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Bachelor Thesis

Evaluation of precious metals investment

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Evaluation of precious metals investment

Objectives of thesis

The bachelor thesis deals with investing in the precious metals. The aim is an evaluation of the perspective in this market and the appropriat assessment of this form of investment from the view of risk, liquidity and profitability based on data from last years and current developement on the market.

Methodology

In first, theoretical part of the thesis will be used mainly indikative research and qualitative data analysis . In the second, practical part, will be used Continuous research, quantitative data analysis, comparsion and technical analysis

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Declaration

I declare that I have worked on my bachelor thesis titled " Evaluation of precious metals investment" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 13.3.2018 ____________________________

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Vyhodnocení investování do drahých kovů

Souhrn

Bakalářská práce se zabývá investováním do drahých kovů, konkrétně zlata a stříbra. Cílem je zhodnocení perspektivy v tomto trhu a příslušných posouzení této formy investic z pohledu rizika, likvidity a ziskovosti, historického vývoje a současného vývoje na trhu.

Klíčová slova: Investice, drahé kovy, zlato, stříbro

Evaluation of precious metals investments

Summary

This bachelor thesis explores different aspects of the investment in precious metals. More specifically, the investment in gold and silver. The aim of this work is to evaluate the market and make an assessment considering varied factors, such as, risk, liquidity and profitability. Such assessment is based on historical data and current development of the market.

Keywords: Investments, precious metals, gold, silver

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1. Introduction

For thousands of years commodities have been used as currencies in trading. In former times precious metals, such as gold, has played an important role in the international monetary system. Gold coins were first adopted as currency on the order of King Croesus of Lydia (nowadays this region belongs to Turkey), around 550 BC. In addition, it is important to notice that, gold and silver coins circulated as currency in many countries before the introduction of paper money.

For extended periods of time, precious metals were adopted as symbol of wealth and power. However, its importance gradually decreased with the adoption of paper banknotes as currencies in the international monetary system. In addition, in 1971, due to the Bretton Woods agreement, gold stopped to have the function of currency coverage. As a result, central banks decrease the amount precious metals from their assets. However, in recent years, such approach changed, and nowadays gold, silver and platinum are increasingly being used as an asset for investment. Not only, for institutional investors but also for small investors.

2. Goals and Methodology

2.1 Goals

In order to better investigate the usage of precious metals as and asset for investment, this thesis analyzes the investment on selected precious metals, namely gold and silver. More specifically, this thesis covers the usage of such metals as an investment instrument to outline their investment potential with the aim of provide upfront recommendations may aid smaller investors or investors that are looking forward to diversifying their portfolios.

2.2 Methodology

In order to achieve the above mentioned objectives, the methods of description, analysis, synthesis, comparison and deduction, will be used

First part of the thesis will be dealing with *commodities* and investing options. Also during that we will briefly touch which method of investing is more suitable for which kind off investor. There will be used mainly description method, comparsion and synthesis.

In the second chapter, *Gold & Silver* there will be taken look at current situation in the precious metals markets using qualitative and quantitative analysis off the state of utilization, new supplies, demand and development trends in the gold and silver market. For the description of the development markets in recent years and their current situation, we will use the description method.

The last chapter *precious metals technical analysis* will be focus on charts of historical price movement, both short and long term, gathered from trading activity and will use various analytical tools such as Moving averages, StochRSI and Bollinder Bands. Data obtained from these indicators will be described, analysed and used to forecast future price changes.

In the *Overall conclusion* and *Main investment recommendations* will be used synthesis of information gathered in the chapters above. Based on these data will be conclude if the precious metals are worth investment, for which kind of investors and also will be given an investment recommendation.

3 Theoretical Part

(Commodities as an Investment Instrument)

The main motivation for the investment in commodities is the appreciation of free funds. When using commodities, investors operate on the financial markets through investment instruments.

3.1 Investment instruments

Investment instruments can be understood as an asset that gives the investor some entitlement to future income, i.e., dividends, coupon payments, foreign exchange gains and interests. Such instruments can be classified into two groups: **financial instruments** and **real instruments** [1]. Such classification takes into account the form of instruments their frequency and movement of their courses. However, it is important to notice that, depending on the type of investment, some assets can belong to change their classification. This is the case of precious metals as it will be discussed as follows:

3.1.1 Financial instruments

The instruments in this group usually do not have a tangible form, such as, diverse types of securities, financial derivatives, insurance contracts, term or savings accounts, etc. Many economists, include precious metals in this group. This is because, precious metals contain considerable value in small volumes. In addition, their holdings do not bring ordinary returns, but they can speculate on the future rise in market prices. On the other hand, due to their characteristics and the possibilities of their utilization, precious metals are classified among real instruments. Due to its exceptional properties and main type of investment, precious metals will be classified in this work as real assets.

3.1.2 Real Instruments

Real assets are instruments that have a material form. Specific examples include, precious stones, artistic collections, antiques, real estate or mineral resources. According to Rejnuš[1], real instruments can be sub-divided into direct business, real estate purchase, buying movable items and buying commodities. These instruments, unlike financial instruments, often do not represent a direct monetary value. As strange as such consideration may look, the ownership of rare paintings, historical objects and artistic masterpieces do not necessarily lead to a direct profit over time.

Furthermore, another elemental difference of real instruments and financial instruments is that some real assets do not have their value dramatically affected by market changes, such as market crisis and hyperinflation[2]. It is important to notice that, hyperinflation is an economic phenomenon that occurs when a country experiences very high and sharp accelerating rates of inflation. Such market behavior leads to the rapidly erosion of the real value of the local currency. As a result, the population to minimize their holdings of local money.

In such turbulent times, the importance of real assets increases, this is because they can be used as a form of payment. In this case the payment using real values its beneficial for the owner due to the fact that they keep their true value whereas the local currency has large fluctuations.

In addition, another difference between financial and real instruments is the correlation between the evolution of an asset yields and its inflation. Real assets enable the investor to provide an efficient protection against inflation depreciation. With increase of the inflation, the yield rate of most of the real assets tends to grow, and it is positively correlated with inflation.[3] As a result, this type of investment is very attractive and in times of economic and political turmoil. However, the main disadvantage of real assets is their high transaction costs, low liquidity and currency risk.

It is important to bear in mind that nowadays, the most common of form of trade for commodities is to exchange commodities into USD. Therefore, it is important to monitor the relative changes between CZK and USD.

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[1] REJNUŠ, Oldřich. *Cenné papíry a burzy*. 2., přeprac. vyd. Brno: Akademické nakladatelství CERM, 2013. ISBN 978-80-214-4673-1.

[2] VESELÁ, J. *Investování na kapitálových trzích.*. 1. vydání. Praha: ASPI a.s., 2007, 704s ISBN 978-80-7357-297-6str 258

[3] VESELÁ, J. *Investování na kapitálových trzích.*. 1. vydání. Praha: ASPI a.s., 2007, 704s ISBN 978-80-7357-297-6str 258

3.2 Commodities

Commodities can be understood as substitutable goods that can be standardized and can therefore be traded on organized markets, in this case on commodity exchanges, even without their physical presence.

3.2.1 Diversification of commodities

Commodities are a very large group. In the literature, there is more ways of sorting, but often not all commodities are included. For example, there is a fair division of commodities according to Rogers[4], which is based on its international commodity index. Rogers divides commodities into cereals and oilseeds (corn, wheat, oilseed), meat (beef, pork), agricultural commodities (coffee, sugar, cotton), energy (natural gas, electricity), precious metals (gold, silver, platinum). As this work is directed to small investors the distribution of agricultural commodities, such as, energy, industrial metals and precious metals will be taken as the main scope.

3.2.2 Commodity exchanges and participants in commodity markets

Commodity exchanges are part of the capital market and have arisen due to the increase in the volume of futures contracts purchased and the need to have a central place where these transactions will happen. There are now many commodity exchanges in the world. Their main purpose is to provide a highly reputable and reliable environment for the execution and settlement of trades, as well as supervise business practices and guarantee ongoing business. The most famous commodity exchanges are in the US, and among the major ones are: CME (Chicago Mercantile Exchange), NYMEX (New York Mercantile Exchange), NYBOT (New York Board of Trade). In the Czech Republic, it is the Commodity Exchange Prague.

Investors are entering the commodity market for various reasons. Some want to secure against price fluctuations, others try to earn more on price fluctuations. Their success depends on their ability to properly analyze the market situation and draw conclusions from that.

[4] Rogers Jim Hot Commodities: How Anyone Can Invest Profitably in the World's Best Market
, Random House Trade Paperbacks; Reprint edition (27 March 2007)

Trading entities in commodity markets can be divided into two groups, namely commercial entities and speculators.

1) Commercial entities - hedgers - use commodity markets to secure their production or to buy physical commodities. These entities buy / sell commodities for their actual physical delivery. [5]The reinsurers are looking for sales for their goods or they want to buy it in advance. They often trade on futures to hedge against fluctuations in commodity prices.

2) Speculators (traders) earn on price fluctuations. Their immediate motivation to trade relies on estimates, analyzes, and predictions of likely market developments in the future. Speculators, unlike reinsurers, maintain open positions usually for a very short period of time, as they often trade in borrowed money. For the speculators' pros, can be assumed that the market acts as a counterweight to hedging trades and secures market liquidity. Speculators can be further divided into large speculators and small speculators. Large speculators include bank professionals, funders, etc. These entities speculate on price movements with significantly higher capital than ordinary small speculators traded in a small number of contracts. The small speculators group includes all persons who do not fit into the previous two groups (eg small investors)[6].

Determining how the price will develop is very difficult. Often it depends on intuition, but mainly on the correct analysis of available information. However, each investor may have a different view of the same market and therefore choose different tactics.

They can be grouped into two groups according to the criteria they prefer for market analysis. The first group is fundamental traders who focus on a few commodities that they seek to gain in depth knowledge. They keep track of news, weather, stock, etc., and estimate the future price developments from this information. This is a very demanding way of estimating market development. For this reason, most small merchants are based on graph studies and are called technical dealers. These traders do not need detailed commodity information based on the current price development chart[7].

They use mathematical formulas, and they are looking for different formations in charts to help them estimate further price developments. Of course, a combination of these two approaches is possible. Furthermore, the investor must decide whether to enter a short or long

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[5] NESNÍDAL, T., PODHAJSKÝ, P., *Obchodování na komoditních trzích: průvodce spekulanta*. 2.rozšířené vydání, Praha: Grada, 2006. 200s. ISBN 80-247-1851-0

[6] NESNÍDAL, T., PODHAJSKÝ, P., *Obchodování na komoditních trzích: průvodce spekulanta*. 2.rozšířené vydání, Praha: Grada, 2006. 200s. ISBN 80-247-1851-0

[7] An example will be done at the page 34

position. He chooses a short position if he thinks that the market price of the selected instrument will drop. Therefore, such a trader first sells a contract that he does not own but borrows it, for example, from another investor, with the assumption of lower prices in the future. When this happens, the contract will be re-purchased at a lower price and returned to the subject from which you borrowed it. The profit for the trader is the difference between the sale and the purchase price.

However, an investor can choose a long position. Here is the fact that the trader believes in the price of a particular contract and therefore buys it. The main objective is therefore to buy at low prices and later to sell at high to make a profit. In addition, the investor must decide whether to trade on a spot or intraday basis. Positive trader is anyone who holds their open positions (or who stays in the store) for longer than 1 day (e.g., month, year).[8] The second option is an intraday trader who carries out transactions within one day. This would not be the right choice for a small investor, primarily because of the information intensity.

3.2.3 Advantages and disadvantages of investing in commodities

Investing in real assets, especially commodities, has many advantages. The most important of these is, the real value of these assets. Their value cannot fall to zero, unlike stocks of, (for example a bankrupt company). Another reason to invest in commodities may be the fact that some commodities can also bring non-cash benefits to the owner. For example, the owner of gold bricks can show their wealth and prestige in this way, or these assets can bring simple joy of ownership (art work). The advantage of commodities is also that their value tends to grow in times of instability and uncertainty, both economic and political.

Table 1: Correlation coefficient between selected assets and inflation, 1900 - 2011

Correlation between inflation and selected asset	Correlation coefficient
Inflation and securities	-0,52
Inflation and bonds	-0,74
Inflation and gold	0,26

Source: http://www.mymoneyblog.com/

[8] Rogers Jim Hot Commodities: How Anyone Can Invest Profitably in the World's Best Market , Random House Trade Paperbacks; Reprint edition (27 March 2007) page 79

This phenomenon can be caused by the fact that if money quickly loses its value, people will not put their trust in money and will try to secure what has real value. For another advantage, can be seen that commodities allow diversification of risks in the portfolio. Investing in commodities also has its disadvantages. These include the costs of holding commodities, but also high transaction costs. These are transaction costs such as transport or currency exchange charges, or costs associated with the execution of the decision[9] another disadvantage is that commodity assets often have low liquidity and also the fact that no regular income is associated with commodity ownership. The only yield is therefore a capital return, which can only be realized at the end of the investment horizon.

3.3 Options for investments in commodities

There are currently many ways to use commodities to invest. Subsequently, these options will be introduced and, above all, this chapter will focus on their use in investing in precious metals.

3.3.1 Direct investment in commodities

Direct investment consists in the purchase of a commodity asset itself. If we deal with commodities such as oil, natural gas or grain, it is often the purchase of large volumes, with which large transaction costs and storage costs are associated. The risk is also the possibility of depreciating certain types of commodities or their low liquidity[10]. These factors are the reason why I would not recommend investing in commodities to a small investor. However, this does not involve investing in precious metals, which, on the contrary, is very convenient and unpretentious. Specifically, it may be gold or silver coins, sticks or jewelry that are easily available on the Czech market.

Such investments do not flow in the ordinary yield, but only in the capital. But they are a good means of preserving value. Precious metals can also be well used to diversify the portfolio as they reduce its overall volatility because they do not correlate too much with other assets.

Commodity derivatives

[9] http://www.businessdictionary.com/definition/transaction-cost.html

[10] VESELÁ, J., *Investování na kapitálových trzích*.1. vydání. Praha: ASPI a.s., 2007. 704s ISBN 978-80-7357-297-6; str. 602

Investors can invest in commodities other than through direct purchase. One option is commodity derivatives. These are financial instruments whose price depends on the price of the underlying asset. Commodity derivatives are associated with the purchase or sale of commodity assets such as maize, natural gas, grain or precious metals. The gain or loss of the investor that has negotiated the derivative contract depends on the spot price of the underlying asset at the time of the maturity of the derivative contract. Commodity exchanges deal with this instrument through time trades.

Investors can treat these as business contracts for which there is a longer time lag between the moment of closure and the agreed settlement date[11]. In other words, they are currently negotiating a deal with their partner, they will negotiate all the conditions including the price, and at the time of the maturity of the contract, the underlying assets will be transferred. Such a trade can have many advantages and is often closed for various reasons - collateral, speculation, arbitration.

Term contracts can be divided into unconditional trades, which consist in the fact that at the maturity date of the derivative the two parties have the obligation to fulfill the contract and the conditional transactions where the buyer can choose on the day of the realization whether the transaction will take place. Commodity derivatives include futures, forward, swap and option futures.

Futures

Financial futures represent a firm agreement between the two parties, which implies the right and, at the same time, the obligation to buy or sell a standardized amount of the underlying asset for a predetermined futures price within a standardized standard[12]. This price is derived from the price of the underlying asset. This is an unconditional trade where both parties have an obligation to conclude a contract. Commodity futures are traded on organized markets and serve both for securing raw materials and for investment and speculative purposes.

The transfer of an asset may not have the effect of an investor selling the commodity contract before maturity. It can benefit from a change in the price of the underlying asset without having to physically own the asset. It can be an advantage for a small investor who does not incur costs associated with, for example, transportation and storage. However, he must trade in a commodity that has sufficient liquidity on the market to sell the contract before maturity. For such an investor it is advisable to invest in precious metals, namely gold and silver.

[11] REJNUŠ, O., *Finanční trhy*. 3. vydání Ostrava:Key Publishing. 2011. ISBN 978-80-7418-128-3 str 446

[12] http://www.businessdictionary.com/definition/financial-futures.html

The advantage may also be that they are trading on the stock exchange. This is linked to standardization and strict stock market supervision, which can mitigate the risk of uncomfortable trading, as well as relatively high liquidity compared to off-trade. The disadvantage can be margin and leverage, which is part of the contract. The investor pays only the deposit and the rest of the contract is secured by a margin loan. As a result, the lever, which is relatively low, controls the investor with several times the volume of assets[13]. If the price of these assets rises, it means more profits for the investor, but if it falls, it will cause more leverage.

Forward

Forwards are the oldest type of futures. This is also the buyer's obligation to buy a certain amount of the underlying at a fixed price on a particular day and the seller's obligation to sell the asset on the same terms. The difference is that forward is a non-standardized deal and trades with it on over-the-counter markets[14], which is also associated with lower liquidity than futures. The advantage is that the parties can agree on any condition and price at which the deal will take place. The price is mostly based on stock prices. The downside for the investor may be the higher transaction costs associated with the sale of the contract and the need for greater knowledge and experience in trading to avoid the conclusion of inappropriate trade.

While it is possible to trade in precious metals through forwards and speculate on their future price, It is not a good opurtinity for investing to start for small investors, because it is a less liquid product and, moreover, can be an obstacle to investment. Commodity traders consider a small investor as one who is able to invest at least $ 30,000.

Swap

Swaps are financial agreements to exchange cash flows. Swaps can be based on interest rates, stock indices, foreign currency exchange rates and even commodities prices[15].. This is actually two or more forward contracts that are linked to one another. This is an unconditional contract and is mostly traded over the counter. An advantage can be the provision against price increases and the adaptation of contractual terms. The subject of the swap can be precious metals,

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[13] TOMČIAK, B., Úvod do obchodování s komoditami – 4. Díl:Finanční páka, kdo a kde obchoduje.*Investičníweb.cz*[online]. 20. 5. 2010 [cit. 2014-11-26]. Dostupné na:< http://www.investicniweb.cz/fx komodity/komodity/2010/5/20/uvod-do-obchodovani-s-komoditami-4-dil-financni-paka-kdo-kde-obchoduje/strana/2/

[14] OTC (over-the-counter) trhy umožňují obchodování cenných papírů, které nesplňují podmínky burzovních trhů. Investinganswears.com

[15] http://www.investinganswers.com/financial-dictionary/businesses-corporations/swap-1640

but it is obvious that this is a more complicated contract than the forward and futures contracts, and therefore it is not recommended this kind of trading to a small investor.

Option

Previous term contracts were absolutely unconditional, but for options (or commodity options), term trading is conditional. This is a contract that gives the option holder the right (not the obligation) to buy or sell at the agreed time the underlying asset at a predetermined price. At the same time, it is the obligation of the seller to sell or buy the asset under the same conditions[16]. It is up to the option owner to decide whether to opt for the option and the seller has to respect this decision, for which the buyer opts for the premium.

If the option holder can only apply the option on a pre-arranged day, we are talking about the European option. However, there is also the option to exercise the option within a certain time limit until the specified date, then it is an American option. Options are further divided into call option and put option.

Purchase options

If investor own a call option, he has the right to buy an asset, in our case, precious metal, but at the same time he have to pay the seller the option premium. In this position, he speculate on the rise in the price of this metal. If this happens, it is beneficial for him to exercise our option. If he sell a call option, it means that he speculate on the price drop.

Then he wait for the option owner to decide. Here is an advantage for the seller, especially the European option, that he does not have to own the asset at all. The seller, as I mentioned earlier, assumes a price drop, therefore, it issues a call option which it sells and receives an option premium for it. If the price really drops, the current owner decides not to opt, and rather precious metal will buy at the current lower price. The seller, without ever having owned this asset, is profiting from the bonus premium he has acquired.

However, if the price increased, the option owner would like to exercise the option and the seller would have to deliver the expensive metal. If he does not, he has to buy it quickly on the market at a higher price and deliver it to the owner at a predetermined (lower) price. In such a situation, he can lose himself.[17]

Sales options

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[16] REJNUŠ, O., *Finanční trhy*. 3. vydání Ostrava:Key Publishing. 2011. ISBN 978-80-7418-128-3 str 477

[17] Depends on the size of the bonus

It works on the same principle as purchasing, except that if investor own a sales option, he have the right to sell this precious metal. Also, the option premium applies to the option publisher. If he bought a sale option, he speculate on price declines, and he want to ensure that he sell his asset at a high price in the future. If he sell a sale option, he speculate on price rises. Then, he expect the price to change and the option owner to exercise his right. If prices rise, the owner of the option does not use it and rather sells precious metal to the stock at current higher prices.

Therefore, the seller only received the option premium, but the transaction will not take place. However, if the price falls, the owner opts for the option and the seller of the sale option has to buy the precious metal at a pre-agreed price, even though it would get it cheaper on the market.

I would not recommend trading for options for a small, inexperienced investor, as the estimation of future price developments is very demanding, and if the option is purchased, the option premium is payable even if the owner does not opt the option. In addition, options are traded on the over-the-counter market, which may be associated with lower liquidity.

3.3.2 Investments in commodity indices

Another way to use commodities and hence precious metals for investment is to invest in commodity indexes. Generally, stock indices serve primarily as an indicator indicating the overall market atmosphere. In other words, they provide information on market performance, by concentrating the values of the rates of the purposed securities into a single number. It follows that the commodity index summarizes the exchange rate movements of several selected commodities to a single numerical value, and thus monitor the development trends of this market. Indices may also represent benchmark investors to compare the return on the investment instrument.

However, it is not possible to buy, for example, index shares because the indices do not have an economic realistic character and are not businesses, they only show their value[18]. However, there are ways to use these indices to invest. We choose an index that is tied to precious metals, and according to it we will divide our investment funds according to their weight in the index. Examples include commodity indexes Dow Jones-UBS Commodity Index or S & P GSCI Index, but the proportion of precious metals in these indices is very small.

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[18] SVOBODA, M. *Jak investovat aneb anatomie burzovních lží.* 1. vydání. Brno: CP Books, a.s., 2005. 198 s. ISBN 80-251-0527-X; str. 70

That's why I think the golden index of S & P Global BMI Gold, which includes stocks of gold-producing companies, is more appropriate. The disadvantage of indexing is that the investor must individually enter a purchase order for each item that the index contains, and there has been fees for small volumes of trades. Therefore, it seems more appropriate for index investments to use index certificates.

3.3.3 Index certificates

Certificates are generally classified as structured debt securities. From a legal point of view, they are considered to be bonds, ... but yields depend on the development of the underlying assets concerned. [19]For index / commodity certificates, the underlying asset is the commodity.

Can be choose an index that contains precious metals again. The certificate value then copies the value of the selected index. No fees are applicable here, as is the case with the funds, the market of certificates is not regulated by supply and demand, the price corresponds to the state of the index. There is only spread, that is, the difference between the purchase price and the selling price, which represents the remuneration for, for example, the bank that issued the certificate.

The advantage of certificates can be that if there is regrouping inside the index - that is to exchange some titles or weight representation - we do not have to pay anything[20]. There are no additional transaction fees here. A disadvantage for certificate owners is the possibility that the bank that issued the certificate may bankrupt. Therefore, it is preferable to obtain a certificate at a large bank where the bankruptcy is less likely. However, this type of investment seems to be suitable for a small investor, mainly due to low investment costs.[21]

For certificates, the subscription rate is also important, indicating the ratio in which the relevant certificate displays the value development of the underlying asset. Investor only purchase the certificate for a fraction of the value of the underlying asset. If the index has a value of 10,000 points and the certificate's subscription ratio is 1: 100, then the buyer will be 100 euros for the purchase. If the index rises, for example, by 1% to 10 100 points, the value of the certificate will also increase by 1%, ie to EUR 101. Another advantage, unlike funds, is transparency, as the investor can calculate the current price of the certificate at any time using the index value.

[19] REJNUŠ, O., *Finanční trhy*. 3. vydání Ostrava:Key Publishing. 2011. ISBN 978-80-7418-128-3 str 584
[20] SVOBODA, M. *Jak investovat aneb anatomie burzovních lží.* 1. vydání. Brno: CP Books, a.s., 2005. 198 s. ISBN 80-251-0527-X; str. 72
[21] Certificate prices generally range from 10-100 EUR and the minimum traded volume is usually 1 piece

In addition, indices can be used to invest through index funds, which can be based on the principle of copying a commodity index. The main difference and advantage over the actively managed funds are lower costs and higher returns. However, there will be other charges here.

Overall, the advantage of commodity indices is that individual instruments degrade risk. That's why investor can consider them a safer form of investment. On the other hand, this can also be a disadvantage, due to the reduced risk, in the sense of limiting the profit potential. Moreover, the investor cannot choose which individual commodities will be included in the index and their weight. Thus, it may be difficult for an investor to find an index that matches his investment requirements. Still, I would recommend this investment method to a small investor, mainly because of the benefits I mentioned in index certificates.

3.3.4 Investments in commodity funds

Collective investment can also be one way to increase your wealth through commodities and hence precious metals. In general, collective investment consists of collecting funds from the public and then investing them on the principle of risk spreading[22]. This method of investing takes place through investment or mutual funds. The main difference between these two forms of collective investment is that investment funds are separate legal entities. They can also be managed by their own management or investment company.

Most often, investment funds form a joint-stock company. Investors, thanks to their deposits, become shareholders of the fund and can thus co-decide on the Fund's activities through the General Meeting. Mutual funds, unlike investment funds, are not separate legal entities. They are set up and managed by one of the investment companies and the investor does not buy shares, but shares.

Funds can be further divided into closed and open. Closed funds have a limited number of issued shares (or units) when the fund is set up and, in addition, do not have the right to resell. Otherwise, it is for open funds, where shares (or share certificates) can be sold throughout the life of the fund. And investors may at any time exercise the right of resale. It follows that both the assets and the capital of the Fund may change.

In our case, this will specifically involve investments in funds whose underlying assets are precious metals. Here the deposited funds of the shareholders are invested in precious metals or in securities (eg shares, bonds or derivatives) linked to this asset. Since precious metals bear no interest, dividend or rent, they can therefore be recommended to long-term passive investors.

[22] REJNUŠ, O., *Finanční trhy*. 3. vydání Ostrava:Key Publishing. 2011. ISBN 978-80-7418-128-3 str 110

Investing through funds presents a number of benefits for a small investor. The most important of these is, in my opinion, that the investor is involved in buying titles that would not be available to him for individual investments. This is because the funds use a large volume of capital to invest from many investors to invest. This allows them to trade at lower transaction costs than an individual.

Another advantage is the possibility of achieving higher returns than when investing money in commercial banks and diversifying investment risk. Positive for a small investor is also the minimization of information and transaction costs. On the other hand, commodity funds include some disadvantages, in particular, fees. These are inputs that are thrown to the investor when they enter the fund, that is, before they earn anything. The amount of the fee is calculated from the amount invested and varies from fund to fund, but for equity and derivative funds this fee is up to 6%, for bond funds it is between 3-4% and the lowest for money market funds, up to 1% .

As for commodity funds, this fee is 2.5 -5%. Additionally, an administration fee is required for the management and administration of the fund, which actually reduces the profit or, increases the loss and ranges around 0.5-2%. For some funds, we may even find exit fees, but most funds do not charge for this fee. It may also happen that fund managers will not provide sufficient and transparent information about the management and changes in the Fund's portfolio. It is therefore up to the investor to consider the risks and benefits of investing this type.

3.3.5 Purchase of shares of companies that produce materials

Investor can also consider this option as an alternative to investing in commodities. This is the purchase of shares of companies that are in some way linked to the commodity, in our case with precious metals. Such companies are, for example, Barrick Gold, Newmont Mining, Goldcorp or Kinkross. However, the return on this investment depends not only on commodity price movements, but primarily depends on the stock market. As an example, I would say 2013 when, after many years of continuous growth, the gold price dropped by 28%, and the stock of gold mining companies fell by 53% (according to S & P Global BMI Gold). The value of the share can therefore be affected by various factors such as bad investments, interest rates, and government conditions.

The government governs and changes the legislative conditions in the field of environment, employment, wages, but also export and import regulations.[23] While these conditions may positively affect prices for precious metals, it does not mean that these rules will

[23] Rogers Jim Hot Commodities: How Anyone Can Invest Profitably in the World's Best Market , Random House Trade Paperbacks; Reprint edition (27 March 2007) page 55

also positively affect companies that benefit, for example, from commodities. Another risk of these investments is the possibility of unqualified company management or fraud in accounting.[24] But also other unpredictable events, whether political or environmental. For these reasons, I would certainly not recommend this type of investment to the retail investor.

3.3.6 Investments in countries producing commodities

In commodity-producing countries, economic growth can be positively influenced by rising commodity prices. If the economy grows, the stock markets in the country are also prosperous. Therefore, business of all kinds will be better in commodity-rich countries than in countries that do not have them. Similarly, exchange rates will be better in countries that export commodities than in those that import them.[25] Thus, investing in commodity-producing countries is one way of using commodities, and hence precious metals, in the recovery of funds, but it is a rather risky way.

The economy of the country affects not only the price of commodities, but many other factors., for example, the political situation in the country, the level of crime, employment, but also the legislative and business environment[26]. For small investors and above all foreign ones, it would be very difficult to get all the necessary information about the country. Additionally, it would not be necessary to gauge the future development of the economy correctly. That's why I would not recommend this kind of investment to small investors either.

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[24] Rogers Jim Hot Commodities: How Anyone Can Invest Profitably in the World's Best Market , Random House Trade Paperbacks; Reprint edition (27 March 2007) page 55

[25] Rogers Jim Hot Commodities: How Anyone Can Invest Profitably in the World's Best Market , Random House Trade Paperbacks; Reprint edition (27 March 2007) page 57

[26] Rogers Jim Hot Commodities: How Anyone Can Invest Profitably in the World's Best Market , Random House Trade Paperbacks; Reprint edition (27 March 2007) page 79

4. Practical Part

(Evaluation of Gold & Silver Market)

A precious metal is defined as a rare, naturally occurring chemical element that has high economic value and is chemically resistant. In the past, precious metals served as a currency. Now they are an investment or industrial commodity[27].. Their holdings do not bring any ordinary returns to the owner, but their purchase can be speculated on the future growth in market prices.

When investing in precious metals, the investor therefore seeks capital returns. In addition, the ownership of precious metals often gives owners the feeling of real wealth, which is due to the historical significance of these metals. Already since ancient times, people have considered them to be something extraordinary and precious, and therefore they have made jewelry and various ornaments. Moreover, precious metal coins are considered historically the first money to be found in the 7th century. B.C[28].

Among these specific types of commodities, which are call precious metals, include gold, silver, platinum, palladium, iridium, rhodium, ruthenium and osmium[29]. These metals are characterized by high specific gravity, low chemical reactivity, beautiful appearance, good workability and electrical conductivity. They are used for example in the medical, automotive, aerospace, textile and chemical industries, electronics or jewelry industries. These elements are rare and their extraction is costly, so their recycling is commonplace. This work will focus on gold and silver as they are the most traded precious metals.

4.1 Gold

Gold / Aurum - Au / is a highly valued financial asset for a long time. It is a highly glossy yellow element. In addition, this metal is characterized by its specific properties, namely chemical resistance, considerable density, extraordinary malleability, elongation and excellent electrical conductivity. Rather than industrial production, this metal is used in the manufacture of jewelry. Among the largest gold producers are China, Australia, Russia, USA and South Africa. In this work, however, this thesis will be particularly interested in the investment potential of gold, using both real and financial investments.

[27] https://www.sunshineprofits.com/gold-silver/dictionary/precious-metals/
[28] REVENDA, Z., *Peníze a zlato,* management press, Praha 2010, ISBN 978-80-7261-214-7, str.56

[29] https://www.sunshineprofits.com/gold-silver/dictionary/precious-metals/

4.1.1 The supply and demand of gold

Gold is considered to be indestructible metal, so it is no wonder that its offer is not only mining companies but also recycled gold. Gold mining is a rather stable part of the offer. The reason is that newly-opened mines do not usually increase overall production, they only replace old mines that are closed down[30]. The offer also includes recycled gold, whose stocks are offered according to the market situation. If needed, sudden demand growth can be met in the short term by increasing the supply of recycled gold. The offer also represents the share of gold in the reserves of central banks[31]. However, central banks have both a demand side and a supply side. It then depends on whether or not the central banks buy gold (they buy) or sell (offer).

Since 1971, when the Bretton Woods system was abolished, the central banks began selling their gold. The change did not take place until the time of the financial crisis, when gold turned out to be a good safeguard against inflation. Central banks have therefore begun to buy it again to diversify their foreign exchange reserves, as currencies have become riskier. Most of the central banks (especially the Central Bank of China) continue to increase their gold reserves, thereby exerting a demand side.[32]

The primary use of gold is jewelry, which normally accounts for roughly half of total demand. Another component of demand is industry, which involves the use of gold, for example in electronics or dentistry. But gold is becoming more and more used to invest, and there are many ways to invest in gold. Various investment options will be discussed in the following chapters.

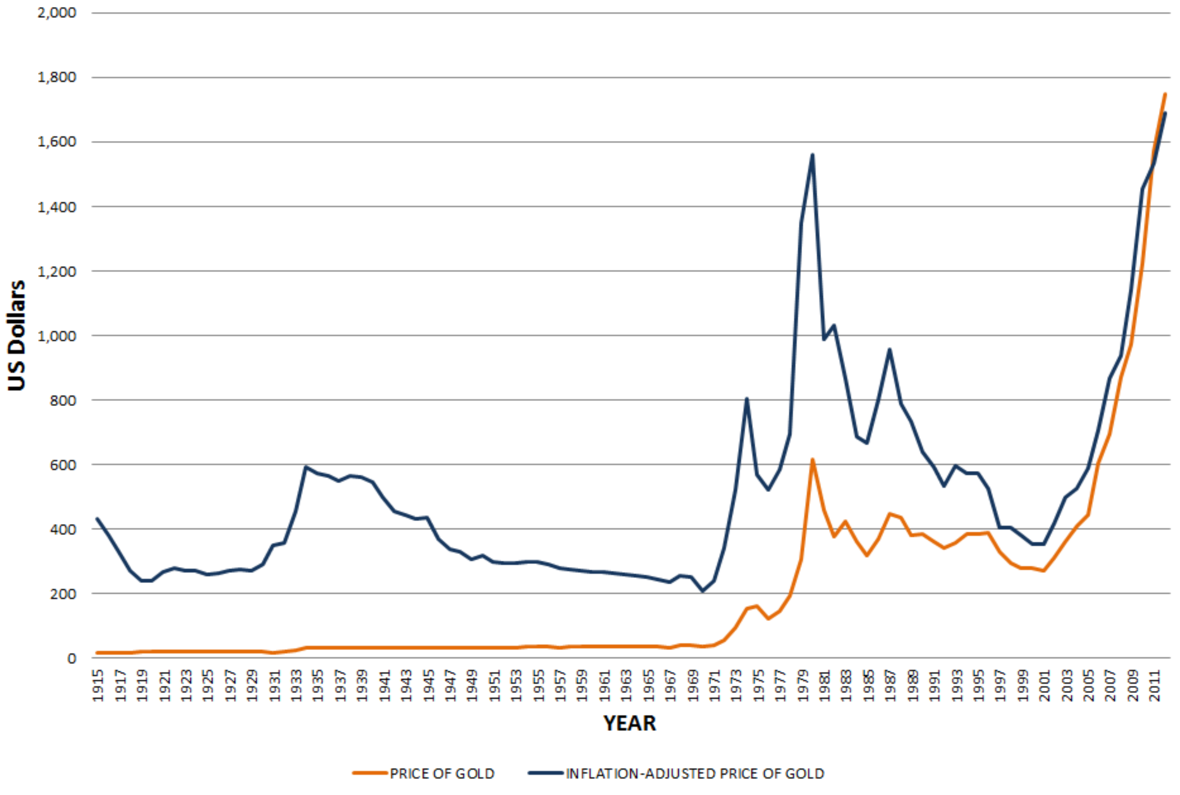
4.1.2 Evolution of the gold price

As has been said, the gold price affects the relationship between supply and demand. But far from being the only factor. The value of the US dollar also plays a significant role, and in the event of its devaluation, the gold price tends to grow and vice versa. Another important factor is inflation. As shown in Table 1, the correlation between gold and inflation is positive, which means that the price of gold is also rising as inflation rises.

[30] The conversion of a new site into a fully functional mine takes about 10 years
[31] Ceny-zlata.eu, *Základní faktory ovlivňující cenu zlata* [online].[cit.2018-3-5] Dostupné z:<http://www.ceny-zlata.eu>
[32] RWGroup.com. *Centrální banky nadále zvyšují své zlaté rezervy,* [online] [cit. 2018-03-6] Dostupné z :<http://www.rvvgroup.com/centralni-banky-nadale-navysuji-sve-zlate-rezervy

Gold is traded in dollars on the stock exchange, so its price is usually in dollars per troy ounce. One ounce weighs 31,103496 g and its brand is Oz. The current world gold price on the London fix market is announced twice a day by the most important gold traders. As of 8 March 2018, the gold price was $ 1327.20[33] per troy ounce. The price in Czech crowns is based on the current dollar / Czech crown exchange rate (as of 8. March 2018 this USD / CZK exchange rate was 20,49[34], so one troy ounce of gold was worth CZK 27 192). However, the exchange rate is only applicable to traders trading with a minimum of 1000 oz gold. Smaller stores are priced higher by so-called premiums. It is a surcharge that covers the manufacturing costs of gold processors, distribution costs and merchant margin. For a regular customer, the gold price will increase by 2 - 7% above its stock price.

Chart 1: Price of Gold vs. Inflation-Adjusted Price of Gold



Source: http://likesuccess.com/topics/34264/gold-standard

On the chart n.1 can be compared the grow of nominal price of gold, to inflaton adjusted price of gold. It can be clearly see, that no matter the inflation, the gold has hold its price until

[33] https://goldprice.org/

[34] https://www.cnb.cz/cs/financni_trhy/devizovy_trh/kurzy_devizoveho_trhu/denni_kurz.jsp

1971 when was Bretenwood system shut down. Since that, price of gold moving along with price of inflation, that's why it is favorite of many investors.

In 1999, the price of gold fell deep, and at 250 USD per troy ounce. The reason was the Bank of England, which announced its plan to sell its gold reserves. That same year he announced that the European Central Bank would not be active in the gold market over the next five years, which also contributed to the decline in the gold price. After that, the fall in the value of the dollar between 2000 and 2003 began with a rapid rise in the price of gold.

During this period, strong monetary releases also took place in the United States, accompanied by low rates and low credit availability. This money expansion has created a bubble in the asset and stock market and has therefore helped raise gold prices. During the financial crisis of the central bank, additional funds, such as the Federal Reserve (FED), the European Central Bank (ECB) and the Bank of England, were accounted for and raised the price of gold even higher. This was also due to the significant role played by central banks on the demand side. In 2011, the peak of financial crisis, this price reached record of 1900 USD.

4.1.3 New and recycled gold

Most of the total gold offer (about 2/3) is made up of "new" gold, which is possible according to the source to distinguish between the production and reinsurance business of producers. The biggest producer mined gold is China, which exports about 460 t per year and accounts for about 14% of the annual gold production (Table 5). For gold mining to be profitable with current technology (since most rocks and minerals contain gold only in a minimal amount), so one ton of rock must containing more than one gram of gold.35.

Table 2: Biggest producers of gold in 2016 in tonnes

1	China	460
2	Australia	273
3	Russia	268
4	USA	214
5	Peru	170
6	JAR	167
7	Canada	157
8	Mexiko	133
9	Indonesia	113

[35] STRUŽ, Jan a Bohumil STUDÝNKA. Zlato: příběh neobyčejného kovu. 1.vyd. Praha: Grada, 2005, 336 s. ISBN 80-247-0902-3, str. 37.

10	Brazil	95

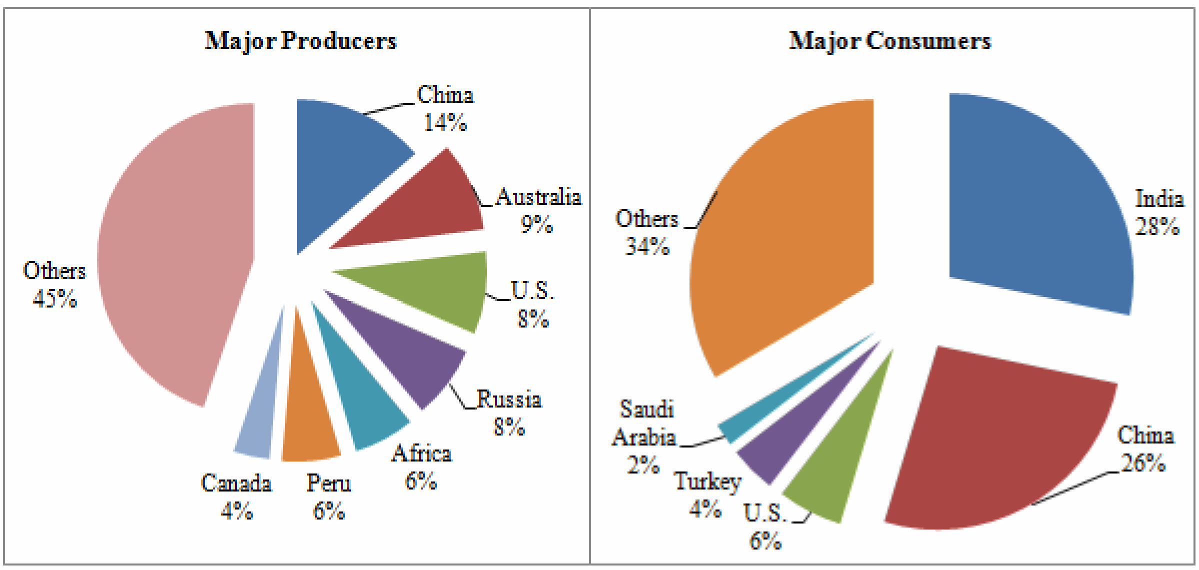
Source : http://www.gold.org/gold-mining/where-gold-mining-occurs/interactive-gold-mining-map

Producers can also negotiate a price for their "new" gold, using derivatives, which are still being used. These deals are advantageous if the gold producer wants to keep it. future price for their gold, or revenue corresponding to their current production costs. Since 2000, however, these stores have made up the minimum offered gold.

Currently, mining is taking place in places where there is a significant gold-bearing concentration Ore. 60-70% of world gold production is obtained from surface mines, the remainder from underground. The extent of mining has changed significantly over the last decade in the context of its emergence new producers, leading to less geographic concentration and more stable supply. Gold mining is one of the most expensive industries at all. Production costs were projected at 919 USD36 and can be expected due to depletion growth, as it will be necessary to extract ores with a lower gold content.

However, these costs vary considerably between individual countries and even within one country. E.g. some mines in Nevada (USA) have a production cost of about 300 USD / oz, while in Ghana there are about 1,500 USD / oz.

Chart 2, Biggest consumers VS biggest Consumers of gold



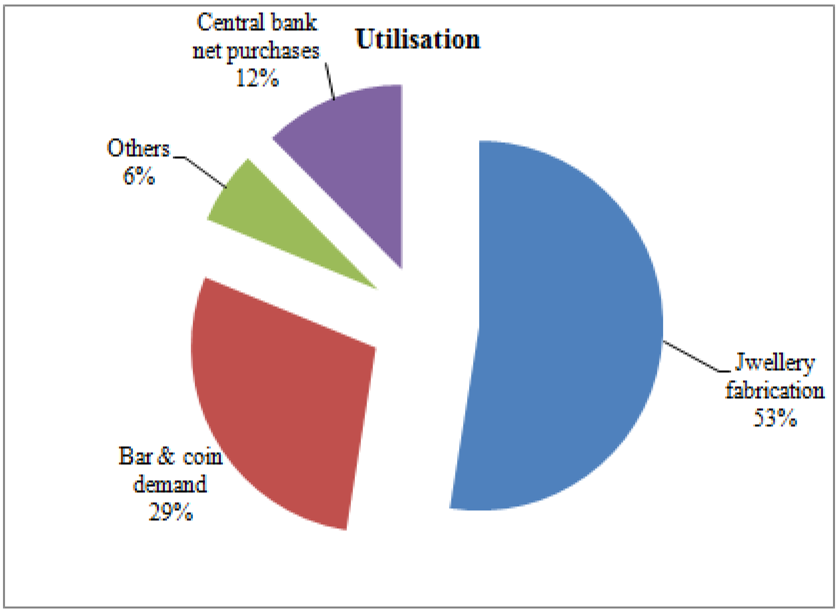
Source: World Gold Council

[36] What is the Cost of Mining Gold? [online]. Visual Capitalist, ©2017 [cit. 2017-05-01]. Dostupné z: http://www.visualcapitalist.com/what-is-the-cost-of-mining-gold/.

Source: http://www.commoditiescontrol.com/eagritrader/staticpages/index.php?id=74

Recycled gold accounts for about 1/3 of the total offer. Since gold is virtually indestructible, so gold has always existed (except for the small amount of gold that has been lost). At the end of 2015, there were 186,700 tons of gold, with gold being recycled in most cases. Since mining production is relatively inelastic, there is a supply of recycled gold helps stabilize the gold price by providing an easily negotiable gold offer.

Chart 3 Gold Utilization



Source: World Gold Council

4.1.4Unfilled stock of gold

Unfilled stocks of gold are currently at the U.S. Geological Survey of approximately 56,000 t, which means that at the current mining rate of about 3 100 tons a year[37], 77 these stocks will be used up for about 20 years. New gold deposits are becoming scarcer and have ever lower gold concentrations. Since gold is important industrial metal, so these supplies are likely to be actually consumed. In addition, in connection with the possible appearance of a new bearing, they are including preparatory processes (eg. bearing preparation, research, licensing, etc.),

[37] World gold production by year in mines from 2005 to 2015 (in metric tons) [online]. statista [cit. 2017-05-01]. Dostupné z: https://www.statista.com/statistics/238414/global-gold-production-since-2005/.

which, prior to the start of the actual mining process, gold averages 10-20 years, while only about 10%of the world's gold deposits contains enough gold for mining[38]. Nor can they be omitted either yearly tightening regulations on reducing environmental impacts, which increase the production costs of mining. Based on these facts, it is therefore possible to expect the future rise in gold prices, because its supply will decrease

4.1.5 Demand for gold

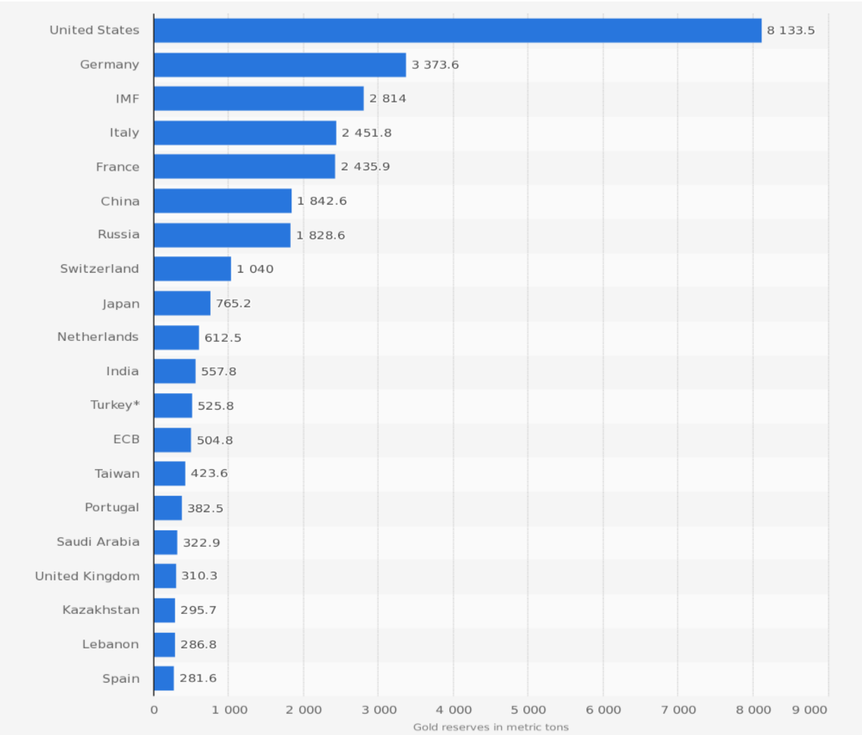
The demand for gold is mainly made by jewellery, which accounts for roughly half of the total world demand for gold. The largest gold jewelry markets are India and China, they make up together half of the demand for gold jewellery. This demand is driven mainly by the cultural role of gold in these countries and, in addition, due to limited access to financial assets it has a significant status as a value keeper. As the urban population and wealth in these countries growing, so we can expect this trend to increase, an increase the demand after gold jewelry.[39]

Due to the historical significance of gold, there is a significant use of gold for investment purposes. Gold investment accounts for about one-third of total demand, with investment demand being created investments in "paper" gold mainly by investing in gold ETFs and investments into physical gold (beads, alloys and coins). These investments are strongly dependent on the price of gold, the evolution of the domestic currency exchange rate, and whether investors feel uncertain about future development of economics and political situation.

This is the main indicator that shows that the demand for investment gold will increase, which will lead to a rise in the price of gold. In recent years there has been a sharp rise in demand for gold from central banks. Since year 2010, central banks are net buyers of gold and their demand has risen from 2%of world demand for 2010 to 14% in 2014. Current state of gold reserves of central banks is shown below.

[38] Gold exploration [online]. World Gold Council, ©2016 [cit. 2017-04-22]. Dostupné z: http://www.gold.org/gold-mining/how-gold-mined-and-project-life-cycle/exploration.
[39] Demand for Gold In Jewellery [online]. World Gold Council, ©2018 [cit. 2018-03-10]. Dostupné z: http://www.gold.org/supply-and-demand/demand/jewellery

Chart 4: Gold reserves of largest gold holding countries worldwide as of November 2017 (in metric tons)



Source: https://www.statista.com/statistics/267998/countries-with-the-largest-gold-reserves/

In addition to central banks, both gold and commercial banks buy, in particular for the purpose of adhering to an appropriate mix of assets and liabilities under the capital adequacy rules. Looking at this sector, an increase in demand linked to rising risk in the financial system can be expected, and hence pressure on price growth.

Industry accounts for about 9% of world demand for gold, with most of the industrial demand (almost 4/5) is the production of electronics. Gold, unlike silver, is not generally a major industrial metal, but its use in industry is greatly expanding, especially in sectors where growth potential can be expected, for example, nanotechnology, the automotive industry or various types of technology demanding production, e.g. in cosmetics. As investors can expect growth in demand in this sector, so we can also expect a rise in the price of gold.

4.2 Silver

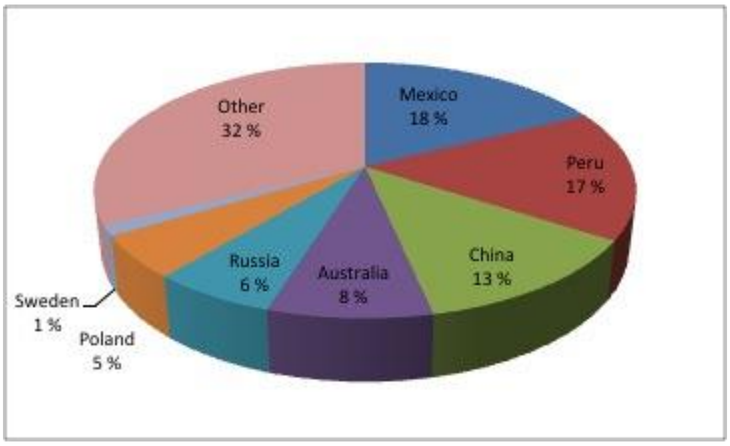
4.2.1 Silver offer

The vast majority of silver is made up of mining production that has risen for the 13th consecutive year and has reached new record - 27,579 t, with most of this volume being drawn on the American continent. Most silver (about 70%) is obtained as a by-product of mining gold, zinc, lead, nickel or copper. Bane for silver mining exists only exceptionally. Therefore, the decline in the mining of these metals is also causing the decline in silver mining.

Currently, Mexico, Peru, China, Russia and Australia are the largest producers of silver. Some countries have shown decline, China and Australia especialy. A drop in Australia was, for example, caused by the exhaustion of the silver deposit in the golden money of Mount Carlton, while in China this decline was due to a new policy of stricter measures and requirements to the development of mining, which led to the closure of many smaller mines from environmental reasons.

Production costs vary depending on whether silver is a byproduct or major mining. If silver is a by-product, average production costs 6.66 USD / oz[40]. If silver is the main subject of mining, then average production the cost was 11.74 USD / oz. In the last year, the silver price was predominant in the range of 16-20 USD / oz, making enough money for silver-producing firms for investments.

Chart 5, Silver production by country in 2017



[40] In this case, metals have also been significantly affected by silver - gold, zinc, lead or copper

Source: http://www.silver.fi/sivu/en/exploration/market/

As far as the supply of recycled silver is concerned, it depends strongly on the current silver price. However, silver is used in so small quantities that it is in many cases its recycling even impossible. Therefore, the silver offer cannot flexibly increase by recycling and share recycled silver accounts for only about 15% of the total supply. Unlike gold, therefore, offer recycled silver does not very much contribute to stabilizing the silver price, leading to greater volatile silver prices.

Currently, it is decreasing because the current silver price is roughly the same $ 18 / oz makes recycling unprofitable. Recycling has increased only in some regions, whose currencies against the dollar weakened, which increased the price of silver in their domestic currencies and increased recyclability, e.g. in Turkey or Russia. The largest suppliers recycled silver are the USA, Japan, China, Germany and Russia[41].

4.2.2 Unloaded silver stocks

It is estimated that silver stocks amount to 570 thousand tons, with more as 1/5 of them are located in Peru. At the current mining pace (about 27,600 t) would occur to deplete these stocks in about 20 years, and in addition there is an increase in extraction every year. There is also the depletion of the richest silver ores, so it will be necessary in the future to harvest ores that are not so rich in silver, and this will push for the growth of production costs. Moreover, because the deposits are limited, it is possible in the future expect a drop in supply, which would lead to an increase in the silver price.

Nowadays, there is an increase in the surplus stock of institutions working with silver (industrial enterprises, exchanges or refineries). It is obvious that the current silver price contributes to increase inventory, because it is more advantageous for them to create the inventory at the time of the current low silver price and then sell at a higher price

4.2.3 Demand for silver

The importance of jewellery for total demand is lower than gold, but it is still relatively large, as it is roughly 1/5 of the demand. In 2015, jewellery achieved its new record -7 045 t. The key market for jewellery is India, which accounts for a third of total jewellery demand (2 254 t).

[41] World Silver Survey 2016 [online]. The Silver Institute, ©2016 [cit. 2017-04-24]. Dostupné z: https://www.silverinstitute.org/WorldSilverSurvey2017.pdf.

Since India is not one of the richest countries in the world, this high demand is significantly affected by the current low price, and by the Indian preferences consumers who increase their demand for silver jewelry. Next factors can also include e-commerce that has greatly expanded the impact of silver products. Other major markets are China, Thailand, Italy (which alone accounts for more than half European Jewellery Demand) and Mexico.[42]

Investments are strongly dependent on the price and state of the silver market. Because it was very much in 2015 the low silver price, so the demand for natural silver (alloys and coins) has reached its record maximum - 9 092 t. Interest in physical silver was so great that some mints (such as the U.S. Mint) have exhausted all of their supplies and had to stop their own for some time production due to lack of silver. As the price rose slightly in 2016, it was expected reducing the demand for natural silver from this record. Indirect transactions occurred to the drop in demand for stock-exchange products, mainly due to the expected by raising the Fed's interest rates.[43]

The dominant part of global demand for gold is the industry, which is about half of total demand. Demand for silver (and due to its range and silver price) mostly varies according to the development of the economy. However, the extent of its use also varies with technical progress, which is the case for photographic films. They formed in the past decades of large share of silver use, but in recent years it has been related with the transition to digital cameras, this share reduces significantly each year what.

As silver is, however, used in many sectors that can be expected another potential for significant growth, electrotechnical or photovoltaic industry could expect growth in demand, and the rise in silver prices.

The use of silver in silver services is the smallest share of total demand, about 5% (1 957 t). Indicative is India again in this sector, which accounts for two-thirds of the entire sector, and especially in recent years there has been an Indian demand for silver for silver service an increase of 172% compared to 2012, which was a record in this area of utilization. Indian the growth is so great that it has led to the growth of the entire sector despite the fact that in Chinese demand there has been a 65% decline since 2013 and currently the second largest market - Russia - has occurred also to a slight decrease. The Chinese decline was due to a change in the donation culture when it began prefer other gifts on important occasions (such as weddings).

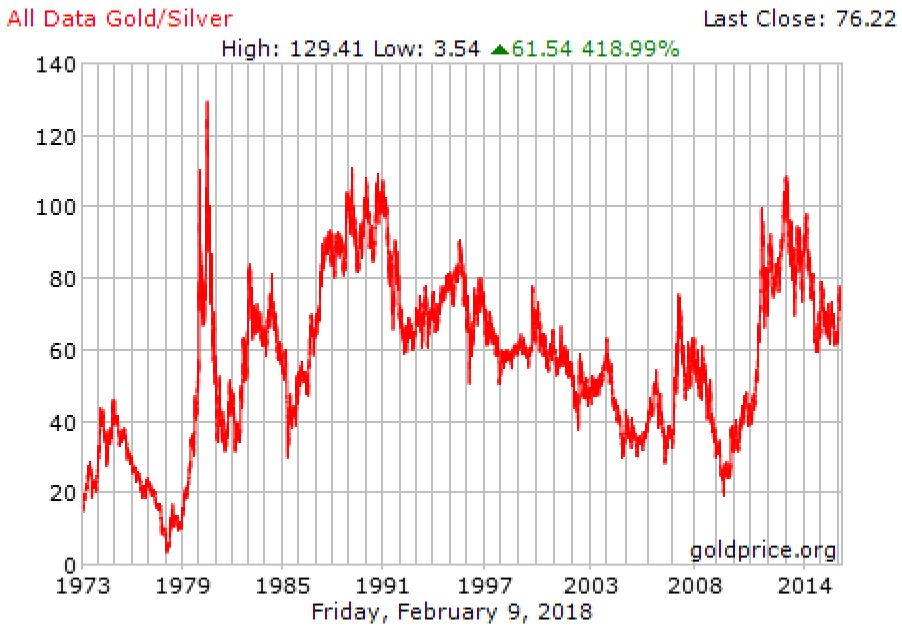
[42] World Silver Survey 2016 [online]. The Silver Institute, ©2016 [cit. 2017-04-24]. Dostupné z: https://www.silverinstitute.org/WorldSilverSurvey2017.pdf
[43] World Silver Survey 2016 [online]. The Silver Institute, ©2016 [cit. 2017-04-24]. Dostupné z: https://www.silverinstitute.org/WorldSilverSurvey2016.pdf

4.3 Gold / Silver Ratio indicator

Looking at the gold and silver market, it is also necessary to look at the Gold / Silver Ratio indicator, which serves to compare the price of gold and silver. This indicator expresses how many Trojans ounces of silver is needed to buy a single trone ounce of gold. Historically, it is adequate the value of this ratio is assumed to be about 15-20, that is, for one trio of ounce of gold is possible buy about 15 trio ounces of silver.

However, as Chart 15 shows, from this value, the current Gold / Silver Ratio is very far and far significantly higher. It was also significantly higher in recent decades[44]. Nearest worth 15 in 2011 during a sharp rise in the silver price to almost 50 USD, when dropped to 32. Since the values of this indicator are significantly higher (currently, at the end of 2017 around 75), so silver can be regarded as considerably underestimated to the gold that is for investors significantly more valuable. Therefore, in the future, it is possible to expect the silver price to rise to this ratio has moved closer to its historical value, with this increase going beyond the growth of gold.

Chart 6 Gold/Silver ratio evolution



Source: https://goldprice.org/gold-price-charts/all-data-gold-silver-ratio-history

[44] The average Gold / Silver Ratio in the period 1970-2015 was 56

4.4 Precious metals technical analysis

The following definition provides a clear description of the utilization of technical analysis:

Indicators represent a statistical approach to technical analysis as opposed to a subjective approach. By looking at money flow, trends, volatility, and momentum, they provide a secondary measure to actual price movements and help traders confirm the quality of chart patterns or form their own buy or sell signals. [45]

StochRSI is an indicator which is very often used in technical analysis, It ranges between zero and one and is created by Stochastic Oscillator Formula to a set of Relative Strenght Index values, rather than standart price data. Using Stochastic formula along with RSI values gives traders signs if the current RSI value is being overbought or oversold.[46].

Moving average (MA) is the most often used indicator in technical analysis, it helps to smooth out price movement by filtering small price fluctuations, it does showing the trend based on past prices. Very often is used to identify the trend and to determine resistance and support levels, in this theses have been used 50 days based moving averages.[47].

Bollinder bands (BB) is plotted two standard deviations away from a simple moving average[48]. It is the favorite of many traders. The price of the stock is bracketed by lower and upper band, usually along with 20-day MA. Because standart deviation measure volatility of the market, when its become more volatile the bands are widening and during less volatile times, the bands are contracting.

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[45] https://forexmetic.com/analytics/technical-analysis-indicators-oscillators/#more-5970
[46] http://technicalanalysisguide.com/glossary-term/stochrsi/
[47] https://www.investopedia.com/terms/m/movingaverage.asp
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4.4.1 Gold technical analysis

Technical analysis since 1998

Chart 7: The evolution of gold price in the last 20 years, technical analysis

(made by author)

The historical data from past 20 years indicate that the gold value follow some patterns. In the above chart, it can be seen that the relation between stock market price of Gold to USD. In order to better understand the changes of price over time the analysis will be split into periods of time that covers a certain trend or behavior:

1998-2005: During this period, the price of gold did not present significant changes. The relative movement of the price was not dramatic and the candle graphs, presented in Chart 7, indicates that the Moving average indicators during 20 and 50 days presented a small variation, indicating that the market was not volatile during this period.

2006-2007: This period shows a steady increase in the price. During this time investors did a profitable investment on gold and only minimal negative fluctuation of the price were observed. However, it is important to notice that the market presented an increased volatility in relation to former times.

2007-2011: During this time interval, a sharp increase in Gold prices can be observed. The volatility also increases leading to an increase of risk in the gold investment. It is important to notice that, during this period of time, the economic crisis hit firstly the United States economy and soon after the whole world economy. From the graph it can also be seen that, during this years, investors become more concerned with the fast-changing pace of gold prices. Such concern can be considered as one of the main motivators of the increase in volatility during this period. In spite of the high volatility and investors' concerns the gold achieved a remarkable price that has not been achieved ever since.

2011-2012: In this period gold enter a consolidation phase. Phase that ended the bull run period. Large fluctuation in the gold prices is observed, the high price of gold leads to uncertainties, and therefore the volatility grew.

2012-2015: In this period of time it can be observed that investors perceive gold as being overpriced and quickly starts to sell their assets. As a result, the prices of gold sharply decreases. In 2013 for the first time in 20 years the price crosses MA50 and stays under whole period.

2016-current: In the last two years the price is slowly consolidating, the volatility is slowly decreasing. The general trend, shown by MA20 and MA50 shoes that the prices of gold are becoming more stable.

Future (long term) prediction

Based on the analyzed data, it can be expected a consolidation phase for the next 5-10 years. Where the price will stay present and will be seen small but steady increase. Therefore, it can be said that, the next decade seems to be a good opportunity for long term investors that would like to invest into a market with small apparent risk.

4.4.2 Technical analysis of 1 year

Chart 8 Gold price evolution in past year, technical analysis

(made by author)

Above presents the current situation of the market. The graph spans over the last year and it aids in the short term prediction of the gold prices. The graph indicates that the market is currently flat, where the prices cross several times both, MA20 and MA50 lines. Also is important to noticed that, the fluctuation observed in the graph has a little impact on the actual gold price.

In the aforementioned graph, several support levels are pointed out (yellow lines) at the prices 1200, 1220 and 1240. This indicates that in spite of the up and down movement, the trend line has the tendency to go up (red line).

In addition, the resistance level gold presenting a strong resistance as indicated in the graph (blue lines). The resistance lines reached multiple times the 1360 price level but did not exceed this level. By analyzing the StochRSI level it can be noticed that gold is currently oversold.

Future (short term) prediction

Bearing in mind the StochRSI results, it is expected a short spike in the gold price. An increase in the range 1340-1350 is expected, then another decrease to the 1280-1300 range should follow. In the later range one can expect the gold price to find support and stabilize, before testing the 1360 resistance level again.

4.4.3 Silver technical analysis

Silver, long term analysis

Chart 9 Silver price history

Source: https://silverprice.org/silver-price-history.html

Chart 10 Silver price evolution in last 20 years, technical analysis

(made by author)

From a general perspective, gold and silver tend to present similar market behavior. However, gold is usually preferred by large investors that are looking forward to store their capital using stable assets. This is because, as previously mentioned, gold has less volatility and uncertainty.

By analyzing the historical data of the price of silver over a period of 20 years, the following periods can be identified:

1980s-2006: During this period, the price of silver did not present significant changes. Moreover, the silver maintained a stable value around 10 USD.

2006-2008: During this time interval, a sharp increase in silver prices can be observed. Such increase can be attributed big way to the beginning of financial uncertainty and following economic crisis.

2008-20011: During this period time, volatility largely increases and large oscillations in price are observed. Highlights are given to the 2009 where first major change in behavior against gold appear. The price dramatically dropped, loosing almost 50% of its market value. This dip were bought aggressively by large investors and by the end of the period silver started to show signs of full recovery and indicators showed a tendency to an increase in price.

2011-2016: During this time interval there is a sharp increase in the price of silver with a sudden fall, after such spike it can be observed the slow consolidation of the silver price, turning it into a more stable asset with less volatility.

Long term price prediction:

With base on the numerical data over the last decade, it can be expected that silver will continue on its consolidation phase and no significant changes in price can be expected. However, as for gold, external factors such as new economic crisis and or an increase on the demand of silver can positively influence its price.

4.4.4 Silver short term technical analysis

Chart 11 Silver price evolution in past year, technical analysis

(made by author)

In the past year silver found strong support at 15700 USD level, which is marked by yellow line. As it can be seen in the above chat, the prices of silver have reached its support level twice and at both times it has quickly recover. On the other hand, it is important to notice that, silver did not found any significant resistance when hitting the descending resistance level (the purple line).

Numerical data indicates that silver currently into a consolidation phase, crossing both, MA50 and MA20 several times during one year. Stopping at the same resistance/support levels. Such behavior, indicates that this asset is adequate for large investors.

Short term prediction

Numerical data indicates that the silver will tend to continue on its consolidation phase. Prices are expected to range between [15 700 - 17 000] USD, where the former indicates the support level an the latter indicates its resistance level.

5 Overall conclusions

In this thesis an introduction to investment of precious metals was presented. In addition, gold and silver prices were analyzed in long and short periods of time and predictions were made based on numerical assessment of the historical data.

However, it is important to note, although numerical assessments are an excellent tool to analyze historical data and provide upfront guidance for investors, they cannot assure the future price with high precision. This is because the numerical data does not take into account external influences in the market, such as increase/decrease on demand and global financial crises, among others. Therefore, investors are advised to track different external factors that may affect the price of precious metals in order to avoid the potentially misleading conclusions provided by the sole interpretation of numerical data.

External events are difficult to be predicted and can heavily influence the price. Furthermore, the prices of precious metals can vary with new technological developments and the amount of gold that is being traded in the market. In order to provide a starting point for the investor, the following points indicate the main potential factors that can have a significant impact on the future prices of gold:

- The depletion of gold stocks and the associated increase in production costs.
- The improvement of gold recycling technologies.
- Increased demand for gold jewelry in emerging economies such as India and China.
- Increase in demand for investment gold in relation to rising global risks in financial system.
- Growth in demand for gold in the banking sector, also due to rising global risks of financial systems.
- Higher industrial need for Gold. New technologies, such as the production of high capacities batteries for electric vehicles can lead to a sharp increase in the usage of gold in the automotive industry. Other industries that increase the automation of their processes, also generate a higher demand for electronics (which use gold) leading to a higher demand.

Therefore, it can be concluded that price of gold should present slow and steady growth over the next decade. What should now be nominal with the current investment in gold capital return.

In the second part of the numerical analysis, the silver market was approached. However, as it was already discussed for gold, silver price can also be influenced by external factors. Among them, highlights are given to:

- Exhaustion of silver resources will lead to a rise in production costs and a drop in supply
- Increased demand for silver jewelry in emerging economies
- Demand for silver stems from sectors that have a good potential for another growth, which should increase demand for silver.

The numerical data and the main factors that influence the price of silver indicated that it can be expected an increase in the prices of silver in the next years.

During this thesis the Gold / Silver Ratio indicator was explained, and prices of gold were compared to the silver prices. When using such indicator, it can be concluded that, in the last decades, this indicator was significant higher than its historical value, so silver can be considered as an underestimated precious metal. On the achieving the historical value of the Gold / Silver Ratio must have a silver price increase significantly

In the last part there have been examined the behavior off gold and silver on the market, both long and short term using technical analysis, and based on observed data predict future price movements. However, it is important to keep in mind that every trader can interpret the same data different way.

6 Main investment recommendations

Based on the analysis presented on this work, it can be said that long term investors are the main group of investors that should consider the acquisition of gold and/or silver assets. Such metals, provide a protection against the inflation, and actually have overgrown inflation in recent years. However, it is important to bear in mind, that the potential profits made over the last year did not show a great advantage in short term investment.

A sharp increase in the price of gold and/or silver can be expected based on external factors, such as an increase in the demand due to the usage of such material in new technological advances. However, it cannot be predicted when and to which extent such increase on demand will affect their prices. Historically biggest increase in price occur during times of financial or economic crises, so it can be great opportunity for investor who doesn’t have faith in current world economy situation. In case, no external factors will have a significant influence on their prices, the numerical data suggest that investors could reliably invest in gold and silver with minimum risks.

When comparing both metals, it can be said that silver has a higher potential than gold for long term investments, once that it has shown to recover his price better after sharp losses. In addition, the numerical analysis indicates that currently silver is underpriced. However, it is important to note that gold has less volatility of its value. That can be observed especially at the times of financial uncertainty. Therefore, the general guideline could be drafted:

For investors looking for higher relative profits and more volatility the investment on silver is advised and the for investors looking forward smaller relative profits but also lower volatility gold is advised. For investors looking forward to diversify their investments a ratio for 60:40 can be advised, favoring the investment on silver.

The investment in silver and gold it does not seem to be fully adequate for short term investors, this is because, such investors often make profit by quick changes on the market (swings). And as the numerical analysis presented on this work indicates, such time of investment would not generate as much as profit as other markets such as stocks or cryptocurrencies. Nevertheless, the silver and gold markets present lower FUD (fear, uncertainty and doubt) in comparison to other markets, making the short term investments on gold or silver less profitable but more stable than other assets and easier to predict.

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