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FINAL DEGREE PROJECT

Foreign Exchange Market: EUR/USD Analysis & Forecast

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1. RELEVANCE OF THE TOPIC

The Foreign exchange market has constantly been affected by a wide range of factors and unexpected situations, which have supposed a period of insecurity and uncertainty. Two clear examples could be found – (1) the turndown of Euro/USD influenced by a Eurozone financial crisis [Beker, V. A. (2014)] – (2) the actual situation of covid, that has led to a continuous uncertainty because of the capacity to face such situation. Although financial institutions usually share some data regarding how the market is running, they do not provide always a structured analysis or forecast in order to show the economy's health or it's strengthen/weaken in comparison with other countries. Therefore, this study will absolutely contribute in giving a clear vision in order to understand in which side will the economy move.

Another contribution is providing a clear structure and provide those macroeconomics factors that can have a greater influence over a pair currency exchange rate. This would result highly beneficial for those who are introducing themselves within the FOREX market and want to learn basic and useful knowledge about what to take into consideration when starting operating in such big market, that, according to the 2019 Triennial Central Bank Survey, registered a total of daily average global turnover of $6.6 trillion in 2019.

Additionally, although not being a financial advice, could be considered in order to carry out even a deeper analysis by having a preestablished base, which would arise the possibility to take into consideration those factors that do not have such important influence as the mentioned ones.

The development of the Project will not only have a scientific contribution but also a personal development, highly beneficial for my future professional career. My academic background in Business Administration and Innovation Management, specifically subjects such as short-term investment, finance or statistics, made me arise a strong interest in the financial sector, allowing me to have previous experiences and a basic knowledge before deciding to carry out an analysis and forecast. Therefore, the dedication behind the elaboration of the further scientific project, will provide me the possibility to expand my knowledge in such area of investments.

Then, going further into what has been previously mentioned, an analysis and forecast of EUR/USD exchange rate, does not only determine future movements or how the Eurozone/US economy is running in a period of time, but also, results provide a direct relation with the live quality of all citizens, in terms of financial situation. A clear example could be found when considering the Inflation rate, which according to European Commission Indicators (2021), has resulted in a 4.4% EU annual inflation rate in October 2021. Therefore, the personal reason arises, when realizing that those rates will lead to an increase of the food, energy, among others, prices, resulting in a purchasing power loss.

Finally, as having operated in the Foreign Exchange Market previously, the elaboration of the study will provide me a clear image about the structure that an analysis may follow. Additionally, factors that were not considered in personal situations, will be highly consider for further analysis.

2. FOREIGN EXCHANGE MARKET (FOREX)

Tanamarttayarat, K. (2018), states that the origin of Forex market could be found in the 6000BC when the oldest method was applied known as barter method. Under the barter system goods were exchange for other goods. Eventually, as early as 6th century BC, the first gold coin production took place, acting as a currency although its rough portability, durability, uniformity and limited supply.

Lately, in 1819, England formally adopted gold standards, followed by America 15 years after its standardisation. Once the gold coin was firmly established in such countries, other major's ones such as Germany, France and Japan decided to join.

Forcing into the 1900's, one of the first major transformation of the foreign exchange market, the Bretton Woods System, occurred toward the end of the II World War, reunited the United States, Great Britain and France in order to design a new global economic order.

A study carried out by Igwe, I. O. (2018), explains that the Bretton Woods conference held in July 1944 resulted in the creation of the World Bank (WB), the International Monetary Fund (IMF), and International Trade Organisation (ITO). It was primarily formed to seek "*a common measure, a common standard, a common rule applicable to each and not irksome to any*".

In December of 1971, after the Bretton Woods Accord the Smithsonian Accord, the Smithsonian Agreement came, allowing a greater fluctuation band for the currencies. Two years later, the European community tried to move away from its dependency on the US Dollar, through establishing the European Joint Float by Germany, France, Italy, the Netherlands, Belgium and Luxemburg. After the appearance of some mistakes in the Agreement, in 1973 collapsed, resulting in an official switch to the free-floating system.

In the early 1980, the dollar appreciated greatly against the other major currencies, running a deficit of 3.5% of GDP. Lately, in 1985, the G-5, the most powerful economies in the world (US, Great Britain, France, West Germany and Japan), sent representatives to a secret meeting at the Plaza Hotel in New York City which finalized forcing the G-5 to make a statement encouraging the appreciation of non-dollar currencies. This fact, was seen as attractive for those traders that realised the potential for profit in this new world currency trading.

Bart G. Turtelboom, Thomas J. Krueger, Paul R. Masson. (1997), state in their book that, after the II World War, Europe forged, through the creation of many treaties, to bring countries of the region together. In 1992, the Maastricht Treaty was established by the EU, leading to the creation of the Euro currency. Banks and firms in the EU had the option to operate in euros and, in the first half of 2002, the national currencies of the participating countries were substituted by new notes and coins denominated in euros. At the end, all the EU countries appeared committed to the final goal, with the possible exception of Britain, although some of them may took longer to fulfil the criteria laid out in the Maastricht Treaty.

During the 1990s, the currency market was growing in a more sophisticated and faster way, contributed parallelly in a change of how people viewed and used it. All the advances in communication came during a period when former divisions gave way to capitalism and globalisation and allowed the development of emerging markets, a dramatically fallen of spreads and allowing individuals trading large amounts by accessing to the same electronic networks as International Banks.

Today, the Foreign Exchange Market is considered the largest market in the world where participants can buy, sell, exchange, and speculate on the relative exchange rates of various currency pairs.

According to the 2019 Triennial Central Bank Survey, coordinated by Bank for International Settlements (BIS), the daily average global foreign exchange market turnover reached a total $6.6 trillion, given by $2.2 trillion of spot transactions and $4.6 trillion by traded swaps and other derivatives.

In the constant increasing fast-paced world, the globalization of the communication development will have a huge impact over way of trading in a near future. Cofnas, A. (2018), explores the world of nonhuman-based assisted trading by considering different types of them such as bots, digital trader assistance and deep learning algorithms which can be crucial at defining or establishing a forecasted pair currency value trend or movement.

2.1 Market players

One of the most important players in the foreign exchange market, are the Commercial & Investment Banks, considered to register the greatest volume of currency traded through electronic networks. Their main function is based on facilitating the transactions for the clients and acting as dealers by taking advantage of the bid-ask spread, supposing the financial institution's profit.

Central banks, are also considered to be extremely important in the forex market. The participation of those will determine a great percentage of the exchange rate by which the currency will be traded in the open market. Any action is carried with the purpose of stabilizing or increasing the nation's economy's competition. Additionally, Central Banks use strategies to reduce/calm inflation.

Goodhart, C. A., & Hesse, T. (1993) conducted an analysis in order to identify the most active central banks in the foreign exchange market. At the top, with a greater activeness in comparison with the others, there was the Bank of Japan (BoJ); followed by the Federal Reserve(FED); the Bank of England (BoE); the Bank of Spain; and the Bank of Italy.

Investment Managers and Hedge funds, are considered to be the second largest players group, in parallel with Central Banks.

In the last two more important groups, Multinational Corporations and Individual Investors are taken into consideration. Within the Multinational Corporations, are included those firms that are engaged in importing and exporting, conducting FX transactions to pay for goods and services. Considering the example of a Spanish automotive company that imports China components and finally sells its final good in America. Once the final sale has been completed, the Spanish company must convert back the quantity of dollars received to euros. Then, the company will have to exchange euro to Chinese yuan in order to buy more components.

Lastly, Bilgin, Y., Camgoz, S. M., Karan, M. B., & Yildiz, Y. (2020) consider individual investors as important players but, although its rapidly growing, the volume of FX trades is still extremely low in comparison with financial institutions and companies. According to AMF (2019), 89% of all active retail investors lose their money due to the complexity and risk of the foreign exchange market.

2.2 Market sessions

In differentiation with the other markets, it has a preestablished schedule determined by three different sessions: Asia Forex Session; European Forex Session; North American Session.

Once the liquidity of the market is restored at the start of the week, the Asian market is naturally the first to see action with a considered schedule to run between 11 p.m. and 8 a.m. GMT. After 8 a.m., the European session takes over keeping the market active while the Asian one is coming to a close. Four hours later, from the close of the Asian session, the North American one enters into force, overlapping from 12 a.m. until 15 a.m. with the European session, resulting in a higher volatility market period, usually marked by the activity in New York. (Figure 1)

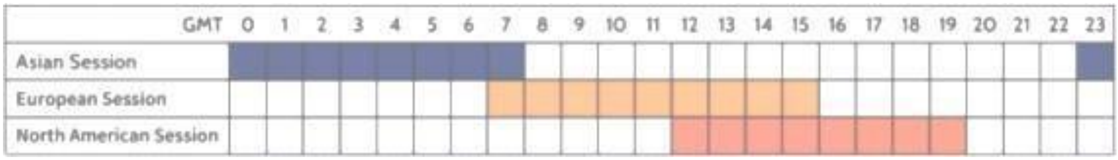


Figure 1: Sessions in the Forex Market from Investopedia

2.3 Main traded currencies

Although there's a wide range of currencies, the Triennial Central Bank Survey determined the most traded currencies by value. In the first position, is listed the USD (United States dollar, 88.3% of daily trades), followed by EUR (Euro, 32.3% of daily trades), JPY (Japanese Yen, 16.8% of daily trades), GBP (Pound Sterling, 12.8% of daily trades) and AUD (Australian Dollar, 6.8% of daily trades) respectively.

When considering the individuals currencies grouped in pairs, tend to follow a similar structure as the previous listed rank. According to the study carried out by Kothiwal, R., & Rajiyan, A. (2019), the main ones are: EUR/USD; USD/JPY; GBP/USD; and USD/CHF.

2.4 Market efficiency

Nguyen, T. (2000), defines the foreign market exchange efficiency as the proposition that the prices presented fully reflect the information available (announcement of Gross Domestic Product, inflation rate, Interest rate, etc.) for the market participants, meaning that, there's no possibility for the hedgers or the speculators to make super-normal profits.

Many studies have been conducted in order to get down to a conclusion whether the market is efficiency or not. Czech, K. A., & Waszkowski, A. (2012), studied its efficiency by taking into consideration the USD/EUR pair currency, the one forward analysed and forecasted in the presented scientific study.

In order to carry out the study previously mentioned, one hypothesis the uncovered interest-rate parity (UIP)[1], was considered as the fundamental parity condition for testing the efficiency, and tested by applying the conventional UIP regression approach test of the forward rate forecast error[2]. After concluding with the pertinent analysis, the author concludes that the results obtained for the USD/EUR market is not efficient in a sense that its participants are not risk-neutral or/and their expectations are irrational.

[1] *Uncovered interest-rate parity (UIP): when the interest rate of one country in comparison with another country equal the relative change in currency rates by considering the same period.*

[2] *Rate forecast error: Difference between the actual volume and the forecast volume expressed as a percentage*

3. EUR/USD BACKGROUND

Although fluctuations were presented over the period 2000-2005, euro strengthened against United States dollar, meaning that residents from other countries needed to spent more of their own currencies in order to buy one euro.

According to the European commission (2005), since 2001, the value of EU exports to OPEC (Organization of the Petroleum Exporting countries) grew at annualized rates of 13% in comparison to 5.5% to the rest of the world. Additionally, an economic recession in the U.S and tax cuts, led to a rapid expansion of budget deficits, resulting in a weaken of the United States dollar.

The combination of the previous macroeconomic results combined with other influenceable factors, led to an appreciation of euro, going from 0.8383 in 2000 (Year low) to 1.5916 in 2008 (Year high).

As we can appreciate in the Figure 2, a reversal movement took place since the registered peak of 1.5916 in 2008. The downturn, was mainly driven by the known "European debt crisis" in which several eurozone member states were unable to refinance their government debt, resulting in devaluation of the national currency.

Beker, V. A. (2014), states that, after the announcement of a larger Greece's debt than the reported was a reality, and the Portuguese, Spanish and Italian public debts became a matter of concern because of their similar debt/GDP ratios with the Greece's ones, in the mid-2012 the financial crisis calmed down. Thus, happened after the announcement by the President of the European Central Bank (ECB), that would become the euro-zone's lender of last resort, allowing the authorities to gain time in order to figure out how they would get out from the debt crisis.

During the last two years, COVID-19 has been considered one of the most influenceable factors in all financial markets. Devpura, N. (2021), after carrying out a study about the relationship of COVID with the exchange rates and oil prices, show evidences that the pandemic has firmly contributed to a continuous change in the economic system through the creation of a predictive regression model. Additionally, observes that oil price has influenced Euro/USD exchange rate but the evidence is very limited.

Figure 2, also evidences the effects of the pandemic during the year 2020 and 2021, reflecting the uncertainty of the market against the different COVID-19 waves in Eurozone countries, resulting in poor growth expectation, which may negatively impact the Euro/USD exchange rate.

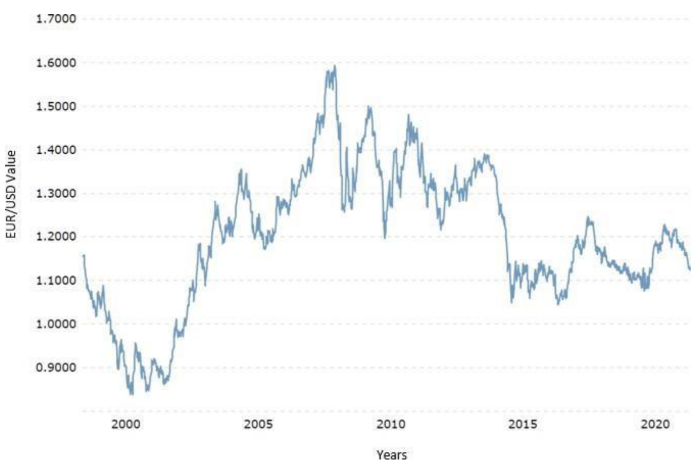


Figure 2: Historical EUR/USD Chart from Macrotrends

4. TECHNICAL ANALYSIS

Mokrička, P., & Hockicko, B. M (2014) defines technical analysis as a technique and discipline employed in order to evaluate and study the past movements of a chart for the purpose of identifying trends and patterns that could repeat in a future.

Many studies have identified an incremental profitability when taking into consideration past structures and movements in order to identify a future trend. Park, C. H., & Irwin, S. H. (2004), concluded that technical analysis has been widely used by market participants in foreign exchange markets, and through a survey carried out during the study showed that, at least, 30% to 40% of practitioners consider technical analysis as an important factor in order to determine a price movement.

Going further with technical analysis, we can acknowledge that is totally structured, in general terms, by indicators and patterns. Patterns are seemed to work directly with the price chart, defined as algorithms used by traders to compute the value of a given indicator applying on price chart. Then, indicators are signals produced by the volume, price or open interest of a security, often repeated over time (Dicks, J., 2010).

Although there are some traders that do not take into consideration technical analysis in order to identify future movements, such as Warren Buffet (Interview CNBC), there's a considerable percentage that consider it unconditional for succeeding. However, in order not to misunderstand the chart language, the application of indicators is usually a must. In the following point, the main indicators used to carry out the analysis, will be explained.

4.1 Main indicators

As we have previously mentioned, indicators help traders to acknowledge the information that provide the charts and allow them to identify possible movements or future trends. Although existing a wide number of indicators, only those established as more important will be taken into consideration.

4.1.1 Supports & Resistance

The concepts of Support and Resistance are two of the most considered attributes when referring to technical analysis. These are used in order to determine price levels on chart that can act as a barrier to prevent the price of being pushed to a certain direction.

Going deeper with the concepts, Support can be defined as a price level in which is expected to stop because of a demand concentration or buying interest, resulting in a potential entry point. Meanwhile, Resistance zones are visible when there's a selling interest after prices have increased, resulting in a potential exit point.

Usually, we can appreciate Support/Resistance levels in two main forms while analysing a chart without prior indicator help. The first one is contemplated when the fluctuations are not following a regular pattern, as we can appreciate in the Figure 3. The second one, can be appreciated during a trendline[3], also, shown in the Figure 3.

Additionally, those levels can be identified with the help of technical analysis indicators such as the Moving Average and Fibonacci Retracement, which will be considered and explained in further points.

[3] Trendline: Line connecting highs or lows to represent support, allowing traders to project the direction and speed of the price.

Figure 3: Own elaboration from Trading View live charts

4.1.2 Moving Average Convergence-Divergence (MACD)

The Moving Average Convergence-Divergence (MACD) has become one of the most considered indicators in technical analysis due to its versatility, meaning that, it allows you to recognize trend reversals as well as strong trends [Appel, G., & Appel, M. (2008)].

Going further to the background of this indicator, it was invented in 1979 by Gerald Appel [Murphy, J. J. (1999)]. The first moving average is driven by the difference between a fast (shorter period of time) and a slow (long period of time) Exponential Moving Average (EMA) of the prices observed in the real market. The second one, known as signal line, is an exponential moving average of the MACD itself, which is overlapped with the MACD [Cardoso, J. P. V. L. (2019)].

The nine-day EMA, known as signal line, is driven by the subtraction of 26-period Exponential Moving Average (EMA) from the 12-period Exponential Moving Average (EMA). Therefore, we will consider buying when the 12-period EMA crosses over 26-period EMA, and selling when the 12-period EMA crosses below the 26-period EMA.

Figure 4: Own elaboration from Trading View live charts

4.1.3 Relative Strength Index (RSI)

The Relative Strength Index (RSI) was presented by J. Welles Wilder, JR in 1978. The indicator has become popular in technical analysis for its ability of price fluctuation measurement and prediction if an asset is being overbought or oversold. [Cardoso, J. P. V. L. (2019)]

Marek, P., & Sediva, B. (2017), after carrying out a study of the Optimization and testing of RSI, concluded that the best strategy to combine with the respective tool was the known as buy-and-hold strategy, meaning that the portfolio is relatively stable for a medium-long period of time. Additionally, states that short time interval situation presented no essential differences to results in comparison with longer time simulations.

The indicator takes into consideration an average of losses and profits during a specific period of time in order to plot the gathered results in a scale from 0 to 100. An overbought signal is visible when the line surpasses the value 70 in the indicator scale and an oversold signal occurs when the line crosses below the vale 30.

Figure 5: Own elaboration from Trading View live charts

4.1.4 Bollinger Bands (BB)

Bollinger Bands (BB) was presented for first time in the early 1980s by John Bollinger. Its popularity comes from the wide range of information that this indicator provides, going from a sign whether to go short or go long, to an image of the volatility that a market is experiencing in a defined period of time.

Bollinger, J. (2002), defines BB in his book as "*Bollinger Bands are bands draw in and around the price structure on a chart. Their purpose is to provide relative definitions of high and low; prices near the upper band are high, prices near the lower band are low. The average is known as the middle band and its default length is 20 periods. The width of the bands is determined by a measure of volatility called standard deviation. The upper and lower bands are drawn at a default distance of two standard deviations from the average*"

Lento, C., Gradojevic, N., & Wright, C. S. (2007), presented a study where the profitability of Bollinger Bands indicator in different market was analysed, concluding that, after applying three different parameters models, the foreign exchange market was the one with greater performance.

The interpretation of BB is constituted as follows:

- Prices go closer to the upper band → *Overbought (go short)*
- Prices go close to the lower band → *Underbought (go long)*
- Bands are more wide → *More volatility (usually riskier)*
- Bands are more contracted → *Less volatility (usually less risky)*

Figure 6: Own elaboration from Trading View live charts

4.1.5 Fibonacci retracement

Fibonacci retracement is based on a numerical sequence discovered and established by Leonardo Pisano, who was considered the most outstanding European mathematician, in the 13th century [Horadam, A. F. (1961)].

Gaucan, V. (2011), states that the indicator has become popular among forex traders because of its usefulness when identifying target prices, stop losses and strategic points for transactions to be placed. Not highly recommended during short-time periods.

Fibonacci's ratios are 0%, 23.6%, 38.2%, 50%, 61.8% and 100%. These ratios are structured in such percentages due to mathematical relationships derived from the Fibonacci sequences (1, 2, 3, 5, 8, 13, 21, ∞). Although 50% is not really a ratio extracted from Fibonacci sequence, it is taken into consideration because of the overwhelming tendency for a vale/asset to continue in a certain tendency once 50% of retracement is completed.

In differentiation with other indicators, Fibonacci retracement allow us to identify which will be the temporary support or resistance of the price over a level established. We can find those situations not only during an uptrend but also during a downtrend.

Figure 7: Own elaboration from Trading View live charts

In accordance to the previous chart, Fibonacci retracement has been applied in a EUR/USD downtrend chart considering Heikin Ashi candles. In this case, the interpretation is divided in the three following points:

1. Swing high at a 1.22608 EUR/USD value rate
2. Low swing at a 1.16639 EUR/USD value rate
3. Price retrace at a 38.2% Fibonacci retracement level, at a 1.18919 EUR/USD value rate.

4.1.6 Parabolic SAR (P-SAR or Parabolic Stop and Reverse)

The Parabolic SAR was introduced by Welles Wilder, Jr. in 1978. In his book "New concepts in Technical Trading Systems", states that P-SAR is based on two components: Time and price. Additionally, explains that the expression of "parabolic" is used in such indicator because when applying it into a chart make a parabola with a line of spots.

Yazdi, S. H. M., & LASHKARI, Z. H. (2012, November), after carrying out an analysis, states that P-SAR is not useful when considering short term fluctuations in a high volatile market but it is useful when analysing real trends for several days/hours.

Figure 8: Own elaboration from Trading View live charts

The interpretation follows an easy structure. When the plots start placing below the pair currency price we will go long and when the plots are start placing above the pair currency price, we will go short.

4.1.7 Candlestick & chart patterns

Candlesticks were presented for first time by Homma Munehisa, considered the father of the candlestick chart patterns and recognised as one of the most successful traders in history. Additionally, it's believed that Munehisa even achieved 100 consecutive winning trades. [Tam, F. K. (2015)]

During the trading history, candlestick patterns have been widely used by traders from all over the world. Orquin-Serrano, I. (2020), after carrying out a mathematical study about the predictive power of adaptive candlestick patterns in Forex market, concluded that candlestick patterns have shown adaptability when determining which pattern establishes the best entry condition for trading strategies.

Although being a wide range of candlestick patterns, we can split them on three major groups: Bullish Candlestick patterns; Neutral/Basic Patterns; and Bearish Candlestick patterns.

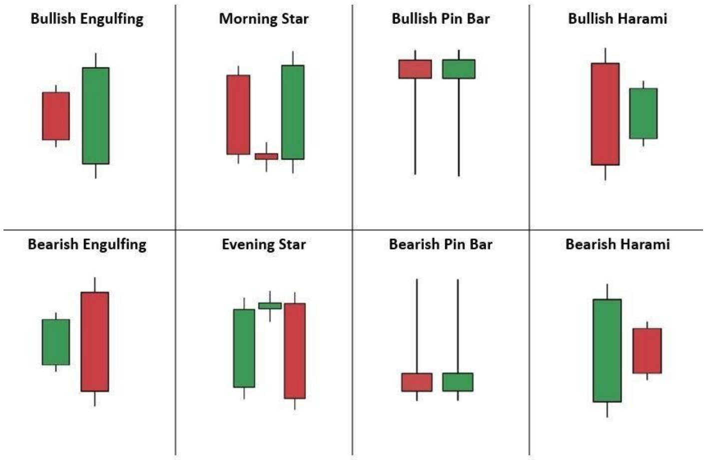


Figure 9: Candlestick formations from PayForex

5. FUNDAMENTAL ANALYSIS

Fundamental analysis is considered to be the process of studying and analysing the impact of those economic, political and social factors that could affect the relative value of a currency. Therefore, the act of trading is totally based on global aspects that influence the currencies' demand and supply, equities and commodities.

Since the establishment of both (technical and fundamental) analysis, the controversy of which has a greater level of effectiveness has been increasing along the years. In the last decade, fundamental analysis seems to have a predominance over technical analysis because a wide number of renown fund managers consider themselves to be fundamental analysts, such as Liu Yang, Peter Lynch, Warren buffet, etc.

Jenni L. Bettman; Stephen J. Sault; Emma L. Schultz (2009), after carrying out a study to determine whether the fundamental analysis performed better by being complemented with technical analysis or not, concluded that a greater profitability is presented with the application of both together.

In addition to the previous comparison, Thomas Oberlechner (2001), established an individual forecasting horizons approach in order to identify whether a total of 289 foreign exchange traders considered their strategies more "fundamentalism" or "chartist". Results provided in the Figure 1, considering the value "<1 = pure chartist analysis approach" and "<10 = pure fundamental analysis approach", evidences a more remarkable tendence to a fundamental analysis rather than technical.

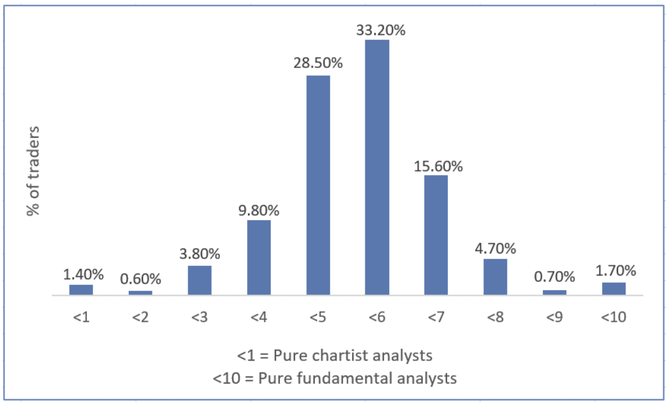


Figure 10: Overall forecasting approaches of FOREX traders

In the following points, those main macroeconomic factors that have a direct impact over the EUR/USD pair currency will be briefly explained and developed in the further analysis carried out.

5.1 Main macroeconomic factors

5.1.1 Central Banks

As pointed in previous points, Central Banks are considered extremely influenceable over a country's currency value. Generally, interventions are carried out because of the necessity to stimulate the economy or maintain a desired exchange rate.

In order to get an approach about the main interventions considered in the further analysis and forecast, five subcategories are presented.

- **Operational intervention**

Operational intervention is the one that people mean when referring to Central Bank intervention. The process consists on buying and selling both foreign and local currency in order to set up the exchange rate to a targeted level. The movements of the market will be totally driven by the sizes of these transactions.

- **Concerted intervention**

Concerted intervention takes place when a coordination between several nations agree to drive up or down a certain currency by using their own foreign currency reserves. The results will be dependent upon its depth (total amount that will be considered for the intervention) and number of countries involved in the intervention. Additionally, the concerted intervention can also be implemented verbally, when officials from the nations involved unite in order to express their concern over a significant appreciation or depreciation of a currency.

- **Public debt**

Although the fact that countries engage extensive deficit financing to pay for public sector projects and it's been perceived as a stimulation of the domestic economy, those nations with large public debt are less attractive for foreign investors and stir up inflation.

Considering the worst scenario, a government would have to print money in order to face part of a large debt, but an increment of money supply would cause inflation. Therefore, foreigner will be less willing to own securities denominated in the specific currency if the risk of threat is considerable.

Kumar, M., & Woo, J. (2010), after studying the relation between the public debt and economic growth of a country, provides empirical results about a direct impact of high public debt on successive growth of GDP per capita. Moreover, states that large public debts are likely to impact negatively on the economic growth, reducing its potential.

- **Money supply**

Money supply is defined by Oxford dictionary as "Total amount of money in circulation or in existence in a country".

When central banks increase the amount of money circulating in the economy, encourage private consumption and decreases the interest rate leading to an increment of lending/investments, leading to a long run depreciation of its currency.

In the opposite situation, if the Central bank decreases the money supply in the economy by selling bonds from its account, would lead to a proportional long run appreciation of its currency.

Cornell, B. (1982), after studying the correlation between money supply and changes in interest rate, states that results provided clearly imply that money supply announcements have a significant impact on the real rate of interest.

- **Interest rates**

Central banks usually set interest rates in order to maintain a desired exchange rate. When high interest rates are presented, lenders of an economy are offered with a higher return relative to other countries, leading to an attraction of foreign capital. Therefore, causes the exchange to rise.

In the contrary, lower interest rates are usually established in order to stimulate economic growth by encouraging the act of borrowing and investing, leads to a decrease of exchange rates.

5.1.2 Inflation & Consumer Price Index (CPI)

Inflation is one among many factors that can influence the exchange rates, but it has to be considered as can have a considerable impact over the country currency's value.

Inflation presents a greater possibility to have a significant negative effect instead of a significant positive effect, on the determined value of the currency. A low inflation rate does not result always in a favourable exchange rate for a country, whether high inflation rate it's more likely to negatively impact over the country's exchange rates in comparison with other nations.

Bryan, M. F., & Cecchetti, S. G. (1993), after studying the correlation between Consumer Price Index (CPI) and inflation, provides evidences that using a dynamic model (behaviour of an object price over time) were able to compute the common inflation element. Additionally, it is mentioned that CPI is considered one of the most important indicators of inflation.

Generally, considering CPI as a measure, the interpretation would be as follows:

- A *CPI greater than expectations* - meaning of inflation pressure and a central bank could potentially raise interest rates, which could result in an increase of a country currency's value due to it tends to attract foreign investment and increase demand.
- A *CPI lower than expectation* – possibility of being countered with lower interest rates, leading to a currency weakening.

5.1.3 Influence of politics

Along the history, it has been identified that sharpest moves in the foreign exchange market, as well as in other financial markets, has been caused by political factors rather than economic events.

Blomberg, S. B., & Hess, G. D. (1997), after comparing the relation between politics and exchange rates, presents evidences that exchange rates are sensitive to political factors regardless of the inclusion of those economic variables that drive financial market. Therefore, it is mentioned, that part of a poor performance when trading, is directly attributed to the total omission of political factors.

A clear example could be found once the Brexit votes took place, resulting in a considerable fell of GBP (UK Pounds)/USD (US Dollars) from roughly 1.50272 to 1.32338.

Figure 11: Own elaboration from Trading View

Elections are usually seen as events with a large impact over the financial markets in general. These situations can be viewed by traders as a multiple trading opportunity due to is potential political instability and uncertainty. Therefore, it is known that uncertainty, disbelief and mistrust can lead to more rapid movements in the market.

Garfinkel, M. R., Glazer, A., & Lee, J. (1999), after examining the behaviour of the size forecast errors implied by futures contracts for exchange rates around elections, provides evidences that elections would not affect the exchange rate if the results were foreseen and different candidates adopted the same policies. Additionally, suggests that the identity of the winner can matter for the traders' behaviours and can result in a surprising outcome.

5.1.4 Employment rates, GDP & Economic growth

Employment rate represents the total number of paid workers of any business. Commonly, the data is extracted from the labour markets, such as US non-payrolls, and can have a significant impact over the indices and forex. The employment report is released on the first Friday of each month.

The interpretation of employment rate is usually conditioned by the expectations of non-farm payrolls. If payrolls come in below expectations there's more possibility of a weakening of the currency, whether a beat of expectation, could lead to an increase of the currency's value.

Sanchez, J. M., & Liborio, C. S. (2012), has been studying the relationship between the GDP growth, unemployment rate and employment. Results provided, clearly evidence a relationship between Gross Domestic Product and the employment ratio. Historically, a 1 percent decrease in GDP was associated with a slight 2% increase in the unemployment rate (Okun's law), but changes were presented in the study through the creation of a scatterplot and a further analysis, showing that this difference has changed since the Great Recession of 2008 by being more variable.

Gross Domestic Product, is considered a measure of all services/goods produced during a specific period of time and a sign for the Central bankers and investors to know if the economy is getting stronger. An increase of the GDP leads to an increase of the economy, meaning that companies generate greater profits and people earn more, which influences a currency to appreciate.

Trinh, T. H. (2017), highlights the direct relation between GDP and economic growth, and formulates two ways of increasing it of the economy: Capital accumulation and Technological innovation. Therefore, an increase of GDP will considerably influence the economic growth of a country, leading to an increment of its currency' value.

5.1.5 Purchasing Manager's Index (PMI)

Purchasing Manager's Index (PMI) is the result of a survey, in which not less than four hundred purchasing managers, related to private sector companies, are asked to analyse and rate the actual situation of the company, considering the evolution of areas such as employment, inventories, supplier delivers and increment/reduction of new orders.

Managers have to answer one of the three possibilities provided, which are: better conditions, similar to last month, or worse conditions. Once the answer has been submitted, are compiled in one single release, known as Purchasing Manager's Index (PMI).

Being precisely, in the case that results of PMI dips below the fifty level, will mean that the economy enters the recessionary territory (contraction). Meanwhile, a reading above 50, will indicate an expansion in the sector, resulting highly beneficial for the exchange rate of the pertinent country's currency.

Kilinc, Z., & Yucel, E. (2016), after analysing the correlation between PMI and GDP growth through regression lines, states that PMI is one of the most important indicators in order to carry out a reliable forecast of the GDP growth. Additionally, found that one point increase in PMI can be associated with a 0.1 to 0.2 percentage points increase in GDP growth.

6. SUM UP THEORETICAL FRAMEWORK

Foreign Exchange market is considered the largest market in the world. According to the 2019 Triennial, the daily average global turnover reached a total of $6.6 trillion, given by $2.2 trillion spot transactions and $4.6 trillion by traded swaps. In the constant increasing fast-paced world, the globalization will have a huge impact over the way of trading as digital trader assistance, deep learning algorithms and bots can be crucial when defining future movement.

During the theoretical framework, main players have been mentioned. In the first position, wewould find Central Banks, as they can determine a great percentage of the exchange rate. Investment managers and hedge funds can be considered the second largest players group followed by Multinational Corporations, including those that are engaged in importing and exporting, conducting FX transactions to pay for goods/services. Finally, we find the individual investors, supposing an extremely low volume of FX trades in comparison with the other players.

In order to carry out the analysis in the most accurate way, technical and fundamental analysis will be taken into consideration. Additionally, the expectations of the market (sensitivity analysis) will be studied and further analyzed. Therefore, some indicators have been chosen as well as those macroeconomic factors that have a direct impact over the euro/USD exchange rate.

On the one hand, *technical analysis* can be described as a technique and discipline applied in order to evaluate and study the past movements of a chart with the purpose of identifying trends and patterns that could repeat in a future. The indicators that will be employed are: Support/Resistance; Moving Average Convergence-Divergence (MACD); Relative Strength Index (RSI); Bollinger Bands (BB); Fibonacci retracement; Parabolic SAR; and Candlestick & Chart patterns.

On the other hand, *fundamental analysis* can be described as the process of studying and analyzing the impact of those economic, political and social factors that could affect the relative value of a currency. Therefore, in order to analyze and forecast the possible futures movements of euro/USD exchange rate, main macroeconomic factors that will be considered are: Central bank operations; Politics; Inflation & Consumer Price Index (CPI); Employment rates, GDP & Economic growth; and Purchasing Manager's Index (PMI).

7. OBJECTIVE OF THE STUDY

The objective of this study will be based on providing a clear vision, an analysis and approach of which will be the future tendence of EUR/USD exchange rate value. Therefore, the objective is directly related with the formulated question: **Will euro strengthen against US dollar in a time frame of 1 year?**

As seen previously in the EUR/USD background review, the determined exchange rate has experienced two main tendences during the last 20-years' time frame. The first one was consolidated due to a rapid expansion of budget deficits, among other factors, that influenced negatively the US currency value, leading to a strengthen of euro between the period 2001- 2008. After 2008, financial markets were full of insecurity given by the known "European debt crisis", which consolidated a downtrend that has persisted until the actuality.

During the last 2 years, Covid-19 has gain considerable importance in the financial market, becoming a nightmare for the majority of traders for its instability and uncertainty. But, **how will be the future of the EUR/USD exchange rate? Will the Eurozone economy be healthier than the United States one?**

Some important institutions such as Barclays, Bank of America or ING, have speculated how could be a general tendence when considering EUR/USD exchange rate, but they have not presented detailed analysis neither a solid result, leading to multiple results, very different from each one.

Therefore, the main objective is to determine if euro will strengthen in comparison with US dollar by providing as much accurate results as possible, through the application of those technical indicators and macroeconomic factors previously exposed.

8. METHODOLOGY

In this study, the combination of two different analyses are proposed to develop the research question and provide reliable results with a solid background – (1) Technical analysis, through the application of technical indicators, will provide us an approach of how the EUR/USD exchange future value could be consolidated and (2) Fundamental analysis will allow us to extract statistical and valuable information to determine how the Eurozone or US economy is running, a clear sign of possible changes in the Foreign exchange market behavior. Additionally, a survey will be conducted in order to identify the main opinions from knowledgeable people in thefinance sector. This, will contribute to the determination about whether or not the conclusions have been achieved in parallel with the results extracted from the survey.

9. ANALYSIS & FORECAST

9.1 Technical Analysis

In the point 4.1 of the study, main indicators have been established and taken into consideration in order to develop the technical analysis in an appropriate way aligned with the objective of bringing solid and valid results based on the Euro/USD historical chart. Therefore, a 1-week chart will be considered and analyzed by taking a maximum of ten years' time frame into consideration.

In each specific indicator analysis, a brief conclusion will be provided, showing the application in the graph and the possible future movement of the currency's exchange rate. Once all of them are concluded, a general technical analysis conclusion will be formulated by considering the whole brief conclusion stated individually.

It is important to realize that only considering technical analysis doesn't mean a guaranteed and valid forecast. Therefore, a further fundamental analysis will be carried out in order to present as much accurate results as possible.

9.1.1 Support & Resistance

In order to appreciate the establishment of support and resistance levels, a chart of more than 10 years will be provided in this particular case. Additionally, another extra chart, with shorter time frame will be evaluated. Thus, will allow us to identify possible secondary resistance/support levels and increment our accuracy.

Figure 12: Own elaboration from Trading View 2009-2022 (Analyzed 28/02/2022)

In the previous Figure 12, we can identify two main levels of support/resistance in which theexchange rate experiences a reverse movement. Just those that will be relevant for the results are considered in the graph.

After a considerable depreciation of euro against USD at the end of 2008 until the midyear 2014, three rebounds (point 1, 2, 3) consolidate the establishment of a support level below 1.2500, becoming a point of reference and interesting for those long-term investors.

While these continuous rebounds used to take place over the years, the fast economic recuperation of United States against other countries, made investors think of a possible reverse and supportlevel breakout. Finally, the feelings became true at the end of 2014, a radically depreciation of euro/USD occurred, reaching low values and the beginning of a new era of supports and resistance levels.

After this considerable market change, the previous considered support level became the new resistance one, leading to an establishment of a new support zone above 1.050.

Points 5,6,7 and 9 are clear evidence of a support level behave, once the price reaches the area, immediately rebound in the opposite direction. On the other hand, points 8 and 10, show how a resistance level behave, once the exchange rate touches the zone, a reverse trend begins.

An important fact to point out, is that a clear funnel has been established since the minimums of 2015 until the actual value. Thus, it is considered to be an important and interesting sign to know possible future movements.

In order to find secondary support/resistance levels, a shorter time-frame chart is analyzed.

Figure 13: Own elaboration from Trading View 2015-2022

In the Figure 13, we can appreciate the establishment of a secondary zone that can act as support or resistance level.

From one side, points 1,2,4,5 and 6, show a clear evidence of resistance level, not allowing the price to surpass the value of 1.1600 and creating a reverse movement that will be further stopped by the major support level explained in the previous point. From the other side, there's the point 3, which acts as a support after a partial depreciation, considering the funnel limits.

Conclusion Support/Resistance

After analyzing the possible main and secondary support/resistance levels, information has been excluded and interpreted in order to provide a result.

One of the first points to consider, is that the price has been operating within a funnel since 2015 with determined maximums and minimums. Additionally, it has recently began a possible reverse trend movement (point 6), which could be crucial to determine further range values.

Keeping this in mind, the application of those levels presents a further depreciation of euro until reaching values of 1.0700. Always considering the risks aggregated to this kind of operations, we have to take into account that there's the possibility of a breakout in levels of 1.0700 which would lead to a further depreciation.

9.1.2 MACD

As pointed out in the theory, the Moving Average Convergence-Divergence is one of the most considered indicators as it allows you to identify/recognize strong trends reversals. A 10 years chart will be considered, as well as another with a shorter time frame, which will present the necessary information in more detail.

Figure 14: Own elaboration from Trading view 2012 – 2022

In the figure 14, we can appreciate the application of the indicator over the graph and the differentiation between the considered signal line (orange line) and the MACD line (blue line). As a recap from the theory, we should consider buying when the Signal line crosses over the MACD line, and sell, when the signal line crosses below the MACD line.

By carrying out an analysis of the previous ten years, we can highlight six main points that could be of our interest in order to predict future movements in consideration with the history exchange rate behavior.

As visible in the previous chart, the odd points, are a clear reverse movement as the signal line crosses above the MACD line, indicating a further appreciation of euro against USD. On the other hand, the even points act in the other way around, resulting in a further depreciation of euro against dollar, as the signal line crosses below the MACD line.

In order to extract clearer information, a shorter time frame chart will be presented and analyzed.

Figure 15: Own elaboration from Trading view 2017 – 2022

By considering a shorter time frame, more points could be considered as relevant in order to understand the behavior of the Moving Average Convergence-Divergence, indirectly resulting in a more accurate analysis.

In the beginning of 2017, a continuous and relevant appreciation of euro against USD took place (point 1), which drove the exchange rate at a maximum value, after a correction of the price (point 2), at levels of 1.2319 (point 3), since the extreme depreciation of 2014-2015. One year later, in 2018, the indicator showed a clear reverse movement, not highly beneficial for the euro investors that were going long, resulting in a long-term depreciation of euro until June 2020.

Once the long-term depreciation began to consolidate at the point of 1.0600 (point 4), the indicator began to show a possible reverse movement, detrimental for the USD but highly beneficial for the eurozone currency. After the price was operating in an established funnel (highlighted with a rectangle), finally, a breakout was presented, supposing the beginning of an appreciation of euro.

Repeating the same behavior as previous years, once the price reached maximums, since the drop of 2014-2015, the price began, again, a reverse movement, presenting a pattern known as double top (point 5 and 6). During this period, we can appreciate how the signal line was beginning to cross below the EMA line, and finally, resulting in such depreciation of euro.

By taking into consideration the indicator signal, it doesn't seem the beginning of a reversal movement for the moment without discarding that this could change in a near future, as the price is getting closer to the minimums established in the first part of analysis (Support and resistance).

Conclusion MACD

As we can appreciate, MACD tends to be an accurate indicator in order to identify possible reverse trend movements.

In this particular case, after carrying out the analysis of two different time frames, the price is reaching minimums since the drop that took place in 2014-2015, meaning that a possible reversal movement could take place in a near future.

Although that being said, for the moment, does not seem to present signals of an immediate appreciation of euro against USD, as the signal line is continuing in the decline direction.

9.1.3 Relative Strength Index (RSI)

The Relative strength index indicator (RSI) is considered one of the most accurate indicators, followed by MACD, in several financial markets for its capacity to interpret, in an easy way, when a currency is overbought or oversold. As pointed in the theory, when the line crosses over the value 70, a signal of overbought is presented, meaning that we should consider the option of going short. On the other hand, when the line crosses below 30, a signal of oversold is presented, meaning that we should consider going long.

Following the same structure as the previous points, a 10-year chart will be firstly presented, followed by a shorter time frame, that will allow us to recognize in more detail the structure of behavior.

Figure 16: Own elaboration from Trading view 2012 – 2022

The Relative Strength Index does not present any difficulty when interpreting because of its easy structure.

By considering the Figure 16, we could highlight five point that could have a relevant importance when analyzing future movement. The first one, follows the same pattern as the previous one, which rebounds just at the level 30, resulting in a further appreciation of the euro value against USD.

Two years later, in consequence of the considerable exchange rate drop, we find that the indicator crosses below the level 30 again, a clear sign of an oversold currency, meaning a further appreciation of euro from 1.04588 (point 2) to 1.1420.

During the next two years, not a great volatility is presented as the price is fluctuating within afunnel until 2017. Once the signal line is getting closer to the Oversold zone, a breakup take place, situating the price over the resistance level established during the previous year's funnel, resulting ina roughly one-year appreciation of the euro exchange rate (point 3).

Then, considering the point 4 and 5, we can appreciate that the signal line is getting/touching the overbought zone, resulting in a further depreciation in both cases. This depreciation is also influenced by the mid-2012 support level which is converted into a resistance one, as previously explained in the support/resistance part.

Conclusions RSI

After having carried out all the analysis considering the relative strength index indicator (RSI), we can appreciate a clear depreciation of the EUR/USD exchange rate, which could continue until reaching the support level previously mentioned in the first point. As the signal line is getting into the oversold zone is expected a rebound of the euro, which would result in its appreciation against United States dollar.

9.1.4 Bollinger Bands

As pointed previously, Bollinger Bands has become very popular between traders/investors because of the wide range of information that this indicator provides, going form a sign whether to go short or go long, to an image of the volatility that a market is experiencing in a defined period of time.

Figure 17: Own elaboration from Trading View

When considering the volatility presented by the indicator, we can clearly appreciate how during the period 2018-2020 could be considered the one with lower volatility in comparison with the historical 10 years general chart. On the other hand, in the initials of 2022 we could be experiencing one of the major volatility that has ever presented since 2008 in the euro/USD exchange rate, which is mainly driven by the Ukraine and Russian conflict.

Going deeper into detail, seven points can be highlighted as the most important ones. First of all, the point 1 show us how the value of euro after constantly hitting the upper band, breaks down the 20-period moving average (middle band), starting a downtrend until reaching 1.0400. Once the consolidated minimum price was consolidated, a two-years channel took place composed by fluctuations between the minimum and the maximum 1.1400. In the point 3, we can appreciate how after hitting the lower band, the price began a reverse movement and trend which would result in a break of the maximum and a further appreciation of euro against dollar until reaching point 4.

From the point 4 until point 5, a downtrend is presented after hitting the upper band and breaking down through the middle band. During this period, a low volatility can be assumed as bands are more contracted. Additionally, it should take into consideration that, during the mentioned period, the price only operates under the 20-period moving average.

Finally, we can appreciate a further uptrend and, after hitting two times the upper band, a revers amount takes place until reaching the point 7. The instability of the conflict between Ukraine and Russia, and the important role of Euro and United States, has resulted highly detrimental leading to an important depreciation of euro.

Conclusions Bollinger bands

Due to the instability of this last, roughly, 7 months, we should be patient in order to accurately forecast the next movement. Although this statemen, generally analyzing, we can appreciate the price is only operating between the lower band and the 20-period moving average, which is a sign that this might change during this year. Additionally, combined with the support point previously commented, we could expect a rebound of the euro value, resulting in an appreciation of the euro/USD exchange rate.

9.1.5 Parabolic SAR

Parabolic SAR indicator is based on two components: Time and price. Allow us to understand whether to go short or long.

Figure 18: Own elaboration from Trading View

As this indicator has not a high level of complexity, its analysis is simple to interpret. Considering the chart and the objective of the project, I'll take into consideration the last period from roughly July 2021 until the actuality.

As presented, the line of spots is clearly situated over the established candles and does not seem to reverse immediately. Therefore, it doesn't show evidences that euro will tend to an important depreciation for the moment.

Conclusions Parabolic SAR

As pointed in the analysis, the indicator shows not an immediate reverse movement of the euro/USD exchange rate, although this is not totally valid without considering the whole indicators together. Additionally, the conflict between Russia and Ukraine has to be taken into consideration as it is an important factor that affects directly the value of both currencies.

9.1.6 Candlestick & Chart patterns

As previously mentioned, Candlestick patterns have shown adaptability when determining which pattern establishes the best entry condition for trading strategies. Thus, some patterns/candlesticks formations may be presented in the historical euro/USD chart.

The different patterns and formations identified will be accurately analyzed with several charts with the objective to carry out a comparison with different timeframes.

Figure 19: Own elaboration from Trading View

Analyzing a long-term timeframe, since middle 2013, we can easily appreciate the formation of two double tops, which has been extremely important for the currency's value.

The first point in the chart, could be considered to have a greater impact over the currencies due to, after the break down, the price of euro started to depreciate until reaching minimums, not seen since a long time ago. Going through the second point, after having euro gained some strength in the market, during the 20/21 period, and being conditioned by the resistance established level, we can appreciate the same formation which, finally results, in a further decrease of euro.

Figure 20: Own elaboration from Trading View

Going through a shorter time period, many patterns can be found and further analyzed. Those will be structured in order to see it clearly and more understandable.

Bearish triangle: When a formation of a flag is consolidating, we must be patient in order to know which is the next movement. An anticipation of the investment could result in high losses, that could be seen incremented if a stop loss in not taken into consideration.

Considering the first point, the formation of the triangle comes from a clear appreciation of euro against dollar since 2017. After consolidating the flag or, also known as bearish triangle, a brake down was presented, pushing back the euro value.

Going through the sixth point, we can also see a bearish triangle but this one has the peculiarity that it was formed during a downtrend. A clear difference between this one and the first point, is that the sixth one, after being consolidated, continued with the same trend and didn't go to the opposite way.

Bullish triangle: The third point, although it is similar to the first bearish triangle, this one is the other way around. It is formed during a down trend but, after its consolidation and brake up, the euro started an important appreciation.

Down trend funnel: The second point, after the euro value broke down, a down trend funnel was being consolidating with lower highs. The peculiarity of this kind of funnels, is that it allows you to know that a rebound could take place, making easily the decision to go short or long. Additionally, although having presented a funnel, we have to keep in mind that a reverse movement could also be a possibility.

Double bottom: The fourth point, as we can appreciate a double bottom has been established as a way of continuation of the uptrend. Immediately after the continuation, as mentioned previously, a double top formation makes all the euro value move on the opposite direction.

3 Descending Pics: The fifth point, the chart provides us a formation of 3 descending peaks, a clear sign that the down trend is established and will continue in the same direction.

Conclusions Candlestick & Chart patterns

As we have appreciated in the previous charts, there are a lot of different formations to take into consideration, and even more when the time period or time frame analyzed is shorter.

Will it be a doble bottom? Or another triangle or flag? For the moment, there's not a defined pattern to rely on, as we must wait in order to see an establishment. Considering such time frame of one week per each candle, the formation of a pattern, will be obviously, with a lower speed as it was a shorter time frame. Therefore, in this case, it is recommendable to check possible patterns visible in shorter time periods, but considering that results will probably come earlier.

9.1.7 General conclusions technical analysis

The technical analysis has resulted highly beneficial in order to understand which could be the next movement of the euro/USD exchange rate. Therefore, all the previous points will be considered in the following conclusions.

As we saw in the Support and Resistance analysis, the price was fluctuating within a primary channel since the minimum established in 2015 (figure 12). After looking in more detail, we appreciated that a secondary funnel was consolidating and gaining relevance within the exchange rate. Thus, in 28/02/2022, when the analysis was carried out, the value was around 1.1100, with an expected forecast of a further depreciation of euro/USD, until reaching the previous support level between 1.0600 and 1.0400.

After three months, mainly driven by the consequences of the covid pandemic and the Russian and Ukraine conflict, the forecasted results have been successfully achieved because of the high volatility presented during this determined period. In the actuality, the exchange rate stands on 1.0600, expecting the price to reach the support level and rebound, resulting in an appreciation of euro.

Considering the indicator MACD, analyzed on 28/02/2022, we have already the results and a clue of which could be next movement. As in the previous point, the forecasted went also as planned, the euro depreciated from 1.1100 until 1.0600, with further expectations of a rebound and appreciation of euro currency.

The same happens with the RSI indicator, analyzed on 02/03/2022, was not showing the signal in the overbought area, but there was established a clear downtrend within the indicator itself, so we expected a further depreciation of euro. After 3 months the expectations has been fulfilled, as euro exponentially decreased against its competitor, USD.

Going through Bollinger Bands, analyzed on 15/05/2022, the value of the pair currency was standing in the level 1.0600, meaning that was touching the support point. As appreciated in the chart, the price was operating since June 2021, below the 20-period moving average. Thus, could be a sing that a rebound of the price could take place in a short term, but not expected to be immediately.

Considering the Parabolic SAR, analysed on 15/05/2022, does not seem to show an immediate reverse movement of the currency's pair value, although it's getting into the support level. Additionally, the chart doesn't present any significant determined pattern, meaning that it will require time in order to have an established one.

After grouping all the indicators together, we can just extract one result, a rebound is next to the corner, leading to an increment of the euro/USD exchange rate. Although this statement, we have to consider that, the market is experiencing a moment of high volatility, and this can directly affect the forecast.

9.2 Fundamental analysis

As seen previously in the theoretical framework, the fundamental analysis is considered to be the process of studying and analyzing the impact of those social, economic and political factors that could have a direct impact over a currency exchange value. Widely used between known investors, such as Liu Yang or Warren Buffer, it is considered to have high effectivity over the investment's positions.

Although there are investors that consider themselves more fundamentalists and others more chartists, it has been proved that the combination of both, results with a greater probability of getting profits from the initial invested capital.

In this section, the most relevant macroeconomic factors will be considered and further analyzed. In some of them, several sources will be checked in order to provide a more accurate result. Additionally, the Euro area, as being considered the euro as home currency, will be more accurately analyzed in comparison the US factors, which will be analyzed in a more general way. Thus, will allow us to understand and have more detail about how the home (Euro Area) is running.

The structure of the analysis will be the same followed in the technical analysis. Firstly, the information of different sources is going to be presented. Secondly, for each macroeconomic factor, a conclusion will be made up and, finally, a general conclusion of all the factors analyzed will be proposed.

9.2.1 Central Bank

The European Central Bank started publishing the quarterly data of its interventions in the foreign exchange market in order to provide a reporting based on transparency and showing the ability of their capacity of intervention in an effective manner.

Going into details of historical interventions, we can identify that the last intervention was produced on 18/03/2011 with the EUR/JPY exchange pair currency. Going even more in the past, we can find four interventions over the analysed EUR/USD exchange rate during the third and fourth quarter of 2000.

After the instability period and the continuous decrement of euro, it is suggested the possibility of direct currency intervention after 22 years, an extremely rare event. Some recognised investors such as George Saravelos, Deutsche Bank's head of global currency strategy states that ECB should go a step further and intervene in EUR/USD due to its depreciation is already resulting in an economic damage. He also states "the single most efficient way to ease inflationary pressures in the euro zone at the moment is via a stronger euro" which is directly affected for the constant increment in oil and natural gas prices.

According to the European Central Bank, the interest rates considering the deposits from corporations with an agreed maturity of up to one year, stays almost constant at -0.31% in March 2022, while the interest rate on overnight deposits from corporations stayed around -0.04%. Moreover, the cost of borrowing for new loans to corporations increased by 7 points until reaching 1.49%, while considering the new loans for to households for house purchase increased by 9 points standing at 1.47%.

Going through the Fed Interest rate, it has experienced an increment of 0.25% in comparison with previous percentages. Additionally, it is expected a further increase which could arrive at 3.2% before 2023.

Conclusions Central bank

After all being said, the EUR/USD exchange rate could be directly affected in the case of an intervention from the European Central Bank. Although there's no actual expectative of to happen, there's nothing to consider in a short time period.

Considering the global interest rate in Europe, which stands at 0% with an expected increment to 0.5% at the end of 2022, and the US interest rate, which stands at 0.25% with an expected increment to 3.2% at the end of 2022, we can expect a lower US economic growth in comparison with the Euro area because of the forecasted increment presented. Thus, will encourage the act of borrowing and investing.

9.2.2 Inflation & Consumer Price Index (CPI)

Inflation

In order to carry out a more accurate analysis about the forecasted inflation, recent predictions will be taken into consideration, as well as some graphs that will allow us to make it more understandable. Additionally, historical data will be shown.

Considering the last ten years, the euro area inflation percentage has presented fluctuations between the 4% and the -2%, which can be considered "normal" for an economy, but everything radically changed since October 2021 as the maximum "normal" level previously established was surpassed registering a 4,1%.

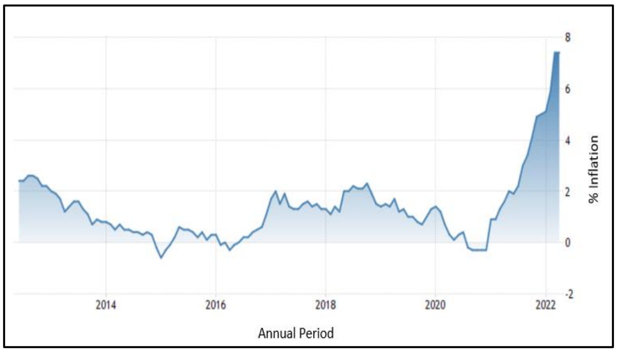


Figure 21: % Euro Area Inflation Chart from Eurostat

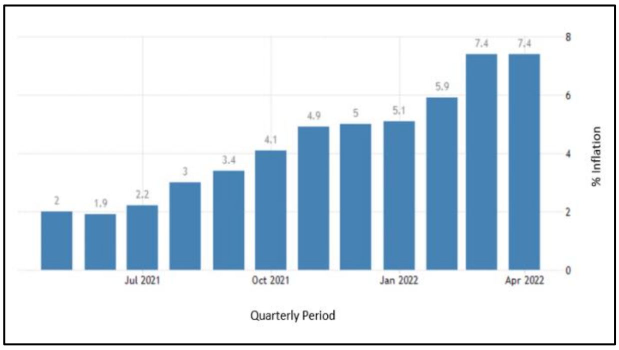


Figure 22: % Euro Area Inflation Chart from Eurostat

According to Eurostat, the annual inflation rate in the Euro Area started its exponential growth after October 2021, when it incremented from 4.1% until 4.9% and 5% consequently. After this unusual registered percentage of inflation, the consequences of the coronavirus pandemic and the Russian invasion of Ukraine led to a generalised rise in consumer prices, resulting in a, never appreciated, historical inflation maximum levels.

As stated in the figure 21, in April 2022 a 7.4% of annual inflation rate was revised, remaining at a record high level. The main increase is occasioned by the energy (44.3% in March); followed by services (2.7% in March); food, alcohol and tobacco (5%); and non-energy industrial goods (3.4%).

In the actuality, the inflation is more than three times over the European Central Bank (ECB) target of 2%, and an immediate pullback is not expected because of the Russian and Ukraine conflict previously explained resulting in a generalised rise in consumer prices.

Inflation Forecast (EU vs US)

In order to present a more visual forecast, two different graphs will be provided. The first one considers a 10 years' time frame, provides the curve of the % annual inflation tendence, highlights the zone, and shows the expected movement of the inflation in the next months. On the other hand, it is shown a column bar with a shorter time frame, from July 2021 to July 2023, provides the curve of the inflation value, and presents the expected inflation movement for the next months.

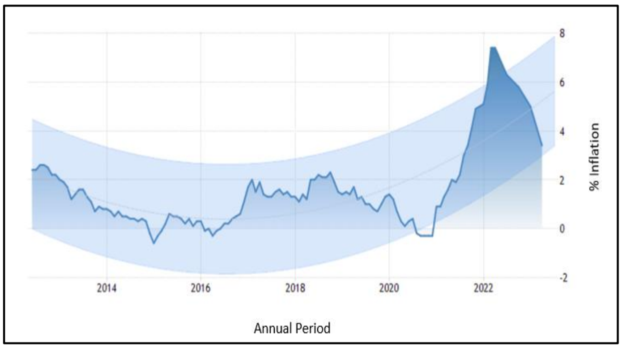


Figure 23: % Euro Area Inflation Chart from Eurostat

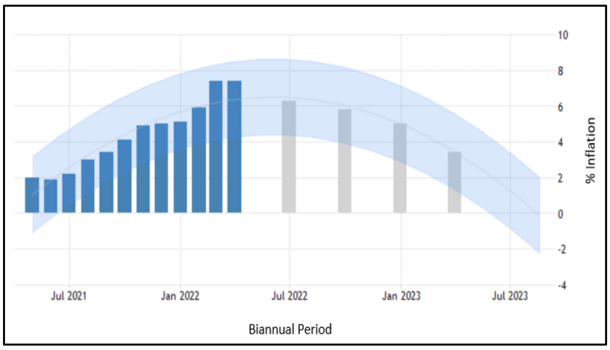


Figure 24: % Euro Area Inflation Chart from Eurostat

Considering the figure 23 and the figure 24, we can expect that the inflation rate in the Euro Area will decrease and will situate around 6.30% by the end of this quarter. Lower highs are forecasted in both charts when considering the following months, meaning a return of the annual inflation rate to its "normal" values. Additionally, it is expected to trend around 2.20% in 2023 and 2.00% in 2024.

According to a survey of professional forecasters carried out by the European Central Bank, the inflation forecast does not present a wide difference with the previous one. Inflation may stand at 6.0%, 2.4% and 1.9% for 2022, 2023 and 2024 respectively. Considering the near-term analysis, respondents stated the war in Ukraine and the exponential increases in energy and food prices, as the main factors to revise for the 2022 and 2023 inflation forecasts.

According to Trading Economics global macro models, the Inflation Rate in the United States is forecasted to be around 7% by the end of this quarter, as we can appreciate in the following figure 25.

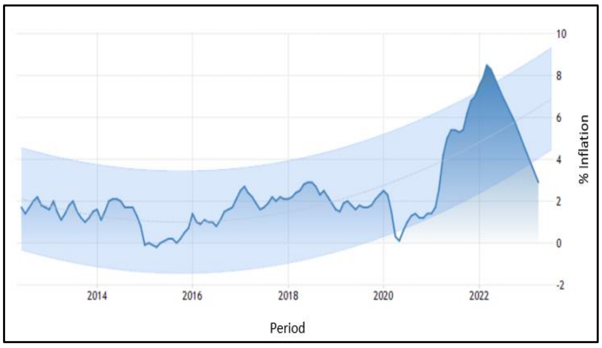


Figure 25: % US Inflation Chart from Eurostat

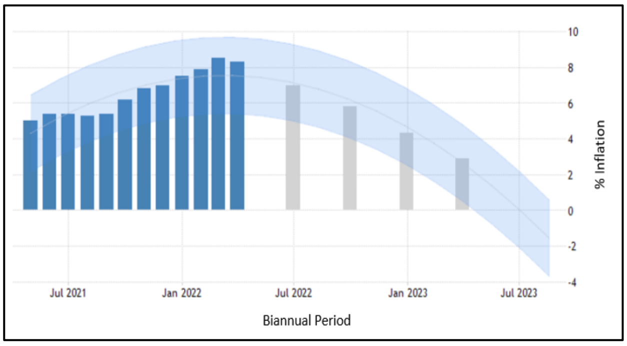


Figure 26: % US Inflation Chart from Eurostat

Going deeper into the biannual chart, we can appreciate how a decrease of the inflation rate percentage is expected for the next months, until reaching around 3% in March 202, resulting a faster decrease in comparison with the Euro Area.

Consumer Price Index (CPI)

The Consumer Price Index is considered to be an indicator in order to determine the inflation of a specific country or area. The only main consideration is that inflation is more in a larger sense, and CPI, used to calculate it, is based in a smaller sense.

When going deeper into historical data, shown in the following figure 27, we can appreciate a constant increment of the CPI, going from roughly 98 points to 116 in ten years. A fact that should be highlighted, is that an exponential growth has been registered between 2021 and 2022, meaning an increase in the average change in prices over time, which equals greater inflation.

Figure 27: Euro Area CPI Chart from Eurostat

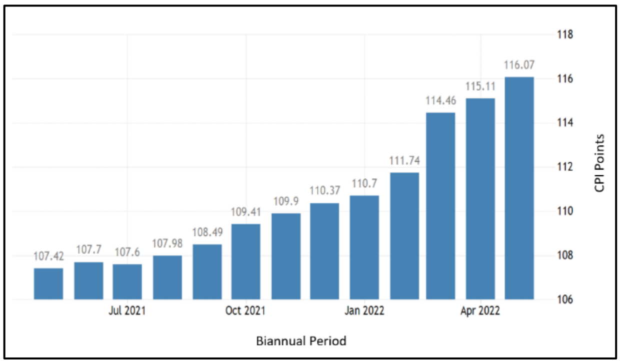


Figure 28: Euro Area CPI Chart from Eurostat

Going into more detail, as shown in the figure 28, it has been an important increment during the last year, going from 107.42 points to 116.07. This eventually leads to a higher cost when considering services and goods, resulting in an adjustment of the income in order to meet a higher cost of living.

CPI Forecast

As previously provided in the Inflation section, two graphs will be presented in order to make it more visually attractive and more understandable.

In the first chart, figure 29, we can appreciate an incremental CPI curve that does not seem to turn around after 10 years of uptrend. Additionally, it is not expected an immediate reduction of the CPI points, which is forecasted to be 114.49 point by the end of this quarter according to Trading Economics global macro models. Going further, in the long term it is expected a CPI projected to trend at the 118 zone in 2023 and 120 points in 2024.

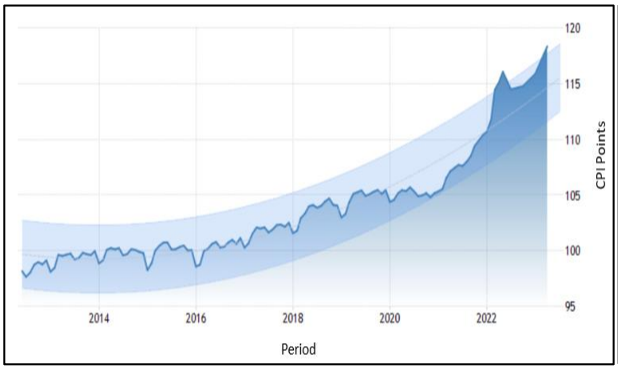


Figure 29: Euro Area CPI Forecast Chart from Eurostat

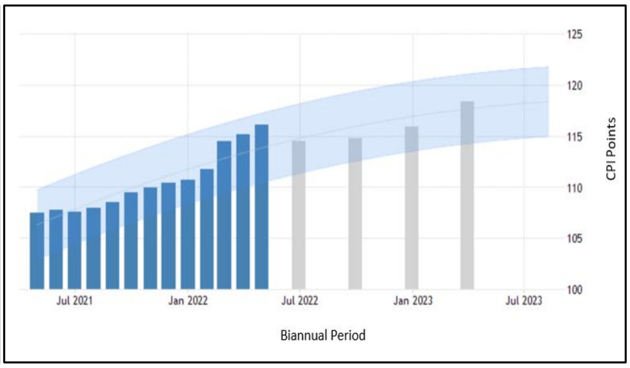


Figure 30: Euro Area CPI Forecast Chart from Eurostat

Going more into detail, considering the biannual period, figure 30, we can appreciate that the forecasted CPI tends to stabilize for a determined period of time, but another increment is presented at the beginning of 2023 which will push the CPI points to historical maximums.

Conclusions Inflation

Once having concluded with the analysis of inflation in the Euro area and United States, there are clear evidences that the US inflation percentages have reached lower values in comparison with EU, leading to a devaluation of the home currency (euro in this case), as it loses its purchasing power, because of the automatic rise in prices.

As the forecasts show a stabilisation from both sides, euro could gain strength and seen reflected with an appreciation of the euro/USD exchange rate in the next months.

9.2.3 Influence of politics

As we have previously seen, currencies' exchange rate values are easily influenceable when considering politics appointments. A clear example, is the one previously shown in the theoretical framework, where GBP is negatively affected after the Brexit Vote. Additionally, other examples could be found, such as the administration of the pandemic, which resulted in a weaken of a considerable number of currencies.

Going into the euro/USD and considering that we are analysing which could be next movement of this exchange rate, one of the most important appointments in the next following months will be the Russian and Ukraine conflict, which will have a direct impact over the analysed exchange rate.

The Russia-Ukraine war hit directly the euro, which was seen weakened in comparison with other major currencies, resulting in a drop below 1.05, considered to be one of the most important one since 2017. According to Goldman Sachs co-heads of global FX, and EM strategy, said the Wall Street giant's constructive outlook on the euro was now off the table as long as military conflict continues.

Although the crisis, the U.S. dollar has been considered as the currency of choice which allowed the currency to appreciate against other major currencies. Additionally, lots of investors have swiped into the United States dollar after the fear and strategist's concern about the surging gas and energy prices in Europe, which would lead to a lower economic growth as expected initially before the conflict.

Conclusions of politics' influence

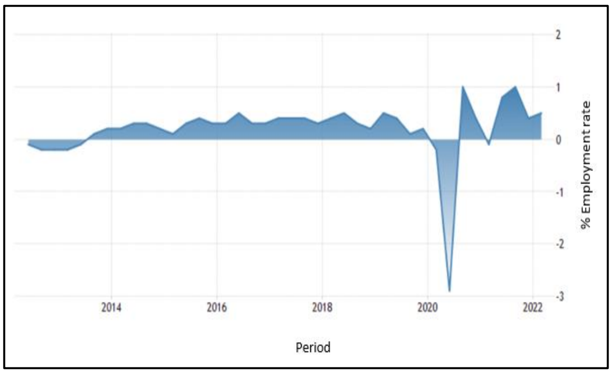
The conflict between Russia and Ukraine has directly impacted over the euro/USD exchange rate, resulting in a strengthen of USD, and a weaken of euro since its initials. Considering the global inflationary pressure in the middle of the rise in energy and food prices and disrupted supply chain after the coronavirus pandemic, has led the strategists and investors to low the Europe economic growth expectations. Thus, could be seen negatively for the short-term future of euro.

Once all having said, the future of euro/USD, considering the influence of politics, can't be accurately forecasted because of the instability of the conflict. Therefore, this will depend on the future control of Europe over the war and its duration.

9.2.4 Employment rates

As previously pointed in the theoretical framework, the employment rate represents the total number of paid workers of any business. This will have a direct impact over the home currency because of being a determinant indicator of how the economy of a country is running.

In the following graphs, the historical Euro area employment rates will be presented, allowing us to understand better the information further explained.



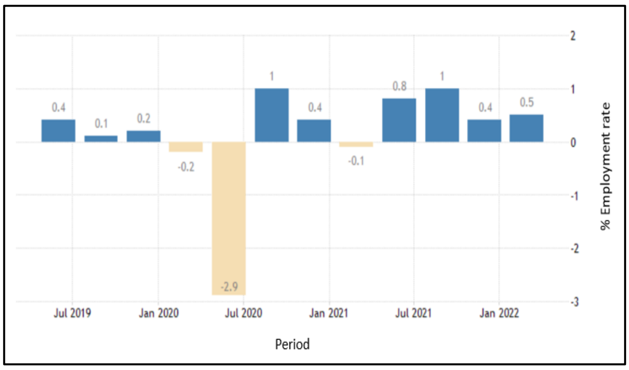


Figure 31: Euro Area Employment Rate Chart from Eurostat

Figure 32: Euro Area Employment Rate Chart from Eurostat

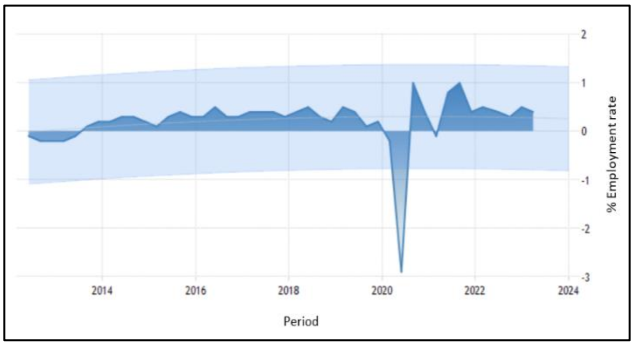
In the figure 31, considering a 10-year time frame, we can appreciate that the Euro Area Employment Rate change has been always between -0.3% and 0.5%. We have to highlight that a more sharpened chart is presented during the last two years, when the employment rate exponentially decreased until -2.9%, mainly driven by the covid pandemic.

After this unexpected and important drop in percentage points, it rapidly started to recover, until reaching 1%. Additionally, although a further decrease of -0.1%, the employment rate can be considered to be in its "normal" levels, meaning that it is stabilizing.

Going further into a shorter time period, as shown in the figure 32, we can appreciate more or less the same information as the one previously mentioned. The greatest drop resulted in -2.9% of employment, but followed with further increments of 1%, 0.8% and 1% respectively, which balanced the drop.

Employment rate forecast (EU vs US)

As previously presented in the Euro area historical data, two graphs will be provided. In this case a comparison between Europe and United States will be considered in order to clarify in which way this macroeconomic factor could affect the euro/USD exchange rate.



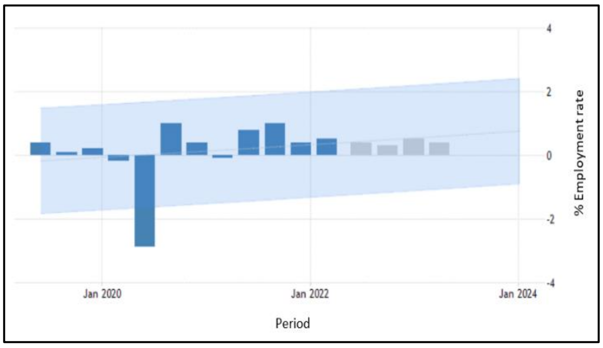


Figure 33: EU Employment Rate Change Chart from Eurostat

Figure 34: EU Employment Rate Change Chart from Eurostat

In the long-term chart (figure 33), as well in the more detailed one (figure 34), we can appreciate that the Employment Rate change will not be as sharpened as it has been since 2020. Therefore, it is expected to stand between 0.2% and 0.5% of increment. Thus, will lead to a stabilization of the market and a further constant increment.

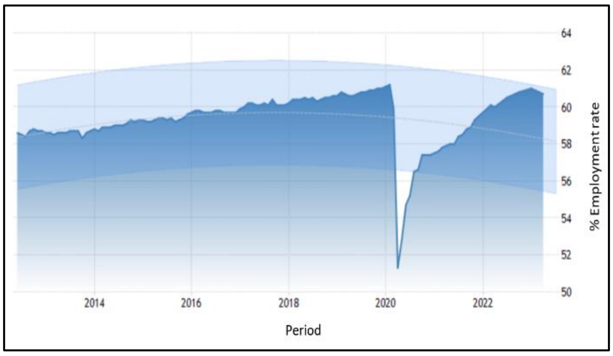


Figure 35: US Employment Rate Forecast Chart from Eurostat

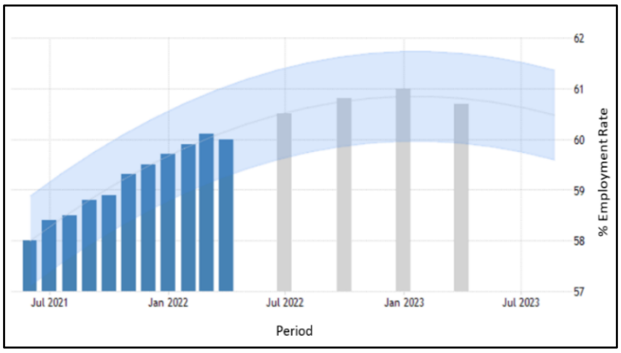


Figure 36: US Employment Rate Forecast Chart from Eurostat

When considering the US Employment forecasted chart, de data is gathered in a different manner. As we can appreciate, they do not show the change of employment rate but it shows the number of people who have a job as a percentage of the working age population. Once having stated the way that has been gathered the data presented, we will carry out the analysis considering the change in percentages in order to go in parallel with the Euro Area forecasted data.

In the long-term chart (figure 35), we can appreciate that a constant growth was established until the exponential drop of around 11%, mainly driven by the covid pandemic. After an unstable market performance, the US employment rate took more than two years to return to its "normal" percentages.

Going further into detail, in the figure 36, we can appreciate that a constant increment of around 0.2% is expected for the next months until a reverse change in March 2023. The curve shape shows that a possible reverse trend could happen, resulting in a further decrement of the employment rate that the one established in the graph.

Conclusions Employment Rate

The employment rate for the Euro area is expected to increment in the next months and, even until 2024, resulting a constant change percentage above 0%. On the other, although the employment rate for the US is expected to experience a constant increment for the next two months, when looking further, we can appreciate that a decrement is next to the corner, meaning that a reverse tendence will be likely to happen.

After having extracted the data, we can state that, if the expected situations of employment rate percentages, are successfully fulfilled, euro could gain strength again USD, resulting in an appreciation of the euro/USD exchange rate.

9.2.5 GDP & Economic Growth

For this part, the Gross Domestic Product (GDP) and the economic growth will be considered together because of its direct influence over the euro/USD exchange rate. As the previous points, two graphs will be provided, one with a longer time frame than the other.

To remind, GDP is considered a measure of all services/good produced during a specific period of time.

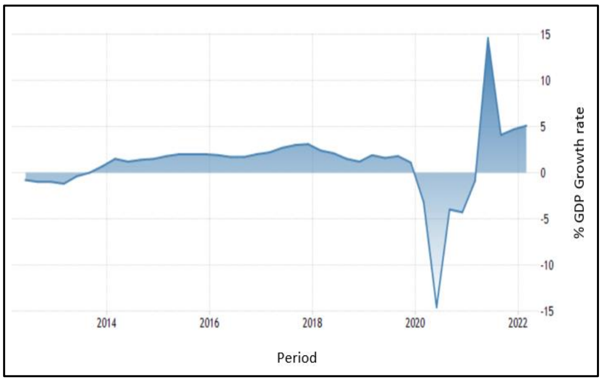


Figure 37: EU % GDP Growth Rate Chart from Eurostat

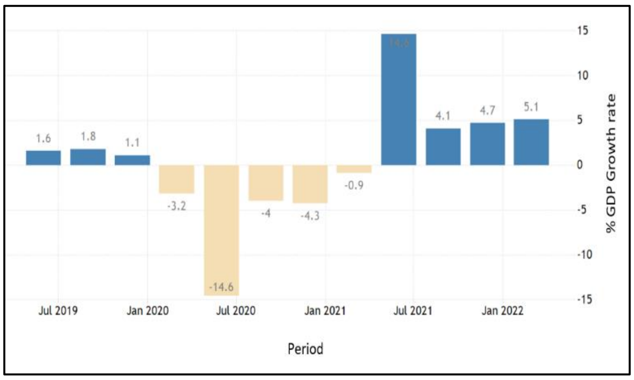


Figure 38: EU % GDP Growth Rate Chart from Eurostat

Taking a look into the long-term GDP growth rate chart, figure 37, we can clearly appreciate that from 2013 until 2020 the GDP growth rate was fluctuating between -2% and 3.5%, which was considered a normal change for the stability of the market in that moment. Once reaching 2020, as other macroeconomic factors, the changes in GDP experience an extreme decrement of 14.6%, which meant more than 4 times the values seen in the previous ten years, mainly driven by the consequences of covid. After the decrement, a radical change in the trend took place, leading to an important increment of 14.6% which supposed a return to previous values.

Going further into detail, in the figure 38, we can appreciate the different variations of the GDP. As pointed previously, we could highlight the impressive decrement of 14.6% and the increment of 14.6% in just one year. Additionally, we can see how a constant growth after July 2021 took place, with values of 4.1%, 4.7% and 5.1%, respectively.

Forecast GDP Growth Rate (EU vs US)

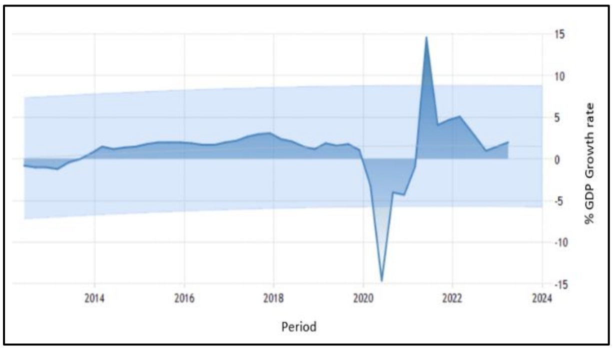


Figure 39: EU % GDP Growth Forecast Chart from Eurostat

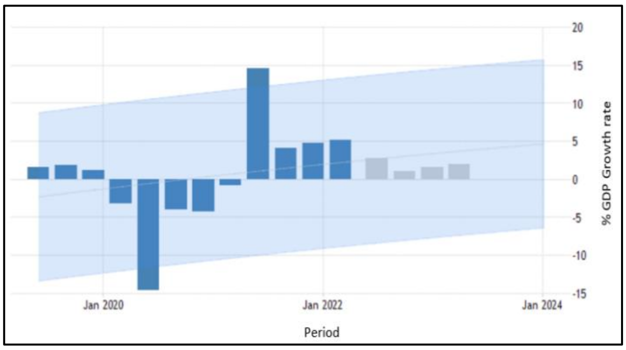


Figure 40: EU % GDP Growth Forecast Chart from Eurostat

As we can appreciate in both Euro Area %GDP Growth forecast charts, figure 39 and 40, it is expected a continuous increment that will vary from 1% to 3%. This is a clear sign that the economy is stabilizing and is going in the right direction after a period of fear and instability with a presented high volatility, mainly driven by the covid pandemic.

Going further into detail, it is forecasted the higher increment of the next months to reach 3%, resulting in a 2% less than the previous period. Additionally, the curve in directed upward, which seems to be beneficial due to it can determine the change trend for the next years.

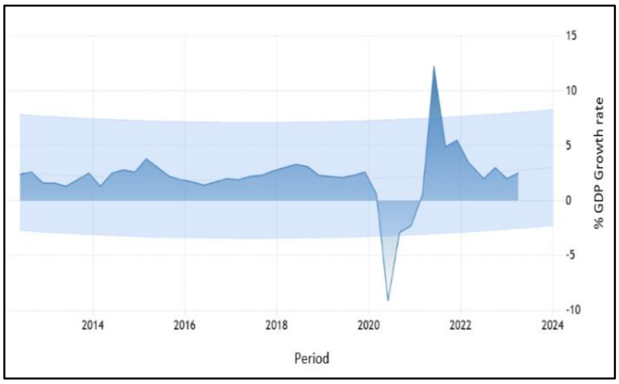


Figure 41: US % GDP Growth Forecast Chart from Eurostat

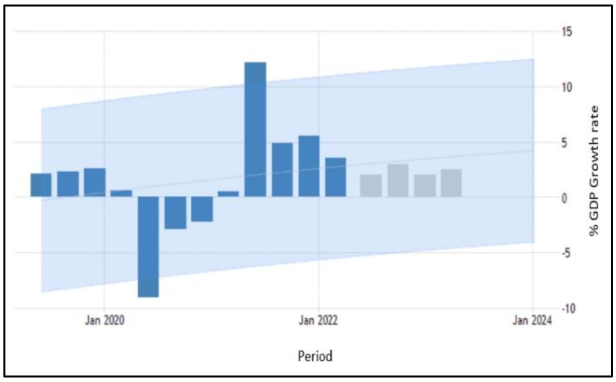


Figure 42: US % GDP Growth Forecast Chart from Eurostat

Looking forward in the US economy, we can appreciate, in the figure 41, that presents a similar picture as the Euro area' GDP. It is also presented a period with high change percentages, resulting in an important decrement followed by an exponential increment of the GDP growth rate, which suppose a stabilization with the previous established values.

Going further into detail, the picture is similar as the Euro area, with the difference that the changes can be presented with higher variations that could go from 0.2 to 0.5%, not considered extremely important. Additionally, it is expected a continuous growth for the next months, without registering percentages below 0%.

Conclusions GDP Growth Rate

As pointed previously, both markets present a stabilization of the GDP growth rate, leaving behind periods of high instability and fear, mainly driven by the pandemic situation. Thus, the economy of the Euro area and United States, seems to go on the right direction without being much affected by the conflict between Russia and Ukraine.

After all, as both markets are expected to go on the same direction and present a similar picture, we expect it to have a highly beneficial impact for the economy, although not having a decisive impact over the euro/USD exchange rate.

9.2.6 Purchasing Manager's Index (PMI)

In order to carry out the analysis of the Purchasing Manager's Index, the same structure as the previous points. A general historic data chart will be privided followed by the forecaset chart which will allow us to interpret its effect over the euro/USD exchange rate.

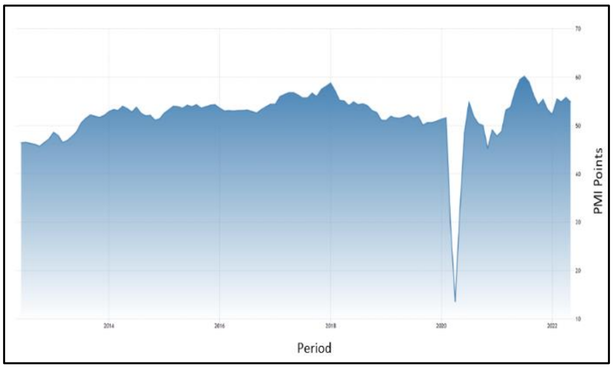


Figure 43: Euro Area PMI Chart from Eurostat

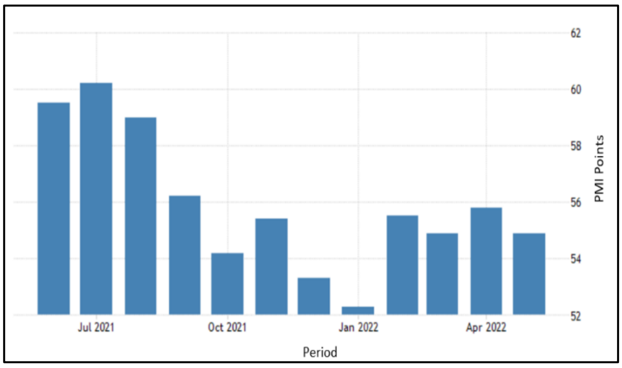


Figure 44: Euro Area PMI Chart from Eurostat

As we can appreciate in the Figure 43, the chart follows a similar pattern as other indicators. The Purchase Manager's index was standing between 47 and 55 points, until the exponential decrement in 2020 because of the covid pandemic, which reached the 12 points, considered one of the historic minimums ever registered. After it, the PMI started to return to its normal points.

Going further into detail, in the figure 44, we can state that a decrement form July 2021 has been presented, going from 61 point to 52.5 in January 2022. Moreover, the PMI fell to 54.9 in May of 2022 in comparison with the previous month, a lower value than the market forecasted. Although this decrement, it is still pointed to a considerable growth in the private sector activity.

The growth from January of 2022, was led by the service sector, which passed from 56.3 to 57.7 points. Additionally, the reopening of certain activities, the rising tourism demand, and the general reopening of the economy after the restrictions imposed because of the Omicron, was fundamental to recover its normal values.

Forecast PMI (EU vs US)

Considering the PMI expectations of the Euro area, we can appreciate that radical changes will not be presented in the following months, meaning that the market will recover its considered normal stabilization.

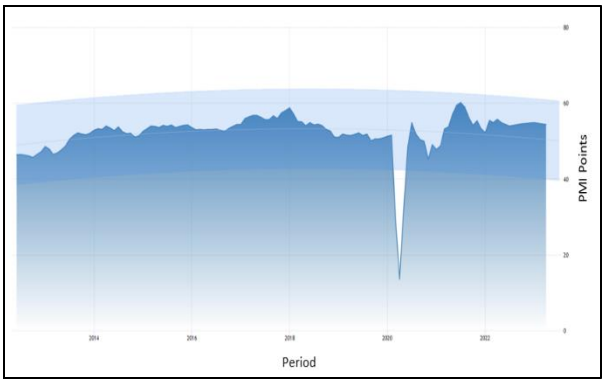


Figure 45: Euro Area PMI Forecast Chart from Eurostat

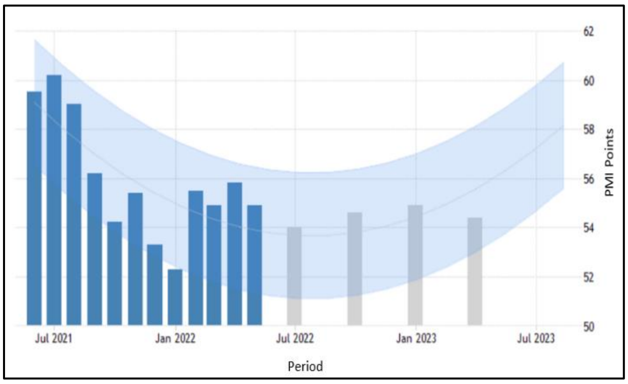


Figure 46: Euro Area PMI Forecast Chart from Eurostat

Taking a look in the figure 45, we can see that the forecasted PMI is mostly flat without changing, resulting values to stand between 53.9 and 55. Additionally, going further into detail, in the figure 46, we can state an increase in points until January 2023, followed by a smooth decline standing over 54.

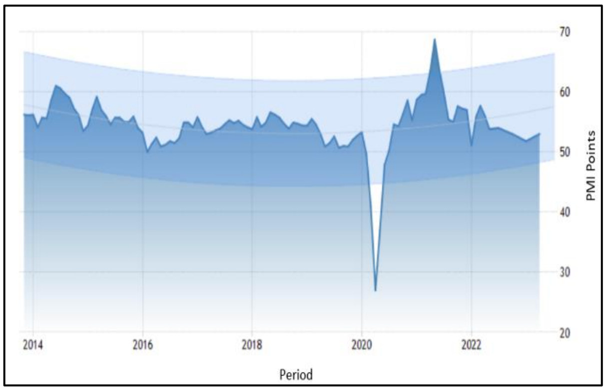


Figure 47: US PMI Forecast Chart from Eurostat

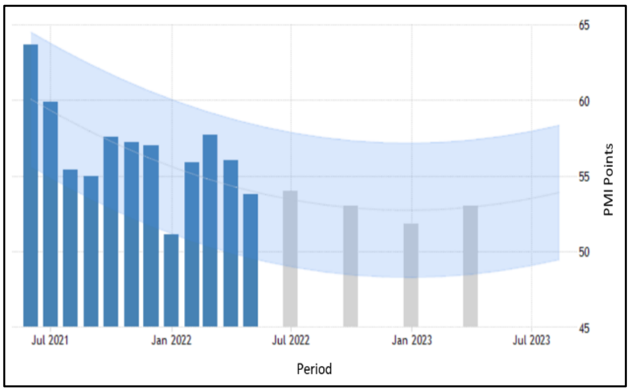


Figure 48: US PMI Forecast Chart from Eurostat

Completely different from the Euro area PMI's forecast, the US presents an initial decrease on points going from 54 in July 2022 to 53 in January 2023. After this, it is considered an increment on points, which will stand it at roughly 54.

Conclusions Purchase Manager's Index

Based on this specific macroeconomic factor analysis, the Euro area presents a PMI's increment on points from July 2022 to July 2023, resulting in a strengthen of euro in comparison with its pair currency, USD. On the other hand, the US PMI's forecast presents a totally different picture, as a decrement is expected until reaching 53 points.

After that being said, we would expect a strengthen of euro against United Sates dollar for at least from July 2022 until July 2023. Therefore, an appreciation of euro/USD exchange rate would be presented, although we have to consider that after July 2023, the picture is changing for both economies, which also would suppose a possible effect over the pair currency.

9.2.7 General conclusion fundamental analysis

Fundamental analysis has resulted highly beneficial in order to understand how the US and Euro Area economy has been running during the last ten years. Additionally, it has given a general picture in order to determine which are the expectations of those analysed macroeconomic factors in the next year. In the following conclusions, all the factors will be accurately considered.

Considering the European Central bank, does not seem to have an important influence over the EUR/USD exchange rate for the following year, because although some has stated that an intervention should be required, it would be an extreme rare event, no seen from 2000. Additionally, the interests' rates show a possible appreciation of EUR/USD exchange rate, because of the expected higher increment of interest rates carried out by the Fed.

Going through the inflation, one of the most important factors, it is expected a stabilisation from both economies, EU and US, which could lead to a further appreciation of the analysed exchange rate, because of its previous instability and volatility presented in the Euro area and its return to normal values. Although the possible appreciation, this would not be extremely considerable because in both economies is expected lower percentages.

Russian and Ukraine conflict has been extremely influenceable over the EUR/USD exchange rate, resulting in a weaken of euro against other major currencies. Because of the uncertainty of the duration period and unexpected future appointment, from a personal and technical views, can't define which will be the effect over the euro.

Another macroeconomic factor that doesn't clearly provide which could be the next movement of the exchange rate, is the Gross Domestic Product, known as GDP. It is expected, that both economies, will present a beneficial general picture of the GDP, as will further increment for the following year. This, will be highly beneficial for the economic growth, although not determinant for the exchange rate, for the moment as they present similar increments.

The last two macroeconomic analysed factors, the employment rate and the Purchase Manager's Index, present an appreciation of EUR/USD. The forecasted values show a strengthen in euro as it is expected an increment on points considering the PMI, and a positive increment of employment rate change in the Euro area.

In conclusion, although some indicators do not provide a clear image of how will the exchange rate fluctuate during the following the year, others have shown a clear strengthen of euro against one of its major competitors, United States dollar.

10. SURVEY

Although a survey is not extremely relevant for the final project conclusions, it gives us an idea about different perspectives within the market. In order to carry out the survey in the most appropriate way, the considered most important conclusions extracted from both analyses have been presented to the trading team of Morgan Stanley, an American multinational investment management and financial services company, distributed through a personal contact actually employed within the firm. As all the answers provided come from expertise employees with a professional career directly related to investments, a high level of reliability is presented as well as valuable interpretations.

The survey structure consisted in just one question in order to verify that everyone answers according their own critical thinking. The title was defined as "According to the main conclusions previously mentioned, indicate from 1 to 5 how much do you agree with them, considering the provided actual chart of the EUR/USD exchange rate". Once having them presented some conclusions extracted from both analyses, the obtained results were the ones presented in the following column chart.

The scale was thought to be structured in the following terms:

1. Totally disagree
2. Disagree
3. Neutral
4. Agree
5. Totally agree

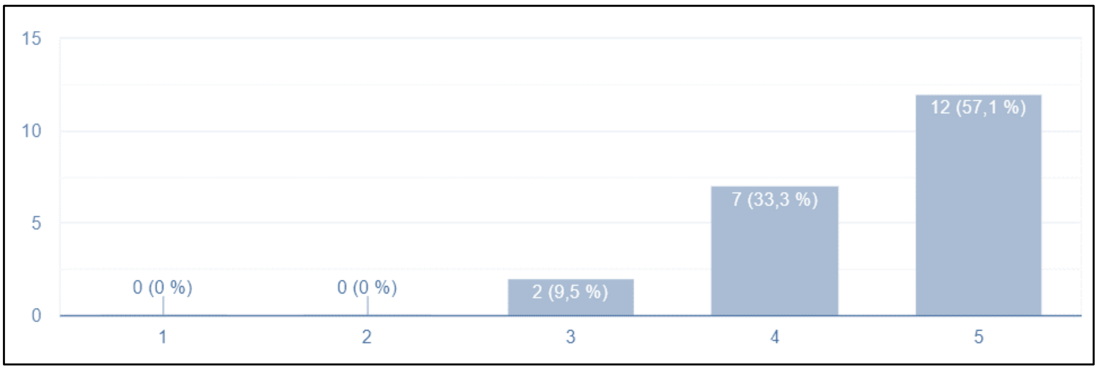


Figure 49: US PMI Forecast Chart from Eurostat

As we can appreciate in the figure 49, none of the employees who answered the survey totally disagree with the conclusions and the chart provided, while a 9.5% considered to be positioned in the intermedium of the scale. Going through it, we can state that a 33,3% and 57,1% of the answers were distributed between "Agree" and "Totally agree" respectively, which gives more reliability to the final conclusions.

This result concludes and verify that workers from the trading department in Morgan Stanley agree in the majority of the points or totally agree with the established conclusions and the previous fundamental and technical analysis carried out.

11. DISCUSSION

The primary purpose of this study was to analyse and forecast EUR/USD, considered to be one of the most traded pair currencies. Once having carried out the research, some interesting and relevant points from the literature framework should be taken into consideration together with the analysis and forecast.

The fundamental analysis, has provided us, that during period of instability and great volatility, presenting an accurate forecast is much difficult that when there's an established and "calm" market. Therefore, in contradiction of what Warren Buffet states in the CNBC interview, about just considering the fundamental analysis, I have experienced that more information can be extracted by considering both, fundamental and technical. Thus, allows us to interpret the information provided in the charts, by considering several indicators, and be aware of what is actually happening in the currency's home country. Additionally, Jenni L. Bettman; Stephen J. Sault; Emma L. Schultz (2009), after carrying out a study of both analyses, confirm that a greater profitability is presented with the application of both together.

Another point to consider, is in contradiction with the previous study carried out by Gaucan, V. (2011), exposing that Fibonacci Retracement is useful when identifying target prices, stop losses and strategic points, considering more greater time frames rather than short ones. During the analysis, the application of this indicator was not carried out because the structure of the graph was not considered appropriate neither determinant for the analysis. Additionally, as analyzing in a week timeframe, the patterns are formed in a longer period in comparison with short time periods. Therefore, from my technical point of view, the application of Fibonacci Retracement is easier when considering lower timeframes, as more opportunities are presented.

Professional summary

An analysis of the EUR/USD has been carried out through the consideration of technical and fundamental analysis. Technical analysis shows a possible rebound within 1.0600 and 1.0400 as being established an important support level. Bollinger bands and RSI show a possible buying sign in a near future, while Parabolic SAR is not considered highly determinant for its forecast. Fundamental analysis shows again a possible strengthen of euro against the major currencies, although some macroeconomic factors, such as the influence of politics, show uncertainty because of the unexpected Russian and Ukraine conflict. Therefore, after being considered both analyses, the appreciation of euro will not take a long time to become a reality.

Hypothesis

Hypothesis have been clearly answered during the project and further highlighted in the final project results. Going further into detail, we have appreciated, with the development of the technical and fundamental analysis, that an expected appreciation of euro will take place in a near future, always, considering the established support level. Although some macroeconomic factors have shown uncertainty when defining the further movement of EUR/USD exchange rate, such as the influence of politics, the others have shown a clear strengthen of euro against United States dollar.

Going through the US and EU economies, based on the information extracted and expectations from the fundamental analysis, both are showing an improvement in comparison with the last two years. In some macroeconomic factors, a major development is declined to the Euro area side, while others show a similar picture for both economies. Therefore, we could state that, based on indicators, Euro area economy will be healthier in comparison with the last two years and will present a faster improvement in comparison with the United States one.

Limitations

During the development of the project, a main limitation has been found, which is the limited access to reliable data. Although some recognized financial entities can provide reliable information with the purpose of promoting transparency in the market, usually, the reality is not as it should be. The majority of them, only present basic information without diving into important details which obligates you to look for information in other sources with not such degree of reliability. This limitation has supposed a challenge, especially, when carrying out the fundamental analysis, because some data provided was not as accurate as expected. Although this statement, all the information stated, has been validated or extracted from recognised entities.

Further research

Interesting research questions for future research may be constructed from the project carried out. Fundamental analysis, has provided us some uncertainties about the influence of politics over the forex market, especially for the instability because of the duration period and unexpected appointments that can happen without prior announcement. In this particular case, it will be important that future research investigate the level of influence of the Ukraine and Russian conflict over the forex market by considering the major pair currencies, as it has not shown a clear positioning within the EUR/USD expected exchange rate.

Another recommended future research may be drawn from the provided Euro area economic information. Further analysis is required to prove initials findings about the Euro area economic growth, examining it strategically and diving into other points of interest which can provide realistic and accurate results.

12. FINAL PROJECT RESULTS

The Foreign exchange market has constantly been affected by a wide range of factors and unexpected situations, which has led to periods of instability and uncertainty. Two main examples could be found considering the last two years - (1) Covid pandemic led to an establishment of important restrictions and the immediate stop of all the economic activity during the duration of the total lockdown. This, resulted highly detrimental for the countries economy's health and a lower economic growth expectation. – (2) Unexpected Russian and Ukraine conflict, has led to a weaken of euro in comparison with the major currencies and, specifically, the United States dollar. Because of the uncertainty and the fear presented within the Euro area home currency, the euro was depreciated until reaching minimums not seen since 2015. Those, are clear examples of how any unexpected situation can directly affect the EUR/USD exchange rate, and indirectly, our personal purchasing power and financial health. Therefore, the main purpose of this research is to analyse and forecast the EUR/USD exchange rate within one year, allowing us to know how will the Euro area economy develop in the next months, and compare it with one of its major competitors, United States.

In order to carry out the research, two analyses have been considered for the accurate development, the fundamental and the technical ones. As defined by Mokrička, P., & Hockicko, B. M (2014), technical analysis is a technique and discipline employed in order to evaluate and study the past movements of a chart for the purpose of identifying trends and patterns that could repeat in a future. On the other hand, fundamental analysis, is considered to be the process of studying and analyzing the impact of those economic, political and social factor that could affect the relative value of a currency.

Diving into the results, the technical analysis provides us an expected appreciation of euro in the following months. An important support level is about to take action with the further fluctuations of EUR/USD exchange rate, resulting in a rebound between the values 1.0600 and 1.0400. Additionally, other indicators, such as MACD, Bollinger bands and the relative strength index (RSI), also show a possible long position in benefit of euro's currency in comparison with United States dollar. Although this statement, the indicator Parabolic SAR, analyzed on 15/05/2022, does not expect an immediate reverse movement from the exchange rate, but we should consider that the chart doesn't present any significant determined pattern for its applications, which means that a sign could appear when a presented established rebound happened.

The fundamental analysis provides a similar conclusion as the expected in the technical analysis, an appreciation of euro is likely to happen in the following months. For the moment, a European central bank direct intervention over the exchange rate will not take place, as it would be considered an extreme rare event, not seen since 2000. Although not intervening directly, there would be an increment of interest rates, considered to be in a minor proportion as the ones expected by the Fed, which would result beneficial for the euro investors. Additionally, other macroeconomic factors, such as the inflation and the PMI, present a picture that results highly beneficial for the EUR/USD exchange rate. Considering the GDP, it doesn't clearly provide which could be the next movement as in both economies are presented a similar picture and expectations. Finally, one factor that could be relevant and have a direct influence, is the Russia and Ukraine factor, which can't be determinant when considering further movements for the moment, because of the possible unexpected next appointments and the period of duration.

In conclusion, a further appreciation of the EUR/USD exchange rate is expected to happen in the following months, always considering the established support level previously mentioned. This would also suppose a healthier EU economy in comparison with other major economic forces, as almost everything, is returning into its normal values presented before the Covid pandemic and the recent unexpected conflict between Russia and Ukraine. Results were supported by the majority of the survey's respondents.

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