

MODERN MARKETS AND ECONOMIC DYNAMICS OF SILVER

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Abstract: *The research paper examines the processes of silver application in the economy and its value for a selected period of time. In a world of economic and investment boom, economic entities are increasingly looking for ways to increase their financial capital by investing in various resources. Trade in precious metals and in particular silver is one of the most preferred areas for investment.*

Key words: *economic dynamics, financial markets, investment, silver.*

JEL: G10, G15

1. Introduction

This research paper examines the processes of the applicability of silver in the economy and its value for a period of time selected by the author. In a world of economic and investment boom, economic agents are looking for ways to increase their financial well-being through investment. Trade in precious metals and silver in particular is one of the most preferred areas. The object of the study is the metal silver as an investment tool. The object of the study is to investigate the price of gold using technical analysis for a time period selected by the author. The aim is to analyze the applicability and role of silver in a relatively global aspect and in the global economy.

2. Applicability of silver in the economy

Silver, as a noble metal, has existed and been known to humanity since ancient times. Silver, as a metal, has a shiny appearance and finds wide application in human life. When studying its geological origin, scientific data indicate that it is a result of natural hydrothermal processes. On the one hand, silver is a product of primary sources of silver (sulfide minerals, etc.), and the deposition of silver minerals is influenced by various factors, including temperature, pressure, fluid composition, and characteristics of the receiving rock. On the other hand, scientific data reveal that secondary sources, such as

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weathering and erosion of primary deposits, lead to the formation of placer deposits. Meanwhile, silver is also obtained from recycling silver-containing products through mining and metallurgical processes.

The study of the economic aspects of the metal silver unequivocally demonstrates its wide application in numerous sectors, including:

- industrial applications – silver is a fundamental component in the electrical and electronic industries. It is used in the production of circuit boards, batteries, solar panels, and more. Its high thermal and electrical conductivity, combined with its resistance to oxidation, make it a crucial industrial component;
- photovoltaic (PV) industry – silver paste is a component in photovoltaic cells for creating conductive gridlines that aid in the collection and transportation of electricity. The growth of the solar energy sector is increasingly driven by the demand for renewable energy sources, significantly contributing to the demand for silver;
- jewelry and silverware – in a historical context, this noble metal has been used to create jewelry, silverware, and decorative objects since ancient times. Its malleability and resistance to tarnishing make it a popular choice for these purposes. The demand for silver in the market for luxury goods, including jewelry and collectible items, significantly influences the silver industry and the economy as a whole;
- recycling and resource management – as a noble metal with limited resources, the recycling process plays a vital role in its sustainable use. Recycling efforts help recover silver from various sources, including electronic waste, jewelry, and industrial by-products. The recycling industry is linked to silver, contributing to resource conservation by reducing the need for primary silver mining and supporting a circular economy;
- medicine and healthcare – silver possesses antimicrobial properties, making it particularly valuable in the field of medicine and healthcare. Compounds based on silver, such as silver sulfadiazine, are used in the production of wound dressings, creams, and coverings to prevent infections. The demand and use of silver-based products in the healthcare industry also significantly contribute to its economic importance;
- investment and financial markets – silver, as a metal, is traded in global financial markets. Investors use silver as a means to hedge against inflation and as a store of value. Price changes associated with the demand for silver as a specific type of investment commodity can significantly impact financial markets, including futures exchanges, commodity trading, and exchange-traded funds (ETFs);

- currency and coins – historically, silver has been an essential element in the production of coins and currency. Collectible coins and silver bars serve as forms of investment and contribute to the growing development of the economy through processes in the numismatic industry, such as coin preservation, protection, and collecting, as well as various related industries;
- economic significance and global trade – undoubtedly, the production, trade, and consumption of silver as a metal have specific and proven economic implications at both the national and international levels. Countries with significant reserves or silver production contribute to the global supply chain. The fluctuating prices of silver and market dynamics have a specific impact on silver-exporting and importing nations, affecting their economies and trade balances. (Ferre, 2023)

Understanding the scientific aspects of the industrial applications of the metal silver, its economic significance, and market dynamics are essential elements that contribute to informed decision-making in policy development, resource management, and investment decisions related to this noble metal in the diverse economy.

From an economic perspective, accounting legislation is a key factor in the business environment in which a company operates. Practice shows that both at the national and international levels, the choice of appropriate accounting methods has a direct impact on the financial condition of the company. (Николова, 2005)

The study of the correlation between the applicability of silver in the economy and the possible accounting policy in trading companies highlights several important aspects that show how accounting policy in business companies relates to specific principles, methods, and procedures adopted by a given company for recording, measuring, and reporting its financial transactions and operations. These policies play a key role in preparing financial statements, including the balance sheet, income statement, and cash flow statement.

Regarding the valuation of inventory, companies dealing with products made of silver (e.g., jewelry or electronic components) must decide on the method of inventory valuation. The accounting policy can determine whether the silver inventory is valued at historical cost, market value, or at the lower of cost or net realizable value.

Accounting also plays a role in hedging and derivatives processes. Companies involved in silver mining or using silver in their production processes may be subject to price fluctuations. In such cases, accounting policy may be related to hedging strategies and derivatives accounting to forecast and manage risks associated with fluctuations in the prices of the precious metal (silver).

Another method used to protect against losses is depreciation testing. Companies that hold silver as an investment or as part of their production process

may be required to conduct depreciation tests to determine the current value of their silver assets.

3. Trends in the financial markets for silver over a selected period of time

Silver, as a noble metal, is a preferred investment tool in the global financial markets. Throughout different historical periods in the development of humanity, its value certainly changes but always retains investor interest. In the "Technology Era," there are numerous diverse methods for forecasting its value. One of the most preferred and utilized methods is the technical method, which relies on candlestick chart analysis. However, it should be noted that when this method is used independently, it cannot predict with precision, and there is always a risk of errors.

In the current scientific study, the author examines and selects three five-year periods for analyzing the price of silver against the US dollar (XAG/USD). In this case, the study aims to identify the factors that can influence and lead to an increase or decrease in the price of 1 XAG (one unit of silver).



Figure 1. Analysis of XAG/USD prices for the period from January 1, 2006, to December 31, 2010
Source: Author's calculations based on tradingview.com

Figure 1 presents a chart depicting the price for 1 XAG (silver) on a weekly basis against the US dollar for the selected period from January 1, 2006, to December 31, 2010. Over this five-year period, as shown in the figure, the price of silver gradually increased at a moderate pace. At the beginning of the analyzed period in 2006, on January 1, 2006, 1 XAG was exchanged for 9.11 USD, with an upward trend. The highest level reached by the silver price during the analyzed period was in the last week of 2010 (December 26, 2010) when one unit of the precious metal was exchanged for 30.91 USD.

From the presented data, it is evident that its price increased by nearly 300% over this five-year period. To support investors and identify the trend direction, the author utilized exponential moving averages (EMAs) in the charts, namely EMA 20 close, EMA 25 close, EMA 30 close, EMA 35 close, EMA 40 close, EMA 45 close, EMA 50 close, and EMA 55 close. At the beginning of 2006, the exponential moving averages were in an expanding position, and from April 2006 to May 2007, they maintained close to parallel positions, indicating a stable trend. The graph shows a definite contraction and a short "bearish" trend. Following the chronological processes in the graph (Figure 1), it is evident that after this price decline in August 2007, an "bullish" trend started. The period from July 2008 to January 2009 stands out, during which there was a noticeable decline in the price of silver. After this period, the value of silver returned to an upward trend. As of December 31, the values of EMA 20 close, EMA 25 close, EMA 30 close, EMA 35 close, EMA 40 close, EMA 45 close, EMA 50 close, and EMA 55 close were 25.39 USD, 24.51 USD, 23.78 USD, 23.15 USD, 22.61 USD, 22.14 USD, 21.71 USD, and 21.33 USD, respectively. From the values of the EMA close, it can be observed that they are in close parallel positions. This, in itself, creates a hypothesis that a stable upward trend in the price of 1 XAG is likely in the new selected period (January 1, 2011 – December 31, 2015).

For the scientific research, it is crucial to investigate hypothetical factors that may influence the price of silver during the period from January 1, 2006, to December 31, 2010, including:

- global economic factors – the analyzed period encompasses processes of global economic growth, recessions, and financial crises. The 2008 global financial crisis was triggered by and closely intertwined with the high-risk mortgage crisis in the United States, which had an impact on silver prices. Investment uncertainty and the search for safe-haven assets increased, leading to instability in silver prices on a global scale; (Jolly, 2008)
- USD (US Dollar) – when the US dollar weakens against other major currencies, including during periods of low-interest rates and quantitative easing measures, there is a tendency for silver prices to rise. Conversely, a strong US dollar is associated with a decrease in its influence on silver prices;
- industrial factors – silver has various industrial applications, including electronics, solar panels, and medical devices. Changes in industrial demand certainly influence the price of XAG/USD during the selected period. Economic expansions and increased industrial production lead to higher demand for silver, driving prices up. Conversely, economic slowdowns or recessions reduce industrial demand and exert downward pressure on prices;

- investment demand – silver is considered an investment asset, especially during market uncertainty and inflation concerns. The demand for silver as an investment can be influenced by factors such as geopolitical tensions, inflation expectations, and central bank policies. Increased investment demand for silver tends to drive prices higher, while reduced demand leads to price declines;
- stock market dynamics – silver is traded as a commodity, and its price is influenced by market dynamics. Factors related to supply and demand, speculative trading, and global market sentiment can significantly impact the price of XAG/USD. Changes in investor sentiment and shifts in trading patterns, including inflows or outflows of speculative capital, can also affect silver prices;
- Central Bank Actions – actions taken by central banks, including the US Federal Reserve, can influence silver prices. Decisions regarding interest rates, monetary policy measures, and interventions in currency markets can impact investor sentiment and the value of the US dollar;
- geopolitical factors – geopolitical events such as conflicts, political instability, and trade disputes have the potential to impact and also influence silver prices. These events can create uncertainty and increase demand for safe-haven assets, including the precious metal silver. The selected period includes events such as the Iraq War, tensions in the Middle East, and trade disputes between countries, which have a real impact on the price of the precious metal;
- other factors – there may be additional influences that are not explored in the current scientific research, as well as combinations of factors that lead to fluctuations in the price of 1 XAG.



*Figure 2. Analysis of XAG/USD prices for the period
from January 1, 2011, to December 31, 2015
Source: Author's calculations based on tradingview.com*

The second selected period (Figure 2) begins with the anticipated increase in the price of 1 XAG as shown in Figure 1. During this period, the highest value for one unit of the precious metal is recorded, trading at 48.00 USD. From the chronological study of the period from June 2011 to December 2012, stable trends are observed, during which the price of silver significantly decreases its value but does so relatively smoothly without sharp declines. Numerous intersections between long-term EMAs and the short-term EMA 20 create an impression of an expected "bullish" trend, but the graph (Figure 2) shows that it is followed by a period of decline, which continues until the end of the study period (2015). Indeed, it becomes evident that technical analysis alone does not accurately forecast data, and for this reason, it needs to be complemented with factor analysis. Analyzing the data at the end of the year, the lowest values of silver in the period from January 2011 to December 2015 are also considered, reaching 13.81 USD on December 27, 2015.

From the study of the position of exponential moving averages (EMAs), a trend of their parallel positioning is observed from August 2013. This could be interpreted as a signal of a prolonged trend of decreasing the value of the precious metal. Towards the end of 2015, it is noted that EMAs overlap, and their values range from 15.30 USD to 15.70 USD, hypothetically suggesting changes in the trend and logically pointing to a potential upward direction. Despite this analysis, the author explores the possible factors that may influence the price of 1 XAG:

- global economic conditions – similarly to the period studied in Figure 1, the world financial crisis of 2008 and its recovery continue to influence the analyzed period in Figure 2. This recovery is realized at different rates of economic growth in various regions, which definitely affects the price of silver for a more extended period;
- USD – the value of the USD directly impacts the value of XAG. During the selected and studied period, the value of the US dollar strengthens, affecting the value of other major currencies as well. This may result from factors such as improving economic conditions in the United States, differences in monetary policies, and demand for safe havens. Higher levels of the dollar tend to exert downward pressure on the prices of precious metals (silver) since the metal becomes relatively more expensive for holders of other currencies;
- industrial demand – these factors are related to the demand and supply of the precious metal. Therefore, changes in global industrial activity, especially in countries with developed economies, can create conditions for influencing the demand for silver during the studied period. Economic expansions and increased industrial production also lead to higher demand for silver, contributing to price increases. Similarly, during economic

slowdowns or recessions, industrial demand decreases, exerting pressure on prices;

- investment demand – precious metals are preferred investment assets, especially during periods of market uncertainty, inflation concerns, or a low-interest rate environment. The investment demand for silver can also be influenced by factors such as geopolitical tensions, inflation expectations, and central bank policies. Increased investment demand for silver is a trend that leads to price increases, while decreased demand solely leads to price declines;
- commodity market dynamics – silver is traded as a commodity, and its price is influenced by broader market dynamics. Factors such as imbalances in supply and demand, speculative trading, and overall market behavior undoubtedly affect the price of XAG/USD. Changes in investor sentiment, trading patterns, and the flow of speculative capital also influence the prices of silver during this period;
- actions of central banks – the actions and statements of major central banks, including the US Federal Reserve, significantly influence the prices of silver. Decisions regarding interest rates, quantitative easing programs, and other monetary policy measures affect investor sentiments, currency evaluations, and inflation expectations, thereby influencing the value of the US dollar and the price of silver;
- geopolitical factors – geopolitical events such as conflicts, political instability, and trade disputes possess specific potential to impact the prices of silver during this period. These events can create financial market uncertainty and increase demand for safe-haven assets. Major geopolitical events, such as the European sovereign debt crisis, geopolitical tensions in the Middle East, and economic challenges in emerging markets, are capable of affecting silver prices;
- Market sentiment and investor risk appetite – market sentiments and investor preferences for a particular risk play a decisive role in determining the price of XAG/USD during this period. Periods of increased risk aversion, driven by concerns about economic instability, financial market volatility, or geopolitical risks, typically boost demand for safe-haven assets like silver. Similarly, periods of optimism lead to decreased demand for silver as investors pursue higher-yielding or riskier assets.



Figure 3. Analysis of XAG/USD prices for the period from January 1, 2016, to December 31, 2020
Source: Author's calculations based on tradingview.com

The third period investigated by the author covers January 1, 2016, to December 31, 2020 (Figure 3). The decoded signal in Figure 2 is based on the convergence of EMAs, and the expected change in the trend occurs around February 2016 when the moving averages start expanding, and there is a slight increase in the price of silver. From 2017 to 2019, the price of silver remains stable, with no significant fluctuations in its values. The period from 2019 to 2020 is also crucial as it corresponds to the years of the global pandemic and the emergence of crises in multiple aspects. During this period, both the lowest and highest values for silver are recorded throughout the investigated period. In mid-March 2020, 1 XAG is traded on the global financial exchanges for 12.58 USD, whereas in February 2020, it reaches 28.29 USD. This short period exhibits significant price amplitude, which can be interpreted as a signal of instability in international markets when trading precious metals.

When analyzing the exponential moving averages and their positions towards the end of 2020, it becomes evident that they are in a parallel position, indicating a stable trend, which signals a period of contraction and decrease in values. As of December 31, EMA 20 close has a value of 24.38 USD, EMA 25 close – 24.96 USD, EMA 30 close – 23.52 USD, EMA 35 close – 23.11 USD, EMA 40 close – 22.72 USD, EMA 45 close – 22.36 USD, EMA 50 close – 22.03 USD, EMA 55 close – 21.73 USD. Of course, similar to the previous periods, it is essential for the study to analyze the key factors that occur during these periods, namely:

- global economic and geopolitical factors – global economic conditions play a significant role in determining the price of XAG/USD during this

- period. From 2016 to 2020, we witnessed a combination of economic expansion, trade tensions, geopolitical uncertainties, and the impact of significant events such as Brexit and the COVID-19 pandemic. These are essential geopolitical events that influence silver prices. Economic indicators, such as GDP growth rates, industrial production, and employment data, influence investors' ideas and preferences in seeking silver as an industrial and investment asset. When considering geopolitical factors, events such as trade disputes, geopolitical tensions, and political developments in countries that can potentially affect silver prices during this period are of importance. These events create uncertainty in financial markets and increase the demand for safe-haven assets, including silver;
- USD – the strength or weakness of the US dollar (USD) directly influences the price of XAG/USD. Fluctuations in the exchange rate of the US dollar are due to factors such as decisions on monetary policy, differences in interest rates, geopolitical developments, and economic indicators. A stronger US dollar, in general, exerts downward pressure on silver prices, making it relatively more expensive for holders of other currencies, while a weaker dollar tends to support silver price values;
 - industrial demand – silver has broad industrial applications, including electronics, solar panels, healthcare, and more. Changes in global industrial activity, particularly in countries with strong economies, influence the demand for silver during this period. Expanding industries, technological advancements, and increasing usage of silver in renewable energy and electric vehicles significantly contribute to the growth of industrial demand. Conversely, economic slowdown or recession reduces industrial demand, which is reflected in silver prices;
 - investment demand and financial market dynamics – investment demand for silver as a safe-haven asset and inflation hedge plays a significant role in the dynamics of its prices during this period. Geopolitical tensions, trade conflicts, and decisions in monetary policy influence investors' sentiments in using and seeking precious metals. Periods of market instability, economic uncertainty, and a low-interest rate environment often increase investment demand for silver and contribute to its price rise. Silver is traded as a commodity and is subject to a broader market dynamic. Factors such as supply and demand imbalances, changes in investor sentiments and preferences, speculative trading, and overall market conditions affect the price of XAG/USD. Developments in financial markets, including changes in equity markets, bond yields, and performance of other commodities, also influence silver prices during this period;
 - Central Bank Policies – actions and policies of major central banks, including the US Federal Reserve and other global central banks, have a

- significant impact on silver prices. Decisions regarding interest rates, monetary stimulus programs, and quantitative easing measures influence investor sentiments, currency valuations, and inflation expectations. Interventions, actions, and measures taken by central banks to stabilize financial markets during the COVID-19 pandemic also affect silver prices;
- demand and Supply Factors - Demand and supply factors specific to the silver market, including mine production, recycling levels, and changes in silver inventories, can influence the price of XAG/USD. Changes in production levels, disruptions in mining activities, and fluctuations in scrap supplies have impacted the overall supply of silver. Meanwhile, changes in industrial demand, investment demand, and jewelry consumption have influenced overall demand for silver.

This period is specific due to the scale of the global COVID pandemic and its consequences, which affected political, economic, financial, social, and societal levels, impacting human society and changing its way of life. From Figure 3, it can be observed that the price of silver during this period reached higher levels, but the pandemic also influenced factors, including:

- safe-haven demand – the pandemic spread, and the global economy faced unprecedented challenges, leading investors to seek safe-haven assets, including silver. Uncertainty surrounding the virus's impact on public health, economies, and financial markets led to increased demand for silver as a store of value and protection against inflation and currency devaluation. The heightened safe-haven demand for silver contributed to upward pressure on its price;
- contracting industrial demand – the COVID-19 pandemic resulted in widespread lockdowns, travel restrictions, and reduced economic activities, inevitably leading to a contraction in industrial demand for silver. Industries directly involved in manufacturing, automotive, and construction experienced significant slowdowns, which negatively affected the demand for silver in various industrial applications. The decline in industrial demand has a significant impact on silver prices;
- supply chain disruptions – pandemic-induced disruptions in global supply chains delayed silver deliveries. mining operations faced numerous challenges due to lockdowns, travel restrictions, and labor shortages. These disruptions, combined with reduced recycling activities, led to limited supplies of silver. Supply chain disruptions affected the price of XAG/USD, altered the balance between demand and supply, and impacted investor well-being;
- government stimulus measures – to limit and mitigate the economic impact of the pandemic, governments and central banks have implemented unprecedented stimulus measures, including fiscal stimulus

packages and easing of monetary policy. These measures aim to support businesses, individuals, and financial markets. The injection of liquidity into the financial system and fiscal expenditure programs have the potential to increase inflation expectations, directing investors towards inflation-hedging assets like silver;

- volatility and investor sentiments – the COVID-19 pandemic has caused increased instability and uncertainty in financial markets. Fluctuations in the stock market, concerns about liquidity, and changes in investor sentiments and preferences affect the demand for silver as a safe-haven asset. Periods of heightened market instability and risk aversion increase the attractiveness of silver, leading to price increases. Improved market conditions, sentiments, and economic agents' risk appetite can have a reverse effect on silver's demand and prices.

Indeed, it is important to note that the impact of COVID-19 on the XAG/USD price is not uniform throughout the entire period. The initial phase of the pandemic, from early 2020 to mid-2020, is exceptionally severe and unpredictable, and the created conditions exhibit the most significant disruptions and price movements. The price of USD is influenced by the international monetary system, which is part of currency-financial relations that can function both autonomously and serve the international movement of goods, commodities, and other factors of production. (ДИМОВ, 2016)

Despite the difficulties, the global economy is gradually recovering, vaccines are becoming more accessible, and the impact of COVID-19 is being limited. During this period, silver prices are evolving in line with other market factors. The analysis presented so far provides a general and concise overview of the impact of the COVID-19 pandemic on the XAG/USD price during the specified period. It is important to consider additional factors for a more in-depth analysis, including examining specific market events and news to understand the full extent of the pandemic's influence on silver prices.

4. Conclusion

Noble metals find extensive applications in human society, including various fields such as investment and finance. The present scientific research is the author's interpretation, which examines, investigates, and analyzes the movement of prices in XAG/USD based on historical data. This historical analysis reveals a certain understanding of the potential drivers of silver prices. The interdependencies and interactions among different factors influence price changes. These relationships can be dynamic and subject to alteration based on evolving market conditions and unforeseen events.

Furthermore, as a recommendation for future research, in order to achieve more precise and specific forecasts for the price of 1 XAU, studies may focus on

analyzing correlations and market-specific events, investor interests, and other related factors.

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