

PRICE DEVELOPMENT OF GOLD AND S&P 500 INDEX AS A DETERMINANT OF INVESTMENT BEHAVIOR: A COMPARATIVE ANALYSIS

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Abstract:

Research background: While gold is traditionally viewed as a safe haven and a store of value, especially in times of economic uncertainty, the S&P 500 index reflects broader market sentiment and offers higher return potential over the long term—albeit with greater volatility.

Purpose of the article: The aim of this study is to provide a comparative analysis of the price development of gold and the S&P 500 index across different time periods and economic conditions, in order to offer recommendations for optimizing investment decisions and enhancing portfolio diversification.

Methods: The theoretical framework is based on investment decision-making from the perspective of risk, return, and individual investor preferences. The empirical part analyses historical data on the price development of gold and the S&P 500 index from February 2015 to February 2025, with the Pearson correlation coefficient indicating a moderately strong and statistically significant relationship between the two assets. To support investment decision-making, the multi-criteria decision-making method TOPSIS was applied, enabling the evaluation and ranking of various investment instruments according to the preferences of conservative and risk-oriented investors.

Findings & Value added: The findings highlight significant differences between the analysed assets in terms of volatility, return potential, and behaviour during different phases of the economic cycle. Gold shows the characteristics of a safe-haven asset, while the S&P 500 index appears more attractive for investors with a longer time horizon and higher risk tolerance. The added value of the study lies in its integration of quantitative analysis with behavioural aspects of investing and the implementation of multi-criteria decision-making as a tool for personalized investment recommendations. The study also opens space for future research focused on dynamic correlation models and the inclusion of other asset classes and investor profiles.

Keywords: investment; S&P index; gold; portfolio; TOPSIS

JEL Classification: C44; D81; G11

1. Introduction

Currently, investment gold is considered a highly valuable financial as well as tangible asset over the long term. In the past, gold was used as a form of currency; today, it is rather viewed as a store of value (Barunik et al., 2016). Gold belongs to the commodity group, alongside other precious metals and oil. This group does not generate added value in the same way that various types of stocks or bonds do. Investors profit only if the price of gold increases due to rising future demand, allowing them to sell the commodity at a higher price than the original purchase price (Kazak et al., 2025).

There are various forms of investing in gold: physical gold (the most widespread form of investment in gold, such as purchasing coins, jewellery, or bullion bars); Gold Exchange-Traded Funds (ETFs) – a form of investment in which investors do not have to own physical gold; ETFs are traded on stock exchanges. Examples include GOLDBEES (Reliance Gold ETF), AXISGOLD (Axis Gold ETF), SBIGOLDETF (SBI Gold ETF); Gold Mutual Funds – mutual funds that invest in physical gold and ETF funds. Currently, investors prefer to invest primarily in gold ETFs and gold mutual funds, which represent indirect investments in gold. This method is preferred mainly because investors can participate in the market without the need to physically own gold (Nawaz and Sudindra, 2013).

Gold is considered an investment tool that provides security to investors, especially due to market instability (the mismatch between supply and demand). The supply of gold is limited, while demand is either stable or constantly growing. This relationship leads to an increase in gold prices (Verma and Dhiman, 2020).

Investing in gold is especially suitable as an alternative for minimizing risk. Gold prices are relatively stable compared to stocks, which can fluctuate daily. Another reason for investing in gold is inflation protection. When interest rates rise and the value of the dollar falls, the price of gold tends to remain relatively stable. During the financial crisis between 2007 and 2009, the price of gold rose while the S&P 500 stock index declined. In 2008, at the peak of the crisis, gold increased by 4.32%, whereas the S&P 500 experienced a drop of as much as 37% (Choudhry et al., 2015).

The price development of gold since 2000 can be observed in Figure 1, which shows its evolution up to the present day.



Source: *finance.yahoo.com*

Stocks can be characterized as a type of equity security that entitles the shareholder (holder) to participate in the management of a joint-stock company. In addition to this right, they are entitled to a portion of the profit in the form of dividends. Stocks play a key role in the capital market, where they are the most widespread (Vojtekova et al., 2025). Stocks are generally bought and sold on stock exchanges, each of which has different trading hours. For stock investing to be successful, market knowledge is crucial. The price of a stock changes based on

supply and demand: demand consists of investors wanting to buy, and supply of those wanting to sell. When more investors want to sell, stock prices fall; conversely, when more investors want to buy, prices rise. Other factors also influence stock value, such as production expansion, a company's financial performance, international expansion, and more (Pietrucha and Maciejewski, 2024). The S&P 500 stock index, also known as the Standard & Poor's 500, includes the shares of 500 American companies. These stocks are traded on exchanges such as the New York Stock Exchange and NASDAQ. The index is regarded as an indicator of the performance of the U.S. economy. The S&P 500 consists of companies from 11 sectors, with the largest representation in information technology, healthcare, and consumer goods (Maghyereh et al., 2025). As shown in Table 1, the company with the greatest weight in the index is Apple, followed by Nvidia and Microsoft.

Table 1: S&P companies

Company	Symbol	Weight (%)
Apple Inc.	AAPL	6.76
Nvidia Corp	NVDA	6.04
Microsoft Corp	MSFT	6.00
Amazon.com Inc	AMZN	3.87
Meta Platforms, Inc	META	2.74
Alphabet Inc. Class A	GOOGL	2.03
Berkshire Hathaway	BRK.B	1.97
Broadcom Inc.	AVGO	1.91
Alphabet Inc. Class C	GOOG	1.67
TESLA, Inc.	TSLA	1.43

Source: authors according to slickcharts.com (2025)

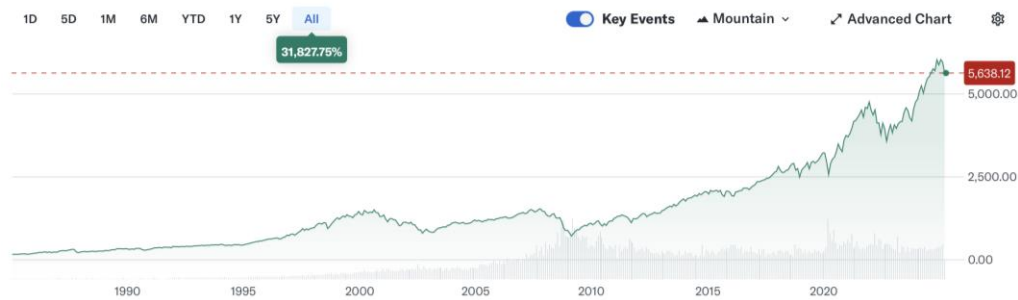
The performance of the S&P 500 index is influenced by various factors, such as technological innovations, macroeconomic factors, and market dynamics. A key role is played by exogenous factors, such as geopolitical events and technological changes, which affect the profitability of the index. Macroeconomic factors also play a significant role in the progression of the S&P 500. Among the most important macroeconomic indicators are interest rates, inflation, unemployment, and gross domestic product (GDP). The S&P 500 holds a dominant position and can influence the overall market condition when significant changes occur.

The most notable declines in the index were observed during the global financial crisis between 2007–2008 and at the onset of the COVID-19 pandemic in the years 2020–2021. During these crisis periods, significant volatility was recorded, driven by a combination of external factors. Strict regulations implemented during the COVID-19 pandemic negatively impacted sectors that are part of the S&P 500. Central banks eased monetary policy, aiming to increase market liquidity and stability by lowering interest rates. During this time, governments sought to provide support to individuals and businesses through fiscal measures. The pandemic heightened uncertainty among investors, which led to increased volatility (Nagy et al., 2024).

The development of the S&P 500 stock index from 1980 to the present is illustrated in Figure 2, showing long-term growth despite temporary fluctuations.

Comparative analysis of gold price development and the S&P 500 index plays a key role in understanding financial market behaviour and optimizing investment decisions. Gold and the S&P 500 represent two fundamentally different approaches to capital allocation (Nagy et al., 2024). While gold has traditionally been viewed as a store of value and a hedge against inflation and geopolitical tension, the S&P 500 index reflects a dynamic, growth-oriented segment of the market, representing the performance of 500 of the largest publicly traded companies in the United States (Triki and Maatoug, 2021). The distinct nature of these assets is evident in their historical development, volatility, returns, and their respective reactions during periods of crisis and expansion (Muguto and Muzindutsi, 2022).

Figure 2: S&P 500 Index Price Development



Source: *finance.yahoo.com* (2025)

From the turn of the millennium to 2024, several critical events have highlighted the divergence between gold and equities. During the bursting of the tech bubble in 2000, investors began shifting from riskier assets into safer havens, which led to a gradual increase in gold prices. Between 2007 and 2009, during the global financial crisis, the S&P 500 index plummeted by more than 50% of its value, while gold continued its ascent, culminating in a historic peak of over \$1,900 per ounce in 2011. This trend reinforced gold's role as a capital preservation tool during times of uncertainty (Mohammed et al., 2024).

Conversely, in the post-crisis recovery period after 2012, and especially during the bull market from 2013 to 2019, the S&P 500 experienced exceptional growth. This expansion was driven by accommodative monetary policy, technological innovation, and increasing investor appetite for risk. During these years, S&P 500 returns far outpaced those of gold. In 2020, however, the COVID-19 pandemic led to a short-term market downturn and a renewed surge in gold prices, which reached a new all-time high of over \$2,070 per ounce in August 2020. This again underscored gold's perceived safety during systemic risk events (Bircea and Popa, 2025).

Following the pandemic, stock markets rebounded rapidly thanks to aggressive stimulus measures, with the S&P 500 reaching new records in 2021. In contrast, gold prices stagnated and even declined slightly, largely due to rising interest rates and a strengthening U.S. dollar. In 2022, amid high inflation and geopolitical tension following Russia's invasion of Ukraine, demand for gold increased once again. Nonetheless, the combined strength of the technology sector and robust consumer demand helped maintain the S&P 500's position as a dominant source of returns over the medium term (Cardillo and Basso, 2025).

From a quantitative perspective, comparing average annual returns reveals that the S&P 500 has delivered about 8–10% per year (including dividends) over the past two decades, whereas gold has averaged around 5–6%. However, performance differences are significantly influenced by market timing and macroeconomic conditions (Doeswijk et al., 2020). Gold also exhibits lower correlation with the stock market, making it an important diversification tool. While its volatility is lower than that of equities, gold may underperform over long periods of economic growth, as it does not provide any regular income, such as dividends or interest.

From the standpoint of investment decision-making, it is crucial to consider these differences in a broader context. Gold should not be viewed as a competitor to stocks but rather as a complementary asset. Especially during times of anticipated recession, rising inflation, or geopolitical instability, gold can stabilize portfolio value and mitigate losses from declining stock markets (Zhou and Liang, 2025). Conversely, during periods of strong economic growth, low inflation, and a favourable business environment, equities offer higher growth potential. Therefore, effective investment strategy lies not in favouring one asset over the other, but in

combining them wisely based on the investor's risk profile, investment horizon, and current macroeconomic signals (Vega-Gamez and Alonso-Gonzalez, 2024).

Modern portfolio management theories, such as Harry Markowitz's Modern Portfolio Theory, support the concept of diversification through combining assets with low correlation. In this regard, gold serves as a hedge against systemic risk, while the S&P 500 offers exposure to economic growth. In practice, it is recommended that gold make up 5–15% of a diversified portfolio, depending on the investor's preferences and risk perception (Ahmed et al., 2022). Dynamic investors with longer time horizons may prefer greater exposure to equities, whereas conservative investors or those nearing retirement may increase their allocation to defensive assets such as gold (Dima et al., 2025).

In conclusion, although gold and equities represented by the S&P 500 belong to two distinct asset classes, their combination can form a robust and stable portfolio resilient to market fluctuations while offering attractive return potential. The choice between them should never be based on a “one-or-the-other” dichotomy, but rather on a rational and strategic assessment of current conditions and individual investment goals. In a changing world where uncertainty often dominates financial markets, diversification remains one of the few true forms of protection for investment capital.

2. Methodology

There are many comparative analyses that allow us to evaluate various indicators. For the purpose of comparing investment instruments, specifically, examining gold and stocks in the context of investment decision-making, we have chosen to use the TOPSIS method.

The TOPSIS method is one of the most effective multi-criteria decision-making techniques, particularly due to its high consistency and relatively low computational complexity. This approach is based on combining multiple values in order to derive a single result (Madanchian and Taherdoost, 2023).

TOPSIS is characterized as a comparative method that assesses all alternatives based on their distance from an ideal solution, which represents hypothetical options offering maximum benefit at the lowest cost. The opposite of the ideal solution is a scenario where maximum costs are incurred without achieving sufficient benefits (Juracka et al., 2024).

In this case, when applying the TOPSIS method, we compare gold with three different types of stocks that vary across different parameters. As shown in Table 3, which presents the initial decision matrix, we selected, besides the already mentioned S&P 500 index which includes the 500 largest publicly traded companies in the United States, the dividend-focused stock VYM (Vanguard High Dividend Yield ETF). This ETF is characterized by investing in companies that pay high dividends. VYM is an exchange-traded fund comprising over 500 large-cap U.S. companies. These companies are primarily active in the financial, industrial, and consumer staples sectors. The main advantage of this fund is the stable income it provides, as the individual companies tend to have high yields and a broad sectoral focus.

As the final alternative, we selected the NASDAQ Composite stock index, which is among the most well-known stock indices alongside the S&P 500. It primarily includes companies focused on information technology. The NASDAQ Composite Index consists of over 3,700 companies, all of which are traded on the NASDAQ exchange. The index is dominated by companies such as Apple, Microsoft, Alphabet, and Meta. These firms are among the largest in terms of market capitalization and, due to their significant representation in the index, they have the greatest influence on the overall performance of the investment (Nagy et al., 2025).

Table 2: Basic matrix

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	16.55	155,560	7.70	0.38
S&P 500	18.21	3,386,529	10.43	0.65
VYM	10.10	1,107,384	9.77	0.25
NASDAQ Composite	22.98	6,411,941	19.7	0.78

Source: own elaboration according to *finance.yahoo.com* (2025)

In Table 2, we can see the four criteria by which the alternatives were compared. Volatility is expressed as a percentage and is understood as the speed at which the price changes—the lower the volatility, the smaller the price fluctuations (Gupta and Mishra, 2024). The lowest volatility values are observed for the dividend stock VYM and gold, while the NASDAQ Composite index has the highest volatility. The next criterion we selected is liquidity. Among the chosen investment instruments, the NASDAQ Composite is the most liquid, with a value of USD 6,411,941. The average annual return is the penultimate criterion. Gold has the lowest return, at 7.70% annually. However, gold represents an investment that offers a consistently growing return over time for investors. The final criterion is the Sharpe ratio, which measures the performance of an investment in relation to its risk (Auer and Schuhmacher, 2013). The lowest Sharpe ratio is found in the dividend stock VYM, followed by gold, then the S&P 500, with the NASDAQ Composite showing the highest Sharpe ratio. The next step in the TOPSIS method is to create the Saaty matrix to obtain normalized weights. In the Saaty matrix, the criteria are compared with each other and individual preferences are selected. We selected two types of investors: a conservative investor and a risk-seeking investor. The conservative investor prefers minimizing risk, stability, and liquidity, while the risk-seeking investor is inclined toward higher returns and is willing to accept higher risk. Due to these differing investment strategies and preferences, we created two separate matrices in order to more accurately determine which investment instruments would be more suitable for each type of investor.

3. Results and Discussion

The first Saaty matrix was constructed for the risk-seeking investor. Based on Table 3, we calculated the geometric mean. The sum of the normalized weights should always equal 1.

Table 3: Saaty matrix (risk-seeking investor)

	Volatility	Liquidity	Average annual yield	Sharpe ratio	Geometric mean	Standard weights
Volatility	1	1/5	3	3	1.16	0.184
Liquidity	5	1	9	7	4.21	0.668
Average annual yield	1/3	1/9	1	3	0.58	0.092
Sharpe ratio	1/3	1/7	1/3	1	0.35	0.056
Total					6.30	1.00

Source: own elaboration

The next step was the creation of the criteria matrix (Table 4), where we defined the maximization and minimization criteria. Volatility is the only minimization criterion. Liquidity, average annual return, and the Sharpe ratio are considered maximization criteria.

Table 5 presents the transposed matrix, where the minimization criteria are converted into maximization criteria by subtracting all other values from the highest value.

Using the values in the transposed matrix, we can create a normalized matrix, which is calculated in Table 6.

Table 4: Criterion matrix (risk-seeking investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	16.55	155,560	7.70	0.38
S&P 500	18.21	3,386,529	10.43	0.65
VYM	10.10	1,107,384	9.77	0.25
NASDAQ Composite	22.98	6,411,941	19.7	0.78

Source: own elaboration

Table 5: Transpose matrix (risk-seeking investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	6.43	155,560	7.70	0.38
S&P 500	4.77	3,386,529	10.43	0.65
VYM	12.88	1,107,384	9.77	0.25
NASDAQ Composite	0.00	6,411,941	19.70	0.78

Source: own elaboration

Table 6: Normalized matrix (risk-seeking investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	0.424	0.021	0.302	0.342
S&P 500	0.315	0.462	0.409	0.584
VYM	0.849	0.151	0.383	0.225
NASDAQ Composite	0.000	0.874	0.772	0.701

Source: own elaboration

The final step before calculating the ideal and basal variant is the computation of the normalized weights for each criterion. This matrix is called the weighted matrix (Table 7). The normalized weights for the criteria are obtained by multiplying all values in the normalized matrix by the corresponding weight of each criterion. The values for volatility are multiplied by a weight of 0.184, liquidity by 0.668, average annual return by 0.092, and the Sharpe ratio by 0.056.

Table 7: Weighted matrix (risk-seeking investor)

Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
0.184	0.668	0.092	0.056
0.078	0.014	0.028	0.019
0.058	0.308	0.037	0.033
0.156	0.101	0.035	0.013
0.000	0.584	0.071	0.039

Source: own elaboration

Then ideal and basal values are calculated; these values represent the highest (H) and lowest (D) value of each individual criterion (Table 8).

Table 8: Ideal and basal variants (risk-seeking investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
H	0.156	0.584	0.071	0.039
D	0.000	0.014	0.028	0.013

Source: own elaboration

The final step in the TOPSIS method is calculating the distance from the ideal variant (using the Euclidean distance measure). Based on the values of c , we determine the ranking of the individual alternatives. When the c value of a particular alternative is the highest, that alternative ranks first. The result of the TOPSIS method for a risk-seeking investor is shown in Table 9. The highest value of the c indicator was achieved by the NASDAQ Composite stock index, which means that for an investor seeking risk, the recommended investment is in

NASDAQ Composite stocks. Conversely, based on the given preferences, gold is the least attractive investment option.

Table 9: Calculation of distance (risk-seeking investor)

	d+	d-	c	Ranking
Gold	0.577	0.078	0.119	4
S&P 500	0.295	0.301	0.505	2
VYM	0.485	0.179	0.269	3
NASDAQ Composite	0.156	0.572	0.786	1

Source: own elaboration

Since we are primarily comparing the S&P 500 stock fund and gold, Table 10 shows that the value of the c indicator for the S&P 500 is 0.505, while for gold it is 0.119. This implies that for an investor inclined toward risk, the recommended investment is primarily in the S&P 500 stock fund.

The Saaty matrix also serves as a tool for calculating the consistency ratio. The consistency of the matrix is assessed based on the preferences of a risk-seeking investor by multiplying the Saaty matrix by the corresponding weight vector. The higher the Consistency Index (CI) value, the greater the deviation from consistency. A value closer to zero indicates a higher level of consistency. The results of this calculation are recorded in Table 10, which is further used in the next steps of the analysis.

Table 10: The result of multiplying the matrix by the corresponding vector (risk-seeking investor)

				Result
0.041	0.079	0.017	0.051	0.188
0.286	0.551	0.757	0.772	2.365
0.370	0.110	0.150	0.090	0.715
0.200	0.180	0.450	0.260	1.099

Source: own elaboration

To obtain the value of the consistency ratio (CR), we calculate the ratio between the consistency index and the random consistency index. Since we are considering four criteria in our case, we used a random consistency index value of 0.089. The calculated CR value was 0.092, which means that our comparison is consistent. If the consistency ratio $CR \leq 0.10$, the matrix can be considered sufficiently consistent; otherwise, it is necessary to reconsider the weighting comparison among the criteria.

We also applied the TOPSIS method for a conservative investor in order to determine which investment instruments would be most suitable for them based on the results. We used the basic matrix, which defines all the values for the individual alternatives.

To obtain the normalized weights, we created a Saaty matrix where we applied preferences that would typically be characteristic of a conservative investor. All the preferences, followed by the calculation of the geometric mean and normalized weights, are recorded in Table 11, where the total geometric mean came out to be 6.16. The normalized weights, which we will use in the later calculations, were as follows: for volatility 0.588, for liquidity 0.041, for average annual return 0.111, and for Sharpe ratio 0.237.

In the next step, we constructed the criteria matrix. We followed the same procedure as with the investor inclined toward risk, identifying both maximization and minimization criteria. Since we are working with the same set of criteria, the only minimization criterion is volatility. All the results were recorded in the following Table 12.

Table 11: Saaty matrix (conservative investor)

	Volatility	Liquidity	Average annual yield	Sharpe ratio	Geometric mean	Standard weights
Volatility	1	9	7	3	3.71	0.602
Liquidity	1/9	1	1/5	1/5	0.26	0.042
Average annual yield	1/7	5	1	1/3	0.70	0.113
Sharpe ratio	1/3	5	3	1	1.50	0.243
Total					6.16	1.0

Source: own elaboration

Table 12: Criterion matrix (conservative investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	16.55	155,560	7.70	0.38
S&P 500	18.21	3,386,529	10.43	0.65
VYM	10.10	1,107,384	9.77	0.25
NASDAQ Composite	22.98	6,411,941	19.7	0.78

Source: own elaboration

The criteria matrix serves as an intermediate step in the creation of the transposed matrix. In the transposed matrix, for the minimization criterion, we subtract all other values of the individual criterion from the highest value. This gives us Table 13 with the new values of the individual alternatives.

Table 13: Transpose matrix (conservative investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	6.43	155,560	7.70	0.38
S&P 500	4.77	3,386,529	10.43	0.65
VYM	12.88	1,107,384	9.77	0.25
NASDAQ Composite	0.00	6,411,941	19.70	0.78

Source: own elaboration

As we defined the calculation of the normalized matrix for the risk-seeking investor, we followed the same procedure for the conservative investor. Through this calculation, we obtained the normalized matrix (Table 14).

Table 14: Normalized matrix (conservative investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
Gold	0.42	0.02	0.30	0.34
S&P 500	0.31	0.46	0.41	0.58
VYM	0.85	0.15	0.38	0.22
NASDAQ Composite	0.00	0.87	0.77	0.70

Source: own elaboration

The normalized weights obtained from Table 13 are used in the calculation of the following Table 15. The values in the table are derived by multiplying the normalized weights of each criterion by the corresponding values from the normalized matrix. The weights used for the multiplication are as follows: volatility (0.588), liquidity (0.041), average annual return (0.111), and Sharpe ratio (0.237).

Table 15: Weighted matrix (conservative investor)

Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
0.602	0.042	0.113	0.243
0.255	0.001	0.034	0.083
0.189	0.019	0.046	0.142
0.511	0.006	0.043	0.055
0.000	0.036	0.088	0.170

Source: own elaboration

We continue with the calculation of the ideal and baseline variants for each criterion, which means identifying the maximum (H) and minimum (D) values from the weighted matrix for the conservative investor. All values are recorded in Table 16.

Table 16: Ideal and basal variants (conservative investor)

	Volatility (%)	Liquidity (USD)	Average annual yield (%)	Sharpe ratio
H	0.5112	0.0366	0.0875	0.1702
D	0.0000	0.0009	0.0342	0.0545

Source: own elaboration

To determine the final ranking of investment instruments for a conservative investor, we need to calculate the distances from the ideal and nadir solutions. We recalculated the values of d^+ and d^- , which are necessary for computing the indicator c . The values of c for each instrument are as follows: gold 0.480, S&P 500 0.391, VYM 0.801, and NASDAQ Composite 0.206. According to this calculation, it is clear that a conservative investor is advised to invest in the dividend stock VYM and gold, which ranks second, as shown in Table 17. For the conservative investor, the NASDAQ Composite stock index is the least preferred option.

When comparing the S&P 500 stock index and gold, based on the ranking, it can be concluded that gold is the primary recommended investment for a conservative investor.

Table 17: Calculation of distance (conservative investor)

	d^+	d^-	c	Ranking
Gold	0.278	0.257	0.480	2
S&P 500	0.326	0.210	0.391	3
VYM	0.127	0.511	0.801	1
NASDAQ Composite	0.511	0.132	0.206	4

Source: own elaboration

To verify the pairwise comparison in the Saaty matrix, we calculate the consistency ratio. All calculations and results are recorded in Table 18.

Table 18: The result of multiplying the matrix by the corresponding vector (conservative investor)

				Result
0.602	0.377	0.794	0.728	2.501
0.067	0.042	0.023	0.049	0.180
0.086	0.210	0.113	0.081	0.490
0.201	0.210	0.340	0.243	0.993

Source: own elaboration

We proceed in the same way as with the investor inclined toward risk. We calculate the value of the indicator $\lambda_{\max}$. The calculation yielded the value 4.215. Next, we calculate the inconsistency index, which gave us a value of 0.072, and then the consistency ratio (CR). Since we are considering four criteria for the conservative investor, we again used the value of the random consistency index 0.089. The CR calculation resulted in a value of 0.080. Based on this result, we conclude that our comparison is consistent.

Based on the calculations from the TOPSIS analysis for the selected types of investors, we can assess that the comparisons align with expectations. These results can assist in investment decision-making and portfolio construction, helping to guide investors toward specific investments. When comparing the S&P 500 index and gold, we can conclude from the TOPSIS results that, based on preferences, a conservative investor is recommended to invest in gold, while an investor who prefers risk is advised to invest in the S&P 500 index.

In addition, we collected historical price data for gold and the S&P 500 index on a daily basis from February 2015 to 2025 (Figure 3), in order to map the development of both

instruments over the past 10 years. Using this data, we created Figure 3, which illustrates the growth and decline of these investment tools in different periods.

Figure 3: The price trends of gold and S&P 500 index



Source: own elaboration

A significant drop in the S&P 500 index during the observed period can be seen especially in the year 2020, when the COVID-19 pandemic prevailed globally. This pandemic triggered a global crisis that affected the economies of all countries and also had a substantial impact on the stock market (Zhang et al., 2020). Based on the research of Pekar et al. (2022), it is clear that COVID-19 caused declines in various investments and also negatively affected stock markets. During this period, the S&P 500 adjusted its investment strategy to mitigate further losses by reallocating investments primarily into sectors such as healthcare, information technology, and communication services. As a result, the portfolio during this time had increased allocations to stocks like NVIDIA, Netflix, AbbVie, Regeneron, etc. Currently, the portfolio composition of the S&P 500 is significantly different.

In 2022, we observed another decline in the index, which, according to Sharif et al. (2025), was caused by the tightening of monetary policy, leading to interest rate hikes. Other contributing factors to this downturn included inflation and geopolitical uncertainties such as the Russia–Ukraine conflict, which caused a rapid surge in energy prices, thereby increasing inflation and creating further uncertainty in the stock markets. From the end of 2023 onward, we have been observing a growing trend in the S&P 500 index.

In Figure 3, we can also observe the development of gold prices. From 2015 to 2020, gold experienced only a modest increase, which could be attributed to low inflation in the United States and low interest rates. There was no significant price expansion of gold during this period; on the contrary, prices remained relatively flat. A turning point came in 2020 with the outbreak of the pandemic (Valadkhani et al., 2022). COVID-19 had the opposite effect on gold prices compared to the S&P 500 index. Investors began investing more in safe-haven assets such as gold, primarily due to uncertainty. This rise in gold prices was further supported by inflation and monetary policy. After this period, the price stabilized until 2022, when gold prices began rising again. This increase was caused by the outbreak of war, during which

investors began to prefer gold over equity funds. The war was also accompanied by rising inflation, which especially influenced the increased volatility and rising gold prices (Morina et al., 2024).

When comparing investment tools such as gold and the S&P 500, it becomes evident that global crises, pandemics like COVID-19, or geopolitical conflicts have different impacts on their price developments. Gold is often seen as a hedge against inflation, and investors tend to favour it in times of crisis, as it represents a form of safety. Conversely, during such periods, investors tend to sell off S&P 500 stocks due to their decreasing value. However, investors should remain persistent even in these times, as such assets usually regain value after a certain period.

Based on the summarized data, we analysed the relationship between the selected investment tools using correlation analysis. Specifically, we applied the Pearson correlation coefficient. This analysis investigates the dependency between variables, in this case, the price development of both monitored instruments. The results we obtained are presented in Table 19.

Table 19: Correlation analysis

		S&P500	Gold
S&P500	Pearson Correlation	1	0.513
	Sig. (2-tailed)		0.000
	N	60	60
Gold	Pearson Correlation	0.513	1
	Sig. (2-tailed)	0.000	
	N	60	60

Source: own elaboration

The correlation was calculated based on 2,516 data points representing the development of the gold price and the S&P 500 index from February 2015 to February 2025. We tested the null hypothesis that the correlation coefficient can be considered zero, meaning the variables are linearly independent. This hypothesis was tested at a significance level of 0.05. Given that the p-value of this test is zero (i.e., the p-value is less than the chosen significance level), the null hypothesis is rejected in favour of the alternative hypothesis, which states that the correlation between the variables is non-zero and the variables are linearly dependent. The value of 0.513 for the Pearson correlation coefficient indicates that there is a moderate statistically significant relationship between the variables. The selected investment instruments show a moderate degree of dependence, not a strong one, primarily due to differing reactions to market changes (Keelson et al., 2024). When constructing an investment portfolio, it would be appropriate to include both instruments, particularly to balance risk and return. For investors, this combination could provide stable returns even over the long term.

A comparison of two types of investors shows that investment decision-making is largely determined by the individual's attitude toward risk, investment horizon, and expectations regarding returns and stability (Lee et al., 2015). While a risk-oriented investor tends to favour assets with higher volatility and return potential, a conservative investor prefers instruments that offer lower returns but are less susceptible to market fluctuations. This polarization in preferences translates into completely different investment recommendations, even when evaluating the same financial instruments—for instance, while one investor may find the S&P 500 index attractive due to its returns and liquidity, another may find it less suitable due to the volatility perceived as risky (Omanovic and Zaimovic, 2024). Conversely, gold, as a traditional store of value, may represent a safe haven for a conservative investor but may offer too little growth potential for a more dynamically oriented one.

A general comparison between gold and the S&P 500 index reveals fundamental differences between the two assets in terms of their characteristics, behaviour in various phases of the

economic cycle, and levels of risk and return (Golitsis et al., 2022). Gold has historically been perceived as a safe asset, serving primarily as a protection of wealth during periods of uncertainty, inflation, or geopolitical tension. Its value is less dependent on the performance of individual companies or economic sectors and therefore often functions as a "safe haven" during crises (Gajdosikova and Vojtekova, 2024). On the other hand, the S&P 500 index is a composite indicator of the performance of the 500 largest publicly traded companies in the U.S., reflecting broader economic trends and stock market sentiment. Although its performance is more volatile, it shows a higher average return than gold over the long term, making it an attractive option for investors with a longer investment horizon and a higher tolerance for risk (Rehman et al., 2025).

These differences are also reflected in their correlation, while the S&P 500 is closely tied to cyclical factors, gold tends to move inversely to stock markets during downturns, making it a suitable tool for portfolio diversification. From this, it follows that neither of these assets can be objectively labelled as better or worse, their suitability depends on the investment strategy, macroeconomic outlook, and the personal investment profile of the individual (Dwivedi et al., 2022).

This contrast highlights the importance of personalized investment advice and decision-making, which should not be based solely on objective performance indicators but, above all, on a thorough understanding of the investor's individual profile (Luo et al., 2024). In this context, multi-criteria decision-making methods such as Analytic Hierarchy Process and Technique for Order Preference by Similarity to Ideal Solution appear to be appropriate and effective tools, allowing the consideration of multiple criteria simultaneously and weighting them according to specific investor preferences. Their use not only systematizes the decision-making process but also increases its transparency and repeatability, which is extremely valuable in the context of investment planning (Marciniak and Stanislawski, 2021).

At the same time, this analysis shows that there is no universally best investment, each decision depends on specific circumstances and preferences. For this reason, it is important that investors (whether individuals or institutions) have access to tools that allow them to quantify their expectations and priorities and thus obtain recommendations that are truly tailored. In a time when financial markets are facing constant uncertainty and dynamic changes, the ability to adapt investment strategies to individual needs becomes one of the key advantages in achieving long-term financial success (Ledesma-Chaves and Arenas-Gaitan, 2023).

4. Conclusions

This comparative analysis of gold and the S&P 500 index highlights the fundamentally different roles these two assets play in investment decision-making. While gold is traditionally viewed as a safe haven and a store of value, especially in times of economic uncertainty, the S&P 500 index reflects broader market sentiment and offers higher return potential over the long term—albeit with greater volatility. The moderate but statistically significant correlation between these assets confirms that, despite some level of co-movement, they respond differently to macroeconomic conditions and can thus complement each other in a diversified investment portfolio.

From a theoretical standpoint, the study underscores the importance of aligning investment choices with individual investor profiles, particularly with respect to risk tolerance, investment horizon, and return expectations. It also supports the use of multi-criteria decision-making methods such as AHP and TOPSIS, which enable a systematic and transparent evaluation of investment alternatives based on personalized preferences. This approach bridges traditional

financial analysis with behavioural finance, highlighting the necessity of integrating subjective factors into portfolio construction.

However, the analysis also has certain limitations. It relies on historical data from 2015 to 2025, which may not fully capture future dynamics or structural breaks caused by unforeseen global events. The correlation analysis, while informative, only reveals linear relationships and does not account for potential non-linear dependencies or time-varying interactions between gold and equity markets. Furthermore, investor behaviour was considered in a simplified binary typology (risk-seeking vs. conservative), which may not reflect the full diversity of real-world investor preferences.

Future research could expand on these findings by incorporating non-linear and time-series models (e.g., DCC-GARCH) to examine dynamic correlations over time. Moreover, integrating additional asset classes, such as bonds, cryptocurrencies, or real estate, could provide a more comprehensive view of portfolio diversification strategies. Finally, experimental and behavioural studies that explore how individual investors use tools like AHP or TOPSIS in real decision-making contexts would offer valuable insights into the practical applicability of these methods in financial advisory and planning.

In sum, the comparative analysis confirms that neither gold nor the S&P 500 is universally superior; their utility depends on contextual and personal factors. Therefore, modern investment strategies must emphasize customization, flexibility, and a holistic understanding of both quantitative and qualitative decision-making dimensions.

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