017.

For the trader, the most important not only moment of intersection, but the movement of lines before that. From the example of EUR/USD graph above it is obvious that green line represented by +DI is below purple line, which is indication the downward in prices. This means that the market at that certain point has a decreasing trend and we could expect the downside movement in prices if Euro. However, the ADX line is also lowering, which might mean that market right now “burn out” and it is better to take a profit and wait for the next signal. Another point which is indicating about market “burn out” is that ADX line crossed value of 40 in up-down direction, so market started to lose its power.

To sum up everything, the ADX indicator shows that future developments of EUR/USD price might have a decreasing character. However, at the current period it is still moving in the specific time range. ADX indicator has its specification, which traders should consider. For instance, this indicator sometimes shows signals too late or after the movement already started. It is also noticeable from Figure 18, where intersection appeared only three months later than trend has started. This situation has roots in mathematical core of indicator. -DI is increasing, when the price goes down, and +DI opposite. Therefore, even when a declining trend has already started ADX curve will not increase until -DI will be higher than +DI. The parameter on the figure above has a value of parameter equal to 14. Eventually, ADX is showing if there are any trends at all and -DI or +DI identify, what kind of trend it would be.

4.2 Fundamental analysis

Fundamental analysis is representing the part of tools, which cannot be seen from the monitors of computers. This analysis is establishing a relationship between exchange rates and competition situations of the trading countries explaining the objectives and instruments of financial policy of the central banks, showing relations between different financial markets, reasons for their ups and downs. Technical and fundamental analysis are like a statistic of markets. However, fundamental analysis looks on the market from other point of view. It is assumed that no matter how small Forex market might be, it is a part of global economy and everything that has happened in the global economy has at least some effect on currency rates. Some of the news people cannot predict, but publication of main economic result following specific economic calendar.

The main tool of fundamental analysis is news. Usually, traders are interested in news from the country of currency origin. Fundamental analysis in this diploma thesis are focused on EUR/USD, therefore indicators will refer to Eurozone and USA economy. Overall, this analysis is very complex, because it is including many factors and requiring understanding of economy of the global level, logical-reasoning skill and experience from the trader.

Fundamental results are influenced not only by concrete macroeconomic indicators, but also traders' expectations and mood. If the published value of some important

economic indicators and central banks actions are different from the expectations of the market, then it results rapid responses in the form of a strong change of exchange rates. Economic activity involves a large number of participants and it somehow addresses a wide variety of physical and financial assets. That is a complex task to measure it all with a small set of numbers. On the other hand, it is necessary to use objective methods for predictions and operations planning in the economic environment. Ability to read and understand economic data is a science and art necessary for processing building up trader's strategy.

Key factors influencing EUR/USD refers to US and ECB monetary policy. The instruments by which central banks can increase or decrease the money supply in the country are:

- Open market operations
- Discount rate
- Reserve requirements

The Board of Governors of the Federal Reserve System is responsible for discount rate and reserve requirements. The Federal Open Market Committee (FOMC) is responsible for open market operations. Using these free tools, FED influenced the number of funds that depository institutions hold at Federal Reserve Bank and therefore c changes interest rate on short-term loans.

4.2.1 **Open market operations**

Open market operations are including sale and purchase of securities by the central banks to influence a mass of money in circulation and volume of loans. Typically, operations are carried out with short-term government securities. Buying of securities increase investment in the economic system, thereby increasing the volume of loans. Sale has the reverse effect. The Federal Open Market Committee (FOMC) is responsible for making decisions on monetary policy, including a formal decision on the interest rate, which is taken 8 times per year. At these meetings, the committee considers the economic and financial condition, determines monetary policy and assesses to the long-term goals of the price stability and economic growth. Among twelve members of the Committee, there are 7 members of the Board of Governors and Federal Reserve President of New York.

The remaining four places are occupied by other presidents of Reserve Bank. No voting presidents of the Reserve Banks attend the committee meetings, participating in discussion and contributing to the policy development.

FOMC. Latest meeting of FOMC took place on 1st of February 2017. The output of the meeting is available to everybody on the website of Federal Reserve. FOMC is currently considering the economic situation on USA as positive. There is long-term increase in economic activity, unemployment rate remains to be low compare to the previous data. Inflation in the United States has recently increased, but the target of 2 percent was not reached. The main goal of the Committee is to ensure low unemployment rates and price stability. The fsirst decision taken by FOMC is decrease of target range of federal funds rate from $\frac{1}{2}$ to $\frac{3}{4}$ percent. This measurement is aimed to make labor market stronger and get closer to the target inflation rate. The expectations of FOMC towards inflation target are positive.

ECB. During the meeting on 19th January 2017, Government Council of the European Central Bank decided to leave interest rate of refinancing operations on the level of 0.00 percent, interest rate of lending on the level of 0.25 percent and deposit interest rated on the level of -0.40 percent. ECB representatives are expecting interest rates to remain on the same level or even to fall lower.

In addition the ECB announced that new targeted long-term refinancing operations (TLTROs) will take place in 2017. By mentioning a non-standard tool, the ECB is providing long-term loans to banks to encourage their economic activity and to push inflation to the level of 2 percent. The difference between regular lending procedure and TLTROs is that TLTROs are given for four years, which is sponsoring the bank sector with reliable funding during the market instability. Following non-standard operations contributing to the growth of economic activity and to the price stability. By taking loan from the ECB, banks will be able to borrow more to their consumers on the lower interest rate than usually.

Expanded Asset Purchase Programme (APP) is another tool, which the ECB is planning to use in 2017 and refers to purchase of public securities during the long period of low inflation. Purchasing of its own securities brings more money to the economy,

depreciate local currency and is followed by higher inflation. The whole program is a combination of following operations (ECB, 2017):

- Third covered bond purchase programme (CBPP3)
- Asset-backed securities purchase programme (ABSPP)
- Public sector purchase programme (PSPP)
- Corporate sector purchase programme (CSPP)

The ECB has planned to buy 80 billion EUR until the end of the March 2017 and it will continue until the end of the year 2017. From April 2017, the amount of purchase would decrease to 60 billion Euros per month. Mentioned economic instrument is aimed to stimulate inflation to the target point of 2 percent.

To conclude, FOMC has made an important decision in February to increase federal funds rate from 0.5 to 0.75, which is significantly low compare to 2008. However, this step is positive indicator for investors. The higher interest rate, the more investors would like to buy currency. This process might lead to higher demand on local currency and appreciation of currency. As the Euro and U.S dollar are considered as competitive currencies in the pair EUR/USD, the appreciation of U.S dollar automatically means depreciation of the Euro. On the other side, European Central Bank make to highly significant measurements such as TLTROs and APP. First one, the same as FOMC measurement, aimed to stimulate economy and increase level of inflation. However, APP is contributing to the depreciation of the Euro. Furthermore, the ECB announced that interest rates will remain on the same low level. Analysis of open market operations indicates to trader future depreciation of Euro and following sell signal.

4.2.2 **GDP**

From the data, available from economic overview for winter 2017 (Appendix 5), it is noticeable that ECB is expecting decrease in real GDP from 1.7 in 2016 to 1.6 in 2017. ECB characterized global economic situation as “*surrounded by uncertainty*”. (ECB, 2017) The European economy has met various domestic and international challenges during 2016, such as slow economic growth since 2008 crisis, refugee situation, recent terrorist attracts, Brexit. However, the European economy has proven its stability and

resilience. This stability was a combination of low oil prices, structural reforms and monetary regulations. This economy is still going through recovery.

On the 14th February, Eurostat released the overview of fourth quarter of 2016. The expectations of investors and predictions of ECB estimated growth by 0.5 percent of real GDP. However, the real data showed increase by 0.4 percent. For comparison, the GDP of the United States has grown by 0.5 percent of real GDP. Stated economic overview indicates sell sign and motivates investors to buy more U.S dollars, as US economy growing faster. On the other hand, FOMC is expecting growth on real GDP in following years by 2 percent. The report of ECB from January has also mentioned positive influences of U.S. stimulations on business environments. However, there are some concerns about international trade regarding latest protectionist mood in U.S.

4.2.3 Unemployment

News about unemployment in all countries is considered as an important indicator of economic activity and closely followed by investors. The reason of this is that there are consequences, which high level of unemployment brings. For instance, it shows a decrease in individual incomes and forcing government to increase public spending. High rates are also means for the government low income tax revenues and an unproductive economy. Seasonally adjusted unemployment rates are suitable for international comparing of different economies. The driving tools of employment are technological progress and globalization of the labor market. It may cause the creation of new position, but also decrease in open positions due to automatization of the processes.

Next overview of unemployment rate will be published in the middle of March. Nevertheless, per Eurostat, the number of unemployed people in January 2017 decreased by 56 000 in the Eurozone from December 2016. Unemployment rates is calculated with seasonal adjustments and it is equal to 9.6 percent within the Eurozone. The lowest rate within the Eurozone is noted in Germany (3.8 percent) and the highest in Greece (23 percent in November, 2016). Compare to Eurozone, the unemployment rate in the United States was 4.8 percent in January 2017, which is higher than in December 2016 by 0.1 percent. The increase in the United States unemployment in January 2017 is an insignificant change compared to 9.6 percent in Eurozone.

Then unemployment rate in Euro areas has the same trend as in European Union. From 2000 to 2004 it had decreasing character. However, in 2004 the number of unemployed people raised to 21.2 million people compare to 20.5 million people in 2000. The period from 2004 till 2008 was characterized by steady decline. However, after 2008 it starts to increase till the end of 2015 and reached the record value of 11 percent in 2013. In comparison to Eurozone, USA unemployment rate in 2000 was on the level of 4 percent, which is significantly lower than in European Union and in Euro area at the same time. The economic crisis in 2008 increased percentages in US to the level of European Union, which is tearing Europe apart.

4.2.4 **Political situation Political and social overview**

Fundamental analysis requires complex knowledge both economic and social development of comparing countries. Fundamental traders are using for analysis economic calendar along with news, which might affect economic situations in the country. Two currency zones represented by everything he Forex quote could be compared as a separate or interconnected entities. Unfortunately, fundamental traders could not predict exactly, which important news would impact currency movement and how exactly it will happen, because analysis has too much input from outside. Additional limitation of fundamental analysis is that, it often depends on expectations of traders, no matter what the real news is.

The last development of Eurozone influenced by significant number of challenges. First, it has been influenced by “Brexit”. The economic situation and economic relationship has not changed since the results of vote were published. However, it brings a level of uncertainty for the traders. They do not know what output to expect form started negotiation process and what influence it might bring, but expectations are not positive for the Eurozone. Some of the economists say that impact would be damaging for Eurozone, but it does not bring any significant positive news for the whole Europe. On the other hand, this gives new opportunities for United States to establish closer economic connection with U.K, as both are important states in the global economy.

Summer 2015 and upcoming summer of 2017 are related to “refugee crisis” in Europe. Germany welcomed around 1 million refugees in 2015 with main advocate Angela Merkel, which stimulated a significant amount of complaints from the side of local

inhabitants. Regardless, if people in the Eurozone are willing to welcome refugees or not, this situation is leading again to economic uncertainty and feeling of insecurity. Despite the feeling of humanity, business aspects are still seen as the priority. The first fear that comes to mind is that number of coming people will push wages down. However, the studies of Oxford University and Jumana Saleheen of the Bank of England shows that only unskilled positions will be influenced. In addition, 2 percent change requires at least 10 percent raise in number of immigrants. It shows that coming immigrants are motivating local inhabitants to change jobs towards more prestige ones. The fiscal impact from the refugees is low. From studies by OECD it is known, that the income from taxes has increased only by 0.35 percent for the two years. However, in contrast to past immigrant in Germany new arrivals mainly consists of young and workable people. The IMF estimates that refugees will contribute to the national debt in European countries by 0.19 percent and double that in Germany. Certainly, unemployment will increase. This all depends on how fast the application process will be and how soon immigrants will be able to get a job. Even the president of ECB called “refugee crisis” as one of the greatest challenges Europe is facing at the current moment.

One more challenge ahead of Eurozone is elections in a large Member States countries, which accounts for 40 percent of EU economy. The votes will be influenced by recent event in the Europe, such as populist mood, banking crisis, refugee crisis and Brexit. Probably, one of the most significant even is election in Germany, where Alternative for Germany is building up strong opposition to Angela Merkel. Elections in Spain also are showing strong support from people for Basque nationalists, as this country remains in the crisis for the recent years. Per the poll before elections, Italian voters are planning to give more votes to the Democratic party. From last year, Austria had chance to show their opinion regarding the refugee crisis, the country was separated into two parts. In 2017, presidential elections are giving second chance to populist and far-right party Freedom. On 2nd October, Hungarians will vote in order to influence EU impact on the refugee decisions. Some of the analytics assuming, that it might lead to the exit votes. Elections in the Netherlands, France, Germany and Austria, major European countries, to significant shift in political identity of Europe. Carsten Brzeksi, the Chief German Economist believed that if one of the right-wing party would win elections, it will bring the Eurozone down.

However, the currency market is stable and shows strong ability to cope with Brexit and other challenges it is bringing.

The victory of Donald Trump in recent elections depreciated the dollar for many reasons. It had a negative effect on the Euro exchange rates, because it has a dissonance with European expectations. For investors in dollar, victory of Donald is sure signal for buying. Compare to European Central Bank, Mr. Trump promised to his votes increase of interest rates, which is a significant factor which is stressing the global economy in past years. Protectionist measurements are not aligned with European values, but it creates more jobs and bring business back to the country. It is not known for sure, if all promises of Donald Trump will be implemented during his presidency. However, for investors these measurements are more favorable compared with the Euro. In addition, a decrease in corporate taxes might boost an economy. The tax strategy of the new president has two sides. It will decrease government income while increasing the deficit.

Recent developments between the Euro and U.S dollar is flat and bears have trouble to put the Euro below the support line. Long-term position trends remain decreasing and prices remain too close to the support line.

5. Conclusion

Technical and fundamental analysis are two approaches, which are considered as two opposing ways of analysing the foreign exchange market. Discussion about which approach is more suitable for analysing foreign exchange markets have been ongoing for many years. In this diploma thesis predictions of the currency pair EUR/USD are based on both approaches. The indicator ADX is showing the power of trends and also the beginning of trends. Thanks to fundamental techniques, traders can decide if the EUR will depreciate or appreciate against the USD. In addition, the technical indicator ADX often provides late signals due to the mathematical specification. For instance, if the ADX indicator shows that the price of the Euro has a decreasing trend, but is not strong enough to crash the support line of the price channel, the trader might evaluate political and economic situations in the Eurozone and USA in order to find events which might have negative impact on Euro (news, economic reports, speeches). As it is noticeable from practical analysis, fundamental analyses are able to eliminate limitation of technical indicators. Through the application of both approaches, first hypothesis is accepted.

Traders have opportunity to close deals for five or ten minutes on price movements, therefore trends which are taking place longer than one year are considered as long-term. EUR/USD price channel is built by the supporting line equal to 1.0493 EUR per USD and resistance line equal to 1.1709 EUR per USD. Prices are not able to cross these borders for over two years starting from 2015 after the oil prices crashed. Therefore EUR/USD exchange rates are showing long-term stability and second hypothesis can be accepted.

The historical overview of exchange rate movements shows that every significant change is supported by specific economic or political events. For example, in 2014 the price of the Euro has fallen from 1.4000 to 1.0500 EUR per USD due to oil prices decreasing. The implementation of fundamental analysis is a complex procedure, therefore only about 20 percent of traders prefer this approach. It has limitations especially in the part of interpretation. For instance, in January 2017 ECB announced that interest rates will remain the same or even decrease further. At the same time, the Federal Reserve System in the United States announced that interest rates will increase from 0.5 percent to 0.75. Usually, such news will indicate that the U.S dollar might appreciate against the Euro, but the impact had an opposite effect. The reason for the mentioned movements revolves

around the expectation of traders. When traders are expecting some results or outputs from summits, this was already included in the market.

Technical analysis on the foreign exchange market are suitable for short-term decisions making. One of the reasons is that output from indicator loses its value after a certain period of time. For example, Fibonacci Time Zones are not significant after it is crossing the golden ration. This means that every time when the price overcomes some level, traders need to build new time zone levels.

Compared to technical indicators, fundamental analyses are more suitable for long-term decisions, because price formation based on news or expectations needs more time. One fundamental indicator may have been the addition of 20 connections to market price movements. The strategies of traders are fully individual. Some of the traders can use only fundamental or technical analyses. Nevertheless, understanding of the overall situation of the market gives the technician more insights for confirming specific indicating signals.

The main goal of this diploma thesis is to provide predictions of EUR/USD rate movements based on results from two types of analysis. The first step in analysis is identification of the main trend of the market. By using graphic figures such as price tunnels, the side movement of EUR/USD from the past two years was identified in the range from 1.0493 till 1.1709. It is believed that the range of the tunnel is the level of the next support line. In that case, the next price of the Euro is 0.9292 for one U.S dollar. The implementation of Fibonacci retracement levels separated tunnels in three main borders. The golden ration of Fibonacci retracement is equal to 61.8 percent which is 1.0957 price level. As the Euro already crossed the price level of 1.0957 in the past, it indicated to traders that the price had a decreasing trend. In addition, prices already crossed the support line two times in a row, which is referring to the *two days rule*.

The power of decreasing trends is measured by Average Directional Index (ADX). The ADX indicator, similar to the Fibonacci retracement, showed a decreasing trend for the Euro. However, the ADX line has shifted from values of 40 to 20. This downside of values represents low power for the current trend.

For identification of specific moments, when price of the Euro might take a declining movement, Fibonacci Time Zones analyses were used. According to this indicator, the price of the Euro has two crucial points in May 2017 and in the beginning of 2018. The

change of side trends will require important economic news or political decisions. These possible decisions and news are evaluated by the fundamental approach.

Declining trends of the EUR against USD is supported by recent political situations in the Eurozone and economic decisions of European Central Bank. In a report from 2017, the ECB described the global economic and political situation as highly uncertain. It is also stated that the European economy had to face challenges during previous years. For example, refugee crises, terrorist's attacks and Brexit. In addition, the ECB has decided to implement a quantitative-easing strategy in order to increase inflation rates. By March 2017, the ECB has planned to buy securities for 80 billion EUR and continue to make purchases in the future at 10 billion EUR per month. This decision might depreciate the Euro. However, the stability of the European economy is supported by structural monetary regulations and low oil prices.

From a long-term perspective, fundamental analysis shows future appreciation of the U.S dollar. During the meeting of the Government Council of ECB on the 19th of January 2017, it had been announced that interest rate of refinancing operations stayed on the level of 0.00 percent, interest rate of lending on the level of 0.25 percent and deposit interest rate on the level of -0.40 percent. The ECB representatives are now expecting interest rates to remain on the same level or to even fall lower. Compared to the Euro, FOMC increased the federal funds rate in February 2017 from 0.5 percent to 0.75 percent and they are planning to increase it in the following months. Another important fundamental indicator is gross domestic product. The expectations of investors and predictions of the ECB estimated growth by 0.5 percent of real GDP in the last quarter of 2016. Nevertheless, data has showed it increased by 0.4 percent. For comparison, GDP of United States has grown by 0.5 percent of real GDP.

Based on a combination of results from technical and fundamental analysis, the Euro is supposed to fall to the new resistance level of 0.9292 Euro per U.S dollar. For investors, it is clear signal for selling Euro. Following estimations requires closer analysis of future fundamental indicators such as the results of elections in the Netherland, Germany and France.

6. References

Bibliography

ACHELIS, Steven B. *Technical Analysis From A To Z*. United States: Vision Books, 2005. ISBN 8170943124.

ALDER, G. and CAMILO E. 2011, "*Foreign exchange intervention: a shield against appreciation winds?*" IMF Working Papers: 1-29.

ALLAN H. MELTZER. *A History of the Federal Reserve 2/ 1, 1951-1969*. Chicago: University of Chicago Press, 2009. ISBN 0226519856

BERGSTEN C. Fred and RUSSELL A. Green. *International Monetary Cooperation: Lesson from the Plaza Accord after Thirty Years*. Washington: Peterson Institute for International Economics, c2016. ISBN 0881327123.

BORDO, Michael D. a Barry J. EICHENGREEN. *A Retrospective on the Bretton Woods system: lessons for international monetary reform*. Chicago: University of Chicago Press, c1993. National Bureau of Economic Research project report.

BORODEN, Carolyn. *Fibonacci Trading – Fibonacci Price Retracement*. McGraw Hill Professional, 3rd edition. c2008. ISBN 9780071716192.

BROOKS, Kathleen a Brian. DOLAN. *Currency trading for dummies*. 3rd edition. John Wiley & Sons, c2015. ISBN 1118989813.

BUTCHER, Kel. *Forex Made Simple a Beginner's Guide to Foreign Exchange Success*. Hoboken: John Wiley & Sons, 2011. ISBN 0730375269.

CHENG, Grace. *7 winning strategies for trading forex real and actionable techniques for profiting from the currency markets*. Petersfield, Hampshire, Great Britain: HarrimNan House, 2007. ISBN 0857190245.

DEPPLER, Michael. *How Has the Asian Crisis Affected Other Regions?* Finance & Development. Washington, D.C., 1998, (3), 32. ISSN 0015-1947.

GILBERT, Bradley. *Insider: investment bank chief foreign exchange trader with more than 20 years' experience as a market maker*. 2012. ISBN 1452506566.

HAMORI, Shigeyuki a Naoko. HAMORI. *Introduction of the Euro and the monetary policy of the European Central Bank*. Hackensack, NJ: World Scientific Pub. Co., c2010. ISBN 9812838430.

JOHN JAGERSON, S. Wade Hansen. *All about Forex trading*. Online-Ausg. New York: McGraw-Hill, 2011. ISBN 9780071768238.

KLEIN, Michael W. a Paul J. J. WELFENS. *Multinationals in the new Europe and global trade*. New York: Springer-Verlag, c1992. ISBN 0387546340.

LIEN, Kathy. *Day trading and swing trading the currency market: technical and fundamental strategies to profit from market moves*. 2nd ed. Hoboken, N.J.: John Wiley & Sons, Inc., c2009. ISBN 9780470377369.

LOVERT A. William and ECKES E. Alfred, Jr. *U. S. Trade Policy: History, Theory, and the WTO: History, Theory, and the WTO*. Routledge, 2nd ed., c2015. ISBN 1317453166.

MARCOVICI, Michael. *The Forex Scam What you must know about Forex online*. 1st ed. Norderstedt: Books on Demand, 2013. ISBN 3732287270.

MURPHY, John J. *Technical Analysis of the financial markets: A Comprehensive Guide To Trading Methods And Applications*. 1st ed. New York: NYIF, 1999. 542 p. ISBN 0-7352-0066-1.

NAVEEN B. K., SANJAY M. *The Use of Technical and Fundamental Analysis in the Stock Market in Emerging and Developed Economies*. Emerald Group Publishing, c2015. ISBN 9781785604041.

O'KEEFE, Ryan. *Making money in forex trade like a pro without giving up your day job*. Hoboken, N.J: Wiley, 2013. ISBN 0470609044.

ROCKEFELLER, Barbara. *The global trader: strategies for profiting in foreign exchange, futures, and stocks*. New York: J. Wiley, c2002. ISBN 9780471435853

SCHWAGER, Jack D. *Getting started in technical analysis*. New York: John Wiley, c1999. ISBN 0471295426.

SILVANI, Agustin. *Beat the Forex dealer: an insider's look into trading today's foreign exchange market*. Hoboken, NJ: Wiley, c2008. Wiley trading series. ISBN 0470722088.

WEATHERFORD, Jack. *The history of money from sandstone to cyberspace*. New York: Three Rivers Press, 1997. ISBN 0307556743.

Online sources

BIS Quarterly Review from December 2016. International banking and financial market developments. Bank for International Settlements. ©2015 [ref. 2017-01-13]. SSN 1683-013X. Available from: http://www.bis.org/publ/qtrpdf/r_qt1612.pdf

ECB Convergence Report, June 2016. European Central Bank [online]. ©2016 [ref. 2017-01-5]. Available from: <https://www.ecb.europa.eu/pub/pdf/conrep/cr201606.en.pdf?a91977931874a7c6c63d80305b651394>

How Euro become our currency. European Central Bank [online]. ©2007 [ref. 2016-12-10]. ISBN: 92-9181-985-9. Available from: https://www.ecb.europa.eu/pub/pdf/other/Euro_became_our_money_en.pdf

Overview of the Federal Reserve System. Federal Reserve System [online]. ©2015 [ref. 2016-09-16]. Available from: https://www.federalreserve.gov/aboutthefed/files/pf_1.pdf

Quarterly Report on Federal Reserve Balance Sheet Developments from August 2016. Federal Reserve System [online]. ©2016 [ref. 2016-09-16]. Available from:

Why the Swiss unpegged the Franc. The Economist [online]. ©2015 [ref. 2017-01-13]. Available from: <http://www.economist.com/blogs/economist-explains/2015/01/economist-explains-13>

Monetary Policy Report from February 2016. Board of Governors of the Federal Reserve System. [online]. ©2016 [ref. 2016-09-16]. Available from: https://www.federalreserve.gov/monetarypolicy/files/20160210_mprfullreport.pdf

Monetary Policy Report from February 2016. Board of Governors of the Federal Reserve System. [online]. ©2016 [ref. 2016-09-16]. Available from: https://www.federalreserve.gov/monetarypolicy/files/20170214_mprfullreport.pdf

Unemployment statistics. Eurostat. [online]. ©2017 [ref. 2017-03-1]. Available from: http://ec.europa.eu/Eurostat/statistics-explained/index.php/Unemployment_statistics

7. Appendix

Appendix 1 Convergence criteria

STAGE ONE starting 1 Jul 1990	Complete freedom for capital transactions;
	Increased co-operation between central banks;
	Free use of the ECU (European Currency Unit, forerunner of the €);
	Improvement of economic convergence;
STAGE TWO starting 1 Jan 1994	Establishment of the European Monetary Institute (EMI);
	Ban on the granting of central bank credit;
	Increased co-ordination of monetary policies;
	Strengthening of economic convergence;
	Process leading to the independence of the national central banks, to be completed at the latest by the date of establishment of the European System of Central Banks;
	Preparatory work for Stage Three;
STAGE THREE starting 1 Jan 1999	Irrevocable fixing of conversion rates;
	Introduction of the euro;
	Conduct of the single monetary policy by the European System of Central Banks;
	Entry into effect of the intra-EU exchange rate mechanism (ERM II);
	Entry into force of the Stability and Growth Pact;

Source : European Central Bank, 2016

Appendix 2 Foreign exchange turnover by currency pair

OTC foreign exchange turnover by currency pair

Net-net basis,¹ daily averages in April, in billions of US dollars and percentages

Table 3

Currency pair	2001		2004		2007		2010		2013		2016	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
USD / EUR	372	30,0	541	28,0	892	26,8	1 099	27,7	1 292	24,1	1 172	23,1
USD / JPY	250	20,2	328	17,0	438	13,2	567	14,3	980	18,3	901	17,8
USD / GBP	129	10,4	259	13,4	384	11,6	360	9,1	473	8,8	470	9,3
USD / AUD	51	4,1	107	5,5	185	5,6	248	6,3	364	6,8	262	5,2
USD / CAD	54	4,3	77	4,0	126	3,8	182	4,6	200	3,7	218	4,3
USD / CNY	...	...	...	...	...	...	31	0,8	113	2,1	192	3,8
USD / CHF	59	4,8	83	4,3	151	4,5	166	4,2	184	3,4	180	3,6
USD / MXN	...	...	...	...	...	...	...	...	128	2,4	90	1,8
USD / SGD	...	...	...	...	...	...	...	...	65	1,2	81	1,6
USD / KRW	...	...	...	...	...	...	58	1,5	60	1,1	78	1,5
USD / NZD	...	...	...	...	...	...	...	...	82	1,5	78	1,5
USD / HKD	...	...	...	...	...	...	85	2,1	69	1,3	77	1,5
USD / SEK	...	...	...	...	57	1,7	45	1,1	55	1,0	66	1,3
USD / TRY	...	...	...	...	...	...	...	...	63	1,2	64	1,3
USD / INR	...	...	...	...	...	...	36	0,9	50	0,9	56	1,1
USD / RUB	...	...	...	...	...	...	...	...	79	1,5	53	1,1
USD / NOK	...	...	...	...	...	...	...	...	49	0,9	48	0,9
USD / BRL	...	...	...	...	...	...	25	0,6	48	0,9	45	0,9
USD / ZAR	...	...	...	...	...	...	24	0,6	51	1,0	40	0,8
USD / TWD	...	...	...	...	...	...	...	...	22	0,4	31	0,6
USD / PLN	...	...	...	...	...	...	...	...	22	0,4	19	0,4
USD / OTH	199	16,0	307	15,9	612	18,4	446	11,2	214	4,0	215	4,2
EUR / GBP	27	2,1	47	2,4	69	2,1	109	2,7	102	1,9	100	2,0
EUR / JPY	36	2,9	61	3,2	86	2,6	111	2,8	148	2,8	79	1,6
EUR / CHF	13	1,1	30	1,6	62	1,9	71	1,8	71	1,3	44	0,9
EUR / SEK	...	...	...	...	24	0,7	35	0,9	28	0,5	36	0,7
EUR / NOK	...	...	...	...	...	...	...	...	20	0,4	28	0,6
EUR / AUD	1	0,1	4	0,2	9	0,3	12	0,3	21	0,4	16	0,3
EUR / CAD	1	0,1	2	0,1	7	0,2	14	0,3	15	0,3	14	0,3
EUR / PLN	...	...	...	...	...	...	...	...	14	0,3	13	0,3
EUR / DKK	...	...	...	...	...	...	...	...	13	0,2	13	0,2
EUR / HUF	...	...	...	...	...	...	...	...	10	0,2	5	0,1
EUR / TRY	...	...	...	...	...	...	...	...	6	0,1	4	0,1
EUR / CNY	...	...	...	...	...	...	...	...	1	0,0	2	0,0
EUR / OTH	20	1,6	38	1,9	83	2,5	102	2,6	51	0,9	65	1,3
JPY / AUD	...	...	...	...	...	...	24	0,6	46	0,9	31	0,6
JPY / CAD	...	...	...	...	...	...	...	...	6	0,1	7	0,1
JPY / NZD	...	...	...	...	...	...	4	0,1	5	0,1	5	0,1
JPY / TRY	...	...	...	...	...	...	...	...	1	0,0	3	0,1
JPY / ZAR	...	...	...	...	...	...	...	...	4	0,1	3	0,1
JPY / BRL	...	...	...	...	...	...	...	...	3	0,1	1	0,0
JPY / OTH	15	1,2	28	1,4	66	2,0	50	1,3	88	1,7	45	0,9
Other currency pairs	13	1,1	22	1,1	74	2,2	71	1,8	44	0,8	116	2,3
All currency pairs	1 239	100,0	1 934	100,0	3 324	100,0	3 973	100,0	5 357	100,0	5 067	100,0

¹ Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis).

Source: Bank for International Settlements, 2016

Appendix 3 Foreign exchange turnover by location

Geographical distribution of OTC foreign exchange turnover¹

Net-gross basis,² daily averages in April, in billions of US dollars and percentages

Table 6

Country	2001		2004		2007		2010		2013		2016	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Argentina	...	...	1	0,0	1	0,0	2	0,0	1	0,0	1	0,0
Australia	54	3,2	107	4,1	176	4,1	192	3,8	182	2,7	121	1,9
Austria	8	0,5	15	0,6	19	0,4	20	0,4	15	0,2	19	0,3
Bahrain	3	0,2	3	0,1	3	0,1	5	0,1	9	0,1	6	0,1
Belgium	10	0,6	21	0,8	50	1,2	33	0,6	22	0,3	23	0,4
Brazil	6	0,3	4	0,1	6	0,1	14	0,3	17	0,3	20	0,3
Bulgaria	...	...	...	...	1	0,0	1	0,0	2	0,0	2	0,0
Canada	44	2,6	59	2,3	64	1,5	62	1,2	65	1,0	86	1,3
Chile	2	0,1	2	0,1	4	0,1	6	0,1	12	0,2	7	0,1
China	...	...	1	0,0	9	0,2	20	0,4	44	0,7	73	1,1
Chinese Taipei	5	0,3	9	0,4	16	0,4	18	0,4	26	0,4	27	0,4
Colombia	0	0,0	1	0,0	2	0,0	3	0,1	3	0,0	4	0,1
Czech Republic	2	0,1	2	0,1	5	0,1	5	0,1	5	0,1	4	0,1
Denmark	24	1,4	42	1,6	88	2,1	120	2,4	117	1,8	101	1,5
Estonia	...	...	0	0,0	1	0,0	1	0,0	0	0,0	...	...
Finland	2	0,1	2	0,1	8	0,2	31	0,6	15	0,2	14	0,2
France	50	2,9	67	2,6	127	3,0	152	3,0	190	2,8	181	2,8
Germany	91	5,4	120	4,6	101	2,4	109	2,2	111	1,7	116	1,8
Greece	5	0,3	4	0,2	5	0,1	5	0,1	3	0,0	1	0,0
Hong Kong SAR	68	4,0	106	4,1	181	4,2	238	4,7	275	4,1	437	6,7
Hungary	1	0,0	3	0,1	7	0,2	4	0,1	4	0,1	3	0,1
India	3	0,2	7	0,3	38	0,9	27	0,5	31	0,5	34	0,5
Indonesia	4	0,2	2	0,1	3	0,1	3	0,1	5	0,1	5	0,1
Ireland	9	0,5	7	0,3	11	0,3	15	0,3	11	0,2	2	0,0
Israel	1	0,1	5	0,2	8	0,2	10	0,2	8	0,1	8	0,1
Italy	18	1,0	23	0,9	38	0,9	29	0,6	24	0,4	18	0,3
Japan	153	9,0	207	8,0	250	5,8	312	6,2	374	5,6	399	6,1
Korea	10	0,6	21	0,8	35	0,8	44	0,9	48	0,7	48	0,7
Latvia	...	...	2	0,1	3	0,1	2	0,0	2	0,0	1	0,0
Lithuania	...	...	1	0,0	1	0,0	1	0,0	1	0,0	0	0,0
Luxembourg	13	0,8	15	0,6	44	1,0	33	0,7	51	0,8	37	0,6
Malaysia	1	0,1	2	0,1	3	0,1	7	0,1	11	0,2	8	0,1
Mexico	9	0,5	15	0,6	15	0,4	17	0,3	32	0,5	20	0,3
Netherlands	31	1,8	52	2,0	25	0,6	18	0,4	112	1,7	85	1,3
New Zealand	4	0,2	7	0,3	13	0,3	9	0,2	12	0,2	10	0,2
Norway	13	0,8	14	0,6	32	0,7	22	0,4	21	0,3	40	0,6
Peru	0	0,0	0	0,0	1	0,0	1	0,0	2	0,0	1	0,0
Philippines	1	0,1	1	0,0	2	0,1	5	0,1	4	0,1	3	0,0
Poland	5	0,3	7	0,3	9	0,2	8	0,2	8	0,1	9	0,1
Portugal	2	0,1	2	0,1	4	0,1	4	0,1	4	0,1	2	0,0
Romania	...	...	...	...	3	0,1	3	0,1	3	0,1	3	0,0
Russia	10	0,6	30	1,1	50	1,2	42	0,8	61	0,9	45	0,7
Saudi Arabia	2	0,1	2	0,1	4	0,1	8	0,1	7	0,1	8	0,1
Singapore	104	6,1	134	5,1	242	5,6	266	5,3	383	5,7	517	7,9
Slovakia	1	0,0	2	0,1	3	0,1	0	0,0	1	0,0	2	0,0
Slovenia	0	0,0	0	0,0	0	0,0	...	...	...	...	...	...
South Africa	10	0,6	10	0,4	14	0,3	14	0,3	21	0,3	21	0,3
Spain	8	0,5	14	0,5	17	0,4	29	0,6	43	0,6	33	0,5
Sweden	25	1,5	32	1,2	44	1,0	45	0,9	44	0,7	42	0,6
Switzerland	76	4,5	85	3,3	254	5,9	249	4,9	216	3,2	156	2,4
Thailand	2	0,1	3	0,1	6	0,1	7	0,1	13	0,2	11	0,2
Turkey	1	0,1	3	0,1	4	0,1	17	0,3	27	0,4	22	0,3
United Kingdom	542	31,8	835	32,0	1 483	34,6	1 854	36,7	2 726	40,8	2 406	36,9
United States	273	16,0	499	19,1	745	17,4	904	17,9	1 263	18,9	1 272	19,5
Total	1 705	100,0	2 608	100,0	4 281	100,0	5 045	100,0	6 686	100,0	6 514	100,0

¹ Data may differ slightly from national survey data owing to differences in aggregation procedures and rounding. The data for the Netherlands are not fully comparable over time due to reporting improvements in 2013. ² Adjusted for local inter-dealer double-counting (ie "net-gross" basis).

Source: Bank for International Settlements, 2016

Appendix 4 Foreign exchange turnover in % by currency

Currency distribution of OTC foreign exchange turnover

Net-net basis,¹ percentage shares of average daily turnover in April²

Table 2

Currency	2001		2004		2007		2010		2013		2016	
	Share	Rank	Share	Rank	Share	Rank	Share	Rank	Share	Rank	Share	Rank
USD	89,9	1	88,0	1	85,6	1	84,9	1	87,0	1	87,6	1
EUR	37,9	2	37,4	2	37,0	2	39,0	2	33,4	2	31,4	2
JPY	23,5	3	20,8	3	17,2	3	19,0	3	23,0	3	21,6	3
GBP	13,0	4	16,5	4	14,9	4	12,9	4	11,8	4	12,8	4
AUD	4,3	7	6,0	6	6,6	6	7,6	5	8,6	5	6,9	5
CAD	4,5	6	4,2	7	4,3	7	5,3	7	4,6	7	5,1	6
CHF	6,0	5	6,0	5	6,8	5	6,3	6	5,2	6	4,8	7
CNY ³	0,0	35	0,1	29	0,5	20	0,9	17	2,2	9	4,0	8
SEK	2,5	8	2,2	8	2,7	9	2,2	9	1,8	11	2,2	9
NZD ³	0,6	16	1,1	13	1,9	11	1,6	10	2,0	10	2,1	10
MXN ³	0,8	14	1,1	12	1,3	12	1,3	14	2,5	8	1,9	11
SGD ³	1,1	12	0,9	14	1,2	13	1,4	12	1,4	15	1,8	12
HKD ³	2,2	9	1,8	9	2,7	8	2,4	8	1,4	13	1,7	13
NOK ³	1,5	10	1,4	10	2,1	10	1,3	13	1,4	14	1,7	14
KRW ³	0,8	15	1,1	11	1,2	14	1,5	11	1,2	17	1,7	15
TRY ³	0,0	30	0,1	28	0,2	26	0,7	19	1,3	16	1,4	16
RUB ³	0,3	19	0,6	17	0,7	18	0,9	16	1,6	12	1,1	17
INR ³	0,2	21	0,3	20	0,7	19	0,9	15	1,0	20	1,1	18
BRL ³	0,5	17	0,3	21	0,4	21	0,7	21	1,1	19	1,0	19
ZAR ³	0,9	13	0,7	16	0,9	15	0,7	20	1,1	18	1,0	20
DKK ³	1,2	11	0,9	15	0,8	16	0,6	22	0,8	21	0,8	21
PLN ³	0,5	18	0,4	19	0,8	17	0,8	18	0,7	22	0,7	22
TWD ³	0,3	20	0,4	18	0,4	22	0,5	23	0,5	23	0,6	23
THB ⁴	0,2	24	0,2	22	0,2	25	0,2	26	0,3	27	0,4	24
MYR ⁴	0,1	26	0,1	30	0,1	28	0,3	25	0,4	25	0,4	25
HUF ³	0,0	33	0,2	23	0,3	23	0,4	24	0,4	24	0,3	26
SAR ⁴	0,1	27	0,0	32	0,1	32	0,1	34	0,1	34	0,3	27
CZK ⁴	0,2	22	0,2	24	0,2	24	0,2	27	0,4	26	0,3	28
ILS ⁴	0,1	25	0,1	26	0,2	27	0,2	31	0,2	29	0,3	29
CLP ⁴	0,2	23	0,1	25	0,1	30	0,2	29	0,3	28	0,2	30
IDR ⁴	0,0	28	0,1	27	0,1	29	0,2	30	0,2	30	0,2	31
COP ⁴	0,0	31	0,0	33	0,1	33	0,1	32	0,1	33	0,2	32
PHP ⁴	0,0	29	0,0	31	0,1	31	0,2	28	0,1	31	0,1	33
RON ⁴	...	37	...	40	0,0	34	0,1	33	0,1	32	0,1	34
PEN ⁴	0,0	32	0,0	35	0,0	36	0,0	36	0,1	35	0,1	35
OTH	6,6		6,6		7,7		4,7		1,6		2,1	
Total	200,0		200,0		200,0		200,0		200,0		200,0	

¹ Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis). ² Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%. ³ Turnover for years prior to 2013 may be underestimated owing to incomplete reporting of offshore trading in previous surveys. Methodological changes in the 2013 survey ensured more complete coverage of activity in emerging market and other currencies. ⁴ Turnover may be underestimated owing to incomplete reporting of offshore trading.

Sources: Bank for International Settlements, 2016

Appendix 5 Forecast of economic performance for winter 2017

Overview - the winter 2017 forecast

	Real GDP			Inflation			Unemployment rate			Current account			Budget balance		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Belgium	1.2	1.4	1.6	1.8	2.0	1.8	8.0	7.8	7.6	1.0	1.2	1.3	-2.9	-2.2	-2.3
Germany	1.9	1.6	1.8	0.4	1.9	1.5	4.1	4.1	4.1	8.7	8.3	8.0	0.6	0.4	0.4
Estonia	1.1	2.2	2.6	0.8	2.8	2.8	6.9	7.9	8.7	0.6	0.3	0.0	0.1	-0.5	-0.2
Ireland	4.3	3.4	3.3	-0.2	0.9	1.0	8.0	7.0	6.7	9.6	9.5	9.3	-0.9	-0.6	-0.6
Greece	0.3	2.7	3.1	0.0	1.3	1.0	23.4	22.0	20.3	-0.7	-0.7	-0.6	-1.1	-1.1	0.7
Spain	3.2	2.3	2.1	-0.3	1.9	1.7	19.6	17.7	16.0	1.8	1.7	1.6	-4.7	-3.5	-2.9
France	1.2	1.4	1.7	0.3	1.5	1.3	10.0	9.9	9.6	-2.3	-2.6	-2.7	-3.3	-2.9	-3.1
Italy	0.9	0.9	1.1	-0.1	1.4	1.3	11.7	11.6	11.4	2.7	2.1	1.8	-2.3	-2.4	-2.6
Cyprus	2.8	2.5	2.3	-1.2	1.2	1.1	13.3	12.0	11.0	-1.6	-2.1	-2.3	0.0	-0.2	0.4
Latvia	1.6	2.8	3.0	0.1	1.9	2.0	9.7	9.5	9.0	-0.1	-2.5	-3.3	0.0	-1.0	-1.0
Lithuania	2.2	2.9	2.8	0.7	2.1	1.9	8.0	7.5	7.1	-1.6	-2.9	-2.6	-0.5	-0.7	-0.7
Luxembourg	3.8	4.0	3.9	0.0	2.0	2.1	6.3	6.2	6.2	5.3	4.9	5.8	1.6	0.2	0.3
Malta	4.0	3.7	3.7	0.9	1.6	1.8	4.8	4.9	4.9	5.0	5.3	6.0	-0.7	-0.6	-0.6
Netherlands	2.1	2.0	1.8	0.1	1.4	1.4	6.0	5.2	4.7	8.0	7.4	7.1	-0.1	0.2	0.3
Austria	1.5	1.6	1.6	1.0	1.8	1.6	6.0	6.1	6.2	2.4	2.2	2.4	-1.4	-1.2	-0.9
Portugal	1.3	1.6	1.5	0.6	1.3	1.4	11.2	10.1	9.4	0.3	0.4	0.6	-2.3	-2.0	-2.2
Slovenia	2.5	3.0	3.0	-0.2	1.1	2.3	7.9	7.0	6.2	6.3	5.5	5.0	-2.0	-1.7	-1.4
Slovakia	3.3	2.9	3.6	-0.5	0.9	1.4	9.7	9.0	7.9	1.2	1.2	1.5	-2.2	-1.4	-0.6
Finland	1.5	1.2	1.5	0.4	1.5	1.2	8.8	8.6	8.3	-0.5	-0.6	-0.5	-2.2	-2.3	-1.8
Euro area	1.7	1.6	1.8	0.2	1.7	1.4	10.0	9.6	9.1	3.6	3.2	3.1	-1.7	-1.4	-1.4

Source: European central Bank, 2017