Analysis of Investment Strategies in Developed Markets During Periods of High Volatility (2007–2025)

Master's Degree in Stock Exchange and Financial Markets

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OVERVIEW OF THE INTERNATIONAL FINANCIAL ENVIRONMENT

In the period 2024–2025, financial markets have operated in an environment characterized by high uncertainty, influenced by a series of structural and cyclical factors directly impacting investment decisions:

- **Persistent trade tensions between the United States and China**, affecting global supply chains and economic growth.
- **Escalation of geopolitical conflict**s, notably the confrontation between Israel and Iran, which has generated episodes of risk aversion and volatility in commodity prices.
- **Increased public spending by NATO members**, especially in defense, which could have effects on fiscal deficits and the long-term sustainability of debt.
- **Divergent monetary policies among central banks**, with the Federal Reserve, the ECB, and other actors adopting different paths in response to inflation dynamics and labour market conditions.
- **The yield on the 30-year U.S. Treasury bond reached highs around 4.90%** during the Trump administration in April 2025, reflecting expectations of higher inflation and risk premiums.
- **Acceleration of technological advances — particularly in artificial intelligence** — with disruptive effects on productive sectors and productivity expectations.
- **Recent corrections in equity markets**, resulting from the reassessment of systemic risks, demanding valuations, and macro-financial tensions.

VOLATILITY EVENTS

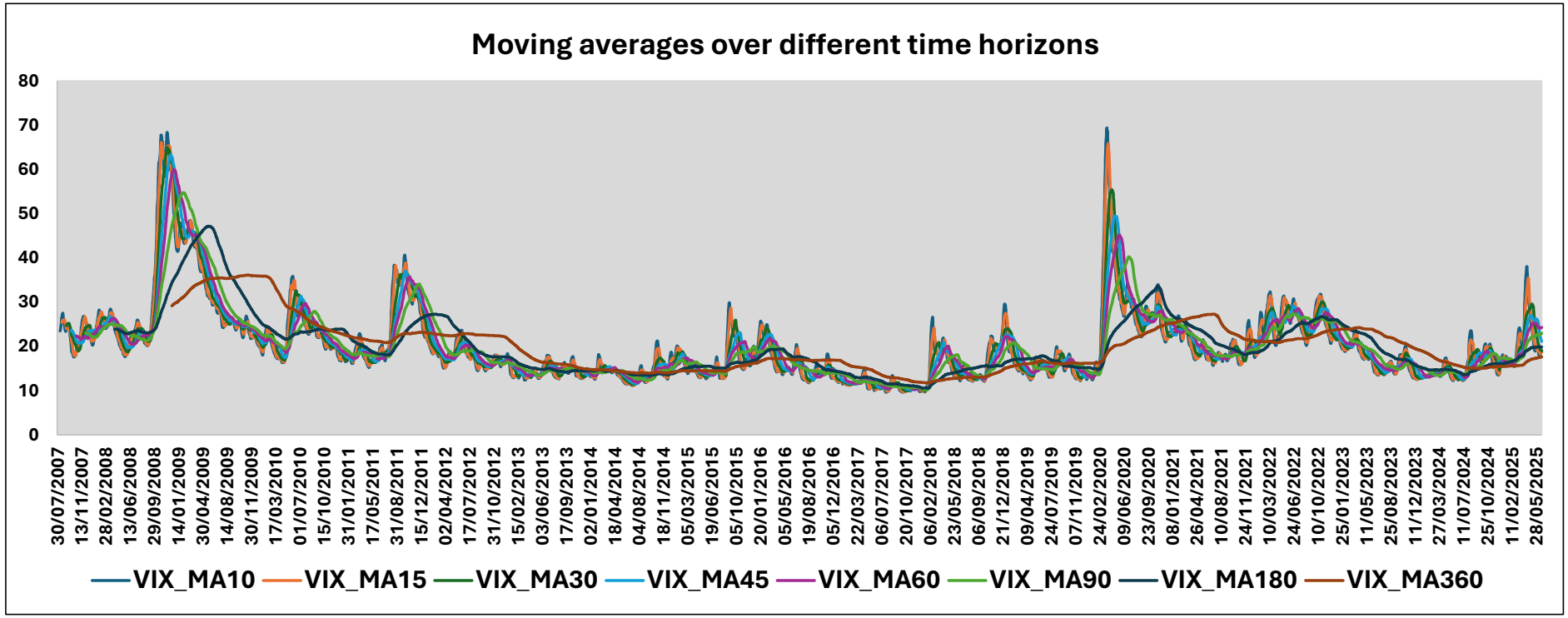
With the aim of identifying high volatility events in the financial market, significant negative movements of the S&P 500 index were analysed along with the corresponding values of the implied volatility index, VIX. For this analysis, only those days where the S&P 500 experienced declines equal to or greater than -2% were considered, reflecting episodes of severe market stress.

The main identified events are detailed below:

- Global Financial Crisis (2008–2009)
- European Sovereign Debt Crisis and U.S. Downgrade (2011)
- China Flash Crash and Emerging Markets Tensions (2015)
- Correction Due to Interest Rate Tensions and Overvaluation (2018)
- COVID-19 Pandemic (2020)
- Recent Events (2024–2025)

HISTORICAL VIX TRENDS AND KEY VOLATILITY EVENTS

During episodes of extreme volatility, such as the 2008 global financial crisis and the 2020 global health crisis, investors' risk expectations increased significantly, driving up implied volatility and resulting in sharp spikes in the VIX. In contrast, during events such as the 2012 sovereign debt crisis, the trade and financial tensions of 2018, or even the most recent crisis between 2022 and 2024, market reactions have been relatively more moderate. This can be explained by a lower perception of systemic risk and, in some cases, by expectations of a favourable resolution to conflicts — as occurred following the onset of the war between Russia and Ukraine, when part of the market priced in potential peace agreements. This "peace discount" tends to create a positive bias in valuations, reducing perceived risk and temporarily stabilizing the prices of assets linked to global benchmark indices such as the S&P 500.



Source: Author's own work using data from Yahoo Finance (2025)

GENERAL AND SPECIFIC OBJECTIVES

The following objectives are proposed:

- **General Objective:**

1. Analyse the extent to which, and the manner in which, market volatility influences investment strategies in developed markets, identifying behavioural patterns across different asset classes during periods of high financial volatility.

- **Specific Objectives:**

1. Identify the main characteristics of volatility in developed markets and its evolution during episodes of high financial uncertainty.
2. Examine the behaviour of equity indices, commodities (gold and oil), and sovereign bonds during periods of elevated volatility.
3. Analyse capital rotation between equities, safe-haven assets, and strategic assets in volatile market environments.
4. Explain the importance of volatility as a key variable in investment decision-making for portfolio allocation and protection.
5. Evaluate the relationship between the VIX index, financial system liquidity, and the investment strategies adopted.

HYPOTHESES

In response to the research objectives, the following hypotheses are proposed:

- **General Hypothesis:**

1. Market volatility significantly influences investment strategies in developed markets, generating asset reallocation patterns that impact different classes such as equities, commodities, and sovereign bonds during periods of high financial uncertainty.

- **Specific Hypotheses:**

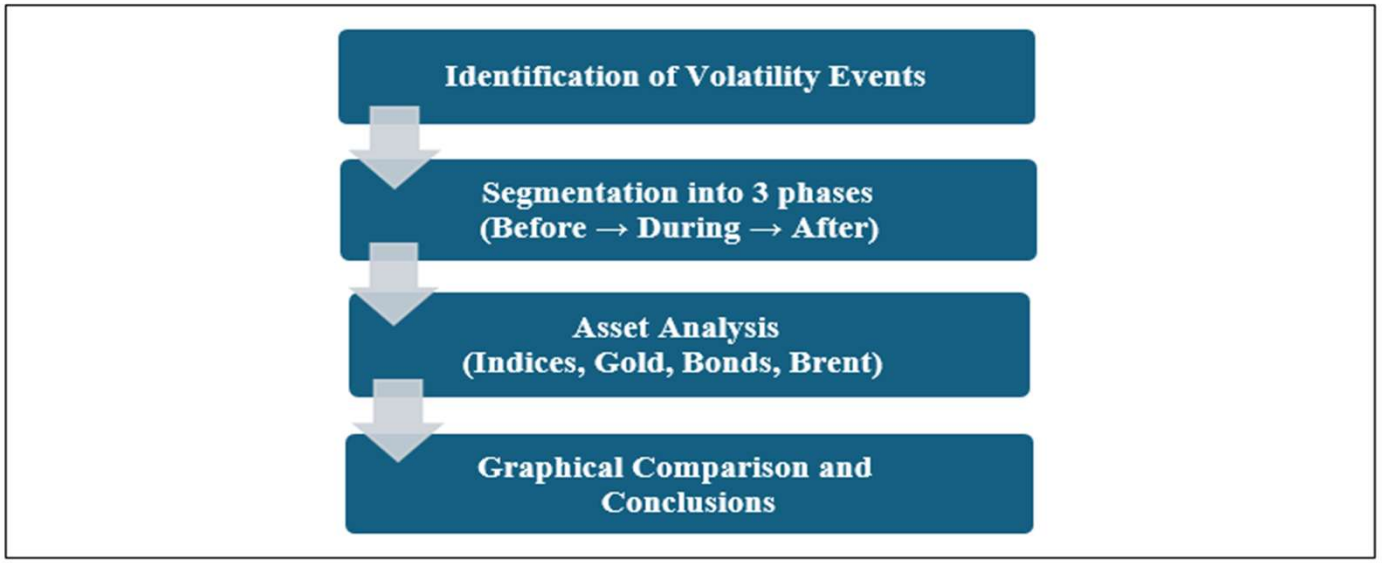
1. During periods of financial stress, volatility in developed markets increases sharply and displays distinctive features that can be identified and quantified.
2. Stock indices in developed economies react negatively to episodes of elevated volatility, exhibiting significant declines and greater price fluctuations.
3. In times of high volatility, there is a capital rotation that favours the shift from equities to safe-haven assets such as gold and sovereign bonds.
4. Safe-haven assets exhibit defensive behaviour and increased demand in response to rising market volatility.
5. There is a direct relationship between the VIX index, financial system liquidity, and asset reallocation strategies aimed at mitigating risk during high-volatility episodes.

METHODOLOGY

This study adopts a quantitative approach based on time series analysis, aiming to assess the impact of volatility on investment strategies. Daily data from various financial assets between 2007 and 2025 were used, applying graphical and statistical analysis techniques. Key episodes of high volatility were identified, and the behaviour of assets was compared before, during, and after each event.

All analysis was automated through Python scripts, enabling the generation of visualizations and the measurement of the market's dynamic response. Finally, methodological limitations are acknowledged, such as the indirect inference of capital flows based on asset prices.

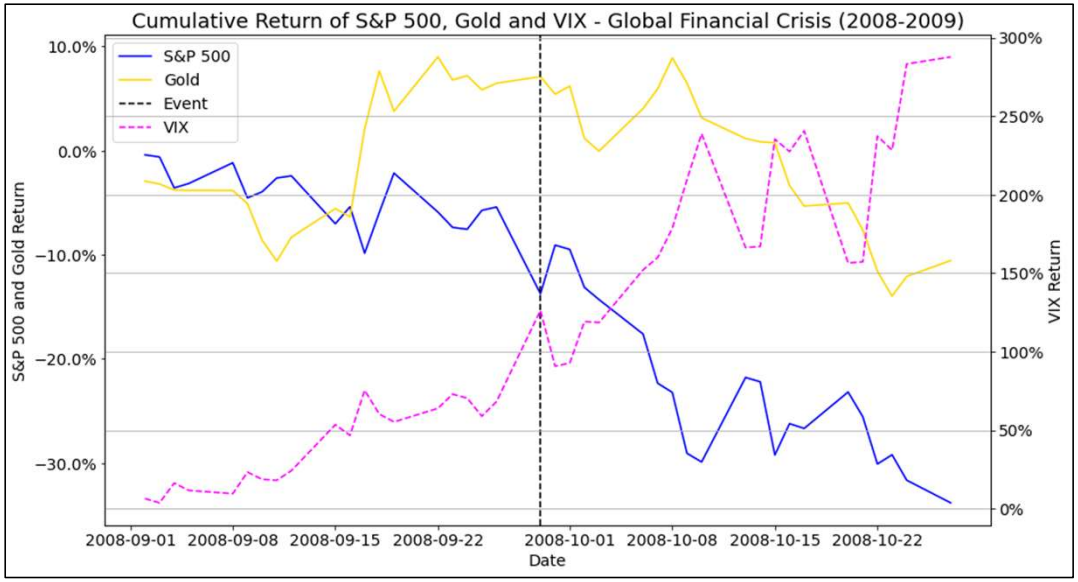
Figure 1 – Applied Methodology for Market Volatility Assessment

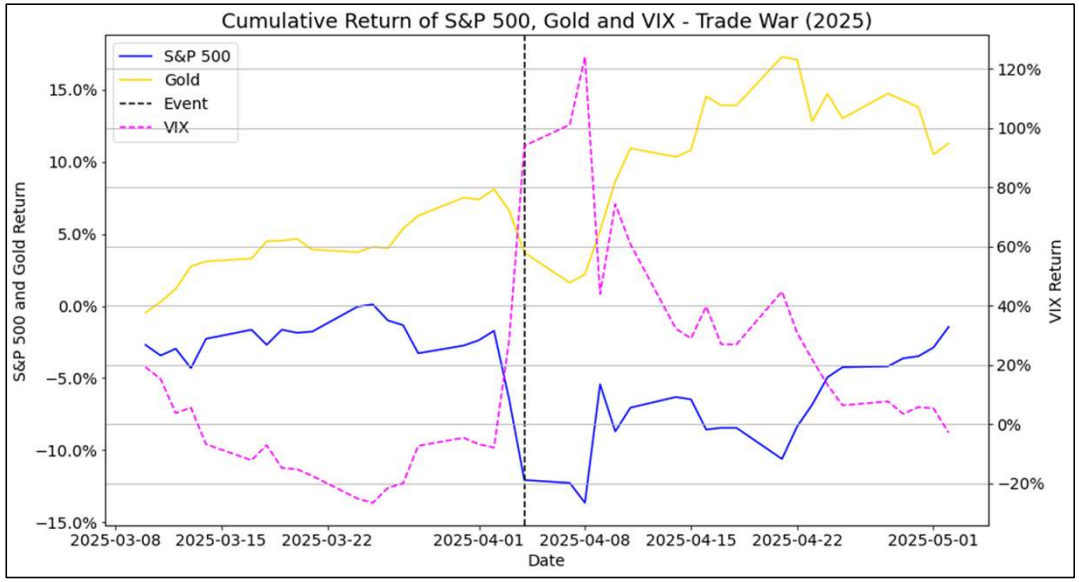


Source: Author's own work

ROTATION INTO SAFE-HAVEN ASSETS

This section analyses the performance of gold during different periods of financial crisis to assess its role as a safe-haven asset. Based on cumulative return and price evolution charts before, during, and after these events, the objective is to determine whether gold preserves its value or even enhances its performance during times of heightened volatility and economic stress.

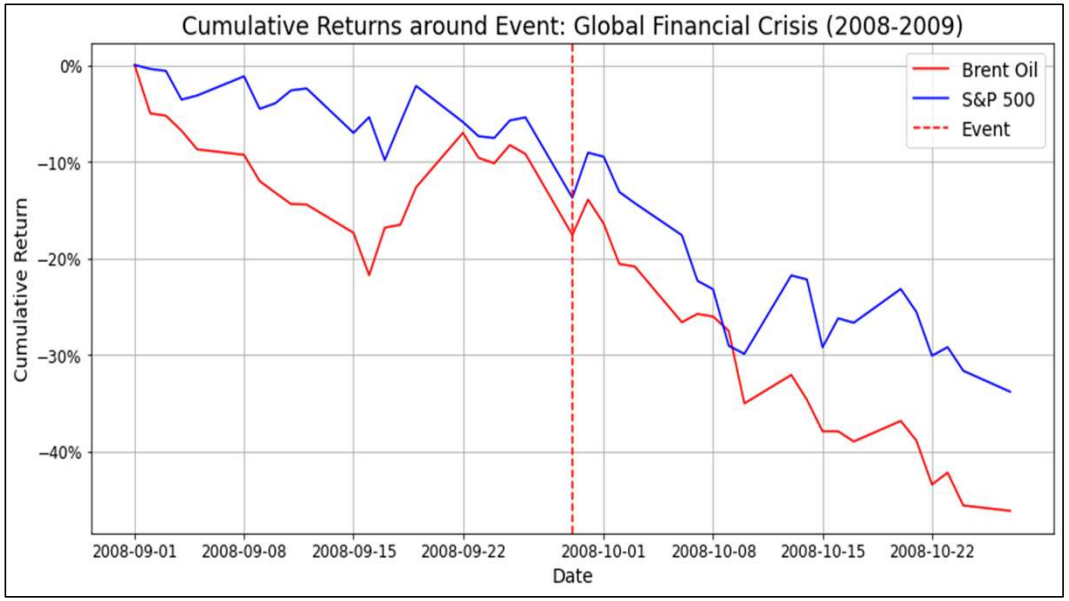


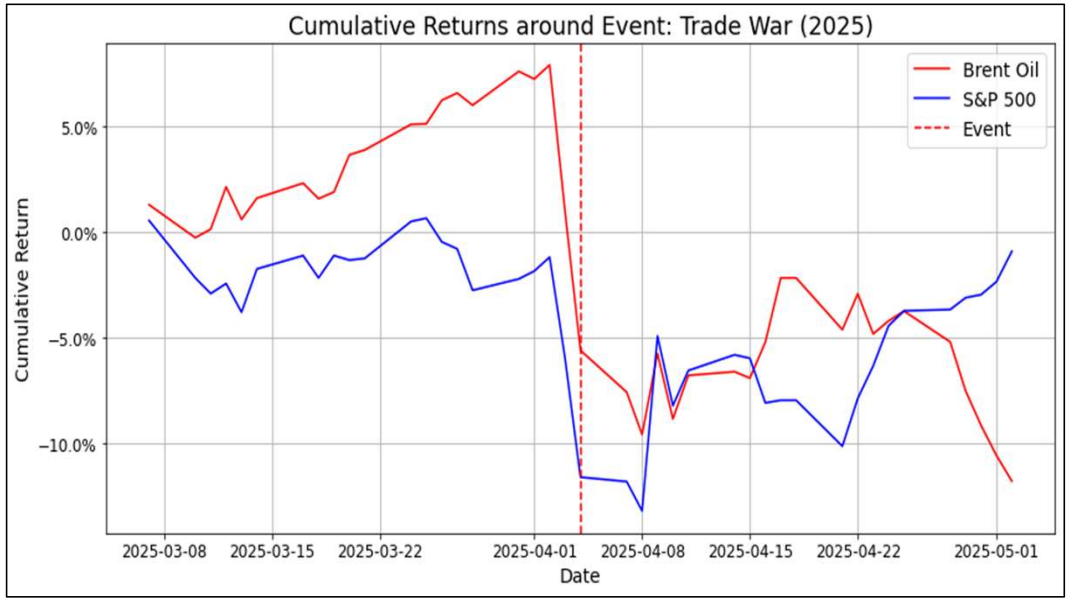


Source: Author's own work using data from Yahoo Finance (2025)

BRENT CRUDE SENSITIVITY

In most of the crises analysed, Brent crude prices experienced sharper declines than the S&P 500 index, indicating that oil tends to react more strongly to economic or market shocks. This greater sensitivity may be attributed to its strong link to global energy demand, which contracts rapidly during periods of uncertainty.

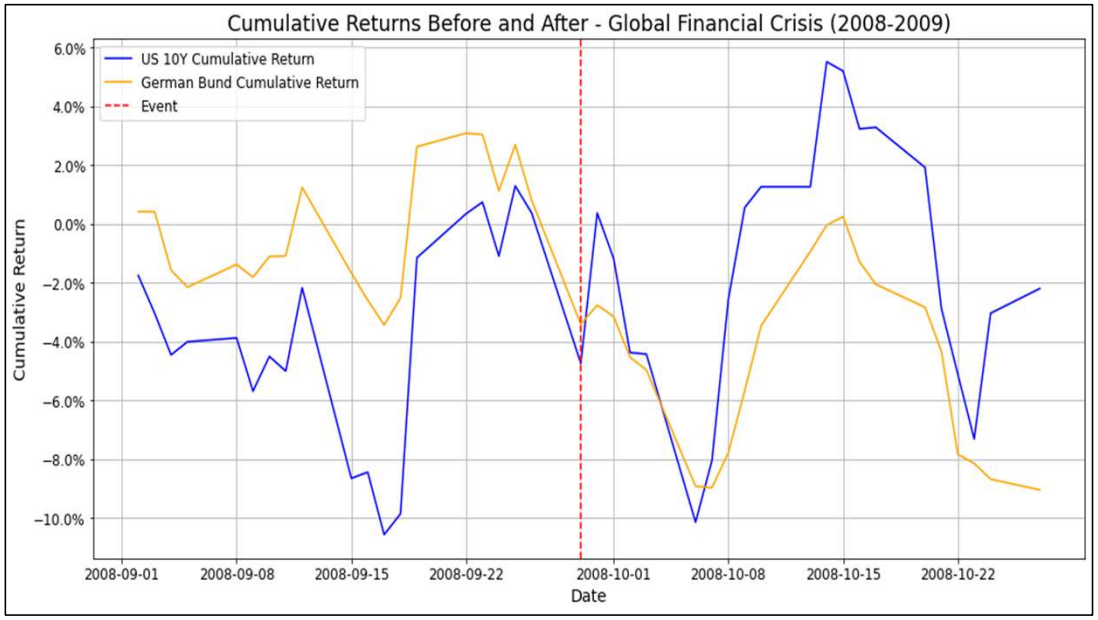


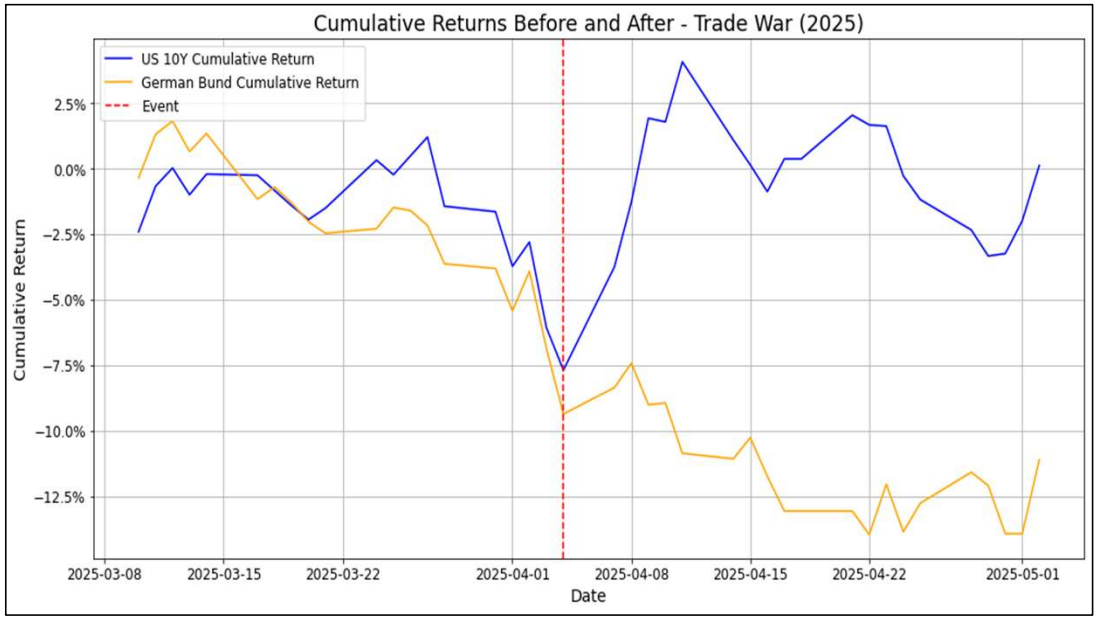


Source: Author's own work using data from Yahoo Finance (2025)

SOVEREIGN BOND REACTION

During the periods of high volatility analysed, 10-year sovereign bonds, primarily represented by the German Bund and the US Treasury, have exhibited typical safe-haven asset behaviour, albeit with nuances depending on the macroeconomic context and the nature of each crisis.





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STRATEGIC IMPLICATIONS OF THE EMPIRICAL ANALYSIS

This section synthesizes the previous findings to propose practical recommendations for portfolio management during periods of high volatility, focusing on how to adapt asset allocation to mitigate risks and seize opportunities.

- **Confirmation of the "flight to quality":** During each episode of high volatility (2008, 2011, 2015, 2018, 2020, and 2025), a clear rotation towards safe-haven assets was observed, especially gold and 10-year sovereign bonds (U.S. and Germany).
- **Use of the VIX as a forecasting tool:** The VIX index and its moving averages allow for the detection of sustained stress regimes. It serves as an early warning signal to adjust portfolios accordingly.
- **Strategic role of gold:** Its capacity as a defensive asset was confirmed, showing stable or increasing returns during critical periods.
- **Sovereign bonds as a cornerstone in risk management:** Demand for bonds increases during times of uncertainty, reinforcing their role as instruments for hedging and capital preservation.
- **Brent as a macroeconomic indicator:** Although not a safe haven, Brent crude oil exhibited declines preceding market deterioration, serving as a leading indicator of the economic cycle.
- **Application in institutional portfolios:** These findings enable the design of more reactive and defensive strategies by combining safe-haven assets with volatility monitoring and macroeconomic signals.

RESEARCH LIMITATIONS

- **Indirect inference of capital flows:** These are not observed directly; they are estimated from prices and returns.
- **Temporal horizon limited to specific historical events:** Although broad (2007–2025), results may depend on the context of each crisis.
- **Focus limited to selected assets:** Assets such as currencies, cryptocurrencies, or individual stocks were not included.
- **Non-econometric modelling:** The analysis is primarily descriptive and graphical; advanced econometric models were not used.
- **Focus on developed markets:** Emerging markets are not considered, which may respond differently to volatility.

CONCLUSIONS

The following conclusions are presented:

- **Volatility conditions asset allocation:** It was confirmed that investors adjust their portfolios in contexts of high uncertainty, favouring defensive assets.
- **The "flight to quality" phenomenon is confirmed:** In each episode of volatility (2008, 2011, 2015, 2018, 2020, and 2025), a clear rotation was observed from equities to gold and sovereign bonds (U.S. and Germany).
- **The VIX index is a useful leading indicator:** Its analysis using moving averages allowed identification of both acute events and prolonged periods of financial stress.
- **Gold and bonds consistently fulfil their safe-haven role:** They maintain or increase their value in most of the crises studied, positioning them as key assets in portfolio management.
- **Brent crude does not act as a safe haven, but as a leading signal:** In several events, it declines before the indices, making it useful to anticipate macroeconomic tensions.
- **The results empirically validate the proposed hypotheses:** It is demonstrated that volatility significantly influences investment strategies, both in magnitude and direction.
- **The study provides practical tools for decision-making:** The implications are applicable to institutional managers and dynamic asset allocation strategies.