## **Evaluating Gold's Safe Haven Properties in MENA Equity Markets**

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Abstract: This study investigates the relationship between gold and equity markets during periods of market instability, focusing on the hedging and safe haven properties of gold over the past 17 years (2006 to 2023). The study contributes to the existing literature by revisiting the safe haven theory and testing it within the Middle East and North Africa (MENA) region using the DCC-GARCH, while also examining the properties of gold under two major crises: the Global Financial Crisis (GFC) and the COVID-19 pandemic. The methodology is divided into two stages: the first examines the overall relationship between gold and equity markets throughout the entire sample period, while the second focuses on the distinct crises to determine whether gold's properties differ between them. The results from the DCC-GARCH models reveal significant variations in gold's properties across different countries and crises. On average, gold is classified as a safe haven asset in all examined markets during the GFC. However, its safe haven characteristics were not uniformly observed during the Covid-19. Overall, the analysis concluded that gold typically acts as a weak safe haven asset across the region, except for Qatar, where its protective qualities were stronger. This study contributes to the understanding of gold's role in financial markets, particularly in the context of the MENA region, and provides valuable insights for investors and policymakers navigating periods of economic uncertainty.

### Keywords: Safe Haven, Gold, MENA Region, Global Financial Crises, Covid-19 Pandemic

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### Introduction

During the past three decades, from 1990 to 2023, the financial market has experienced numerous instances of recessions, bubbles, and financial crises that have significantly impacted its stability. For instance, the 2008 GFC resulted in the total collapse of the global financial infrastructure, plunging the world into chaos. Although the crisis was significant, the subsequent Covid-19 pandemic introduced a new level of chaos. Yao et al. (2023) revealed a statistically significant relationship between infection rates and increased financial stress. The United States, being one of the biggest countries that was severely impacted during the pandemic, demonstrated considerable spillover effects on other nations (Yao, Li, Shang, Le, & Li, 2023). The pandemic caused significant fluctuations in stock markets, resulting in heightened economic policy uncertainty and volatility levels compared to those observed during the GFC. These events highlight the integration of global financial systems and the profound effects that crises can have on overall market stability \_(Sharif, Aloui, & Yarovaya, 2020).

Given the significant impact that previous crises have had on the economy and financial markets, it is imperative for investors to protect their investments from the risks associated with potential crises. Notably, previous research conducted by Baur and Lucey (2010), Baur and McDermott (2010), and Reboredo (2013) has focused on the challenges of preserving wealth during financial crises and has identified gold as a historical safe haven asset. A safe haven asset refers to an asset that exhibits either no correlation or a negative correlation with other assets or portfolios, particularly during times of crisis and extreme market conditions (Yunus, 2020). Consequently, investing in a safe haven asset provides a shield for investors, as its value tends to increase while the values of other assets or portfolios decline (Baur & Lucey, 2010).

Nevertheless, Since the GFC, there has been a renewed focus on understanding how different asset classes and sectors are connected globally and within specific countries. Some research suggests that these connections have grown stronger over time, especially post-crisis, reducing the benefits of diversification (Baur & Lucey, 2009; Dooley & Hutchison, 2009; Alexakis, 2010; Aloui, Assa, & Nguyen, 2011; Yunus, 2016). Various crises such as the US subprime mortgage crisis, the GFC, the European debt crisis, the oil market crash, the China-US trade tensions, and the increased financial market integration have pushed investors to look for assets that do not move in sync with stocks. Precious metals, particularly gold, have caught the attention of investors and fund managers as a way to hedge against stock market risks.

The concepts of safe haven and hedging have been recognized for centuries; however, empirical testing of these characteristics is relatively recent. Baur and

Lucey (2010) were among the first to investigate whether gold, often regarded as a safe haven asset, truly possessed these qualities. Their analysis confirmed that gold acts as a safe haven during extreme market conditions while serving as a hedge under normal circumstances. Notably, they found that gold provides both hedging and safe haven benefits for equities but does not exhibit these characteristics for bonds in the United States.

However, the existing literature, as highlighted by <u>Mensi et al. (2023)</u>, tends to focus on developed and major emerging markets, including analyses of gold's hedging capabilities in United states \_(Abid, Dhaoui, Goutte, & Guesmi, 2020; Burdekin & Tao, 2021; Konstantakis, Xidonas, Michaelides, & Goutte, 2023), United Kingdom \_(He, O'Connor, & Thijssen, 2018), European Countries \_(Ji, Zhang, & Zhao, 2020; Cheema, Faff, & Szulczyk, 2022; Belhassine & Riahi, 2024), and China \_(Wen, Tong, & Ren, 2022). In contrast, research concerning gold's role in MENA stock markets remain limited.

MENA markets have experienced significant turbulence over the past decade, characterized by geopolitical changes such as Arab Spring and various conflicts. These events have led to structural reforms and fluctuations in foreign direct investment (FDI). Interestingly, portfolio inflows to MENA stock markets have risen to reach 20% of the total portfolio investments in emerging markets \_(Mensi, Maitra, Selmi, & Vo, 2023). Moreover, gold consumption in MENA is notably higher per capita than the global average, despite major consuming countries like the US, India, and China having lower per capita consumption rates \_(Mensi, Maitra, Selmi, & Vo, 2023). Therefore, examining gold's role for MENA stock investors is both relevant and urgent, as it addresses a significant gap in the existing literature and reflects the unique economic circumstances of the region.

Additionally, the existing literature indicates that gold's effectiveness as a safe haven asset exhibits significant variability across different contexts and crises. While gold demonstrated strong safe haven properties during GFC \_(Baur & McDermott, 2013; Burdekin & Tao, 2021), its performance during the Covid-19 pandemic was less consistent \_(Burdekin & Tao, 2021; Cheema, Faff, & Szulczyk, 2022). Nevertheless, the existing literature lacks comparability between crises, making it challenging to investigate whether the properties of gold differ from one crisis to another or not.

This study aims to analyze the safe haven characteristics of gold during crises in MENA region equity markets. Additionally, the study will explore whether gold demonstrates consistent safe haven properties across different countries within the MENA region. It will also investigate whether the safe haven characteristics of gold vary during different types of crises. To achieve these objectives, the research seeks to answer the following questions:

1. Does gold exhibit safe haven properties during periods of market turmoil?

- 2. Are the properties of gold consistent across different countries in the MENA region?
- 3. Does gold maintain consistent properties across various crises in the MENA region?

# Literature Review

A substantial body of academic research has been dedicated to exploring the relationship between gold and stocks. Gold is recognized as a significant financial asset that possesses distinctive characteristics compared to other precious metals. Numerous studies have investigated the correlation between gold and stocks, as well as the potential role of gold as a hedge or safe haven.

<u>Boubaker et al. (2020)</u> examined gold's safe haven attributes following global crises using annual data. They were able to provide solid evidence that gold acts as a strong buffer against crises under certain situations, most notably during the bull market regime and, more specifically, during World War I. <u>Abid et al. (2020)</u> examined the dynamic conditional correlation between the US equity market and a comprehensive range of commodity prices and risk factors in order to forecast the transmission of shocks to the equity markets. Their empirical investigation reveals that gold demonstrates superior hedging capabilities for the US equity market over an extended period, surpassing the effectiveness of oil and bonds, while also exhibiting characteristics of a safe haven asset. These advantageous attributes may also extend to providing protection against currency fluctuations (Burdekin & Tao, 2021).

During the period of the Covid-19 pandemic, a multitude of scholarly investigations have surfaced with the objective of exploring the safe haven characteristics exhibited by diverse assets. According to Salisu et al. (2021), early studies conducted at the beginning of the pandemic outbreak failed to confirm the assertion that gold acted as a safe haven. Burdekin and Tao (2021) were able to support such claim by investigating the effectiveness of gold and gold mining stocks in hedging American stocks during Covid-19 and the 2008 GFC using dynamic conditional correlations and hedge ratios. Their analysis revealed that gold had a significant hedging value during GFC but did not sustain such quality during the pandemic. <u>Cheema et al. (2022)</u> also undertook a comparative analysis including the ten largest economies in the world (United States, China, Japan, Germany, United Kingdom, France, India, Italy, Brazil, & Canada) and various safe-haven assets during both the Covid-19 crisis and the 2008 GFC. Their empirical findings suggested that the two crises were significantly different, as investors' behavior exhibited significant variations between the two periods. Nonetheless, their analysis indicated that silver and gold could lose their safe

haven status during a pandemic.

On the contrary, <u>Ji, Zhang, and Zhao (2020)</u> attempted to re-examine the safe haven characteristics of gold, cryptocurrency, foreign exchange, and commodities against the American, Chinese and European stock markets. Their findings indicated that safe haven becomes less effective for the majority of the considered assets, except for gold and soybean commodity future as they remained robust safe haven assets during Covid-19 crisis. Moreover, <u>Konstantinos et al. (2023)</u> used pertinent analytical techniques and a dynamic Markov-Switching Regression (MSR) model to investigate whether gold became the ultimate safe haven throughout the two waves of the pandemic. Their results show that gold displays safe haven characteristics against bonds during both waves of the pandemic. On the other hand, gold's safe haven characteristics' significance has slightly changed in relation to stocks. Gold was found to be negatively correlated to US stock returns; thus, it is considered a diversifier for stocks.

Furthermore, <u>Pastén-Henríquez et al. (2025)</u> examined the safe haven properties of various assets, with a particular focus on cryptocurrencies and gold, during the Russian Ukraine and Palestine-Israel conflicts. Conducted in the context of the US, the research employs DCC-GARCH and event study methodologies to assess the behavior of these assets during periods of geopolitical instability. Notably, traditional assets such as gold consistently emerged as stable refuges during these crises, reinforcing their role as reliable safe-haven investments.

The discussed literature primarily examines efficient markets in developing economies, but the MENA region, which is the focus of this study, is characterized by significant inefficiencies. These inefficiencies can create substantial challenges, not only impacting investment strategies but also distorting price signals that hinder effective resource allocation. In developing markets like those in the MENA region, such inefficiencies often lead to increased volatility, underscoring the urgent need for safe-haven assets to mitigate associated risks (Lekhal & Oubani, 2020).

In this context, <u>Mensiet al. (2023)</u> utilized the copula-quantile-on-quantile and conditional value at risk methods to examine whether gold exhibits characteristics of a hedge or a safe haven in the MENA region. Their findings present compelling evidence of quantile dependence between gold and stock returns. Specifically, positive correlations were identified between MENA gold and stock markets during bullish market conditions. Conversely, negative correlations were observed between gold markets and MENA stock markets when stock returns were bearish. Notably, the risk spillover from gold to stock markets intensified during the GFC and European crises. However, this study failed to include covid-19 and Russian-Ukrainian war which represent two major events that might affect the findings of

the study.

Moreover, <u>Chkili (2024)</u> conducted a comprehensive analysis of the interactions between three precious metals (gold, palladium, and platinum) and Bitcoin in relation to MENA equity markets during the Covid-19 pandemic. Utilizing the DCC-GARCH model, the study examined data from ten MENA stock markets, three precious metals, and Bitcoin. The results indicated that the risks associated with Covid-19 were transmitted to MENA stock markets through volatility spillovers among these markets. Notably, gold maintained its traditional role as a safe haven asset for the MENA stock market throughout the pandemic, while Bitcoin did not exhibit similar safe haven characteristics. This distinction underscores the enduring significance of gold in times of economic uncertainty, contrasting with the more speculative nature of cryptocurrencies like Bitcoin. However, while this study significantly contributes to existing literature, it is limited in scope, focusing exclusively on the Covid-19 pandemic and neglecting other crises and time frames that may yield different insights.

## Methodology

The analysis will rely on Generalized Auto-Regressive Conditional Heteroskedasticity (GARCH) regression model. The selection of this model is supported by several key considerations. Firstly, the GARCH model is widely recognized and utilized in the field of financial market analysis. Specifically, the DCC-GARCH model have been employed in numerous studies to explore the dynamic relationships among commodities, cryptocurrencies, and financial markets \_(Abid, Dhaoui, Goutte, & Guesmi, 2020; Burdekin & Tao, 2021; Belhassine & Riahi, 2024; Chkili, 2024).

Secondly, the DCC-GARCH model is particularly suited to meet our research objectives as it illustrates the dynamic conditional correlations among the assets throughout the entire sampled period. This analysis helps to identify the period of both low and high correlations. Based on these results, one can determine whether gold functions as safe haven during times of extreme market volatility.

This study builds upon the foundational work of <u>Baur and Lucey (2010)</u> to investigate whether gold can serve as a safe haven or hedge for MENA stock markets. Their methodology immediately gained popularity and have been widely adopted in various studies \_(Liu, Naeem, Rehman, Farid, & Shahzad, 2020; Liu W.-h. , 2020; Lucey & Li, 2015; Li & Lucey, 2017).

<u>Baur and Lucey (2010)</u> provided precise definitions for the concepts of diversifier, hedge, and safe haven. An asset is classified as a diversifier if it exhibits a positive but weak average correlation with another asset or portfolio. Conversely, an asset

is considered a hedge if it has little to no correlation with another asset or portfolio. They defined safe haven assets as an asset that demonstrate negative or no correlation with another asset or portfolio particularly during periods of market stress or economic turmoil.

To assess the safe haven properties of assets, <u>Baur and Lucey (2010)</u> recommend using the following equation:

$$r_{Gold, t} = a_0 + b_1 r_{Stock, t} + b_2 r_{Stock, t(q)} + \varepsilon_t$$
[1]

Where  $r_{(y, t)}$  is the returns of potential safe haven assets (Gold),  $r_{(Stock, t)}$  is the returns of stock market index, and  $r_{(Stock, t(q))}$  account for asymmetries of positive and negative (extreme) shocks included to focus on bearish stock markets. The safe haven assets will be analyzed in times of stress or extreme stock market situations using  $r_{(Stock, t(q))}$  variable.  $r_{(Stock, t(q))}$  contains stock returns that are in the 5%, 2.5%, and 1% lower quantile (Baur and Lucey, 2010). If the stock market returns are larger than the q% quantile, the value of  $r_{(Stock, t(q))}$  is zero.

If the constant  $b_1$  in the above model is weakly positive, the gold is a weak diversifier against movements in the stock markets. Gold is a hedge against fluctuations in the stock markets if  $b_1$  is statistically not different from zero (indicating a weak hedge) or negative (indicating a strong hedge). During a crisis period, gold is considered a weak safe haven for the stock markets if  $b_2$  is not significantly different from zero, or a strong safe haven if  $b_2$  is significantly negative (Baur & Lucey, 2010).

### Data & Preliminary Analysis

The dataset utilized in this study comprises of the weekly international prices of gold (\$ per ounce) and the weekly closing prices of five different MENA stock market indices. The countries analyzed in the study encompass *Bahrain, Egypt, Qatar, Saudi Arabia, & United Arab Emirates (UAE)*. The selection of these markets was guided by specific criteria aimed at ensuring the robustness and reliability of the analysis.

The first criteria for choosing these markets is the availability of data from 2006 to 2023, which allows for a comprehensive examination of gold's safe haven characteristics over a significant period. This timeframe is crucial for capturing various economic conditions and crises that may influence market behavior. Additionally, by focusing on the largest markets in the MENA region, we aim to minimize high noise in the data, which can arise from smaller, less liquid markets. Larger markets tend to exhibit more stable and efficient pricing mechanisms

(Mallikarjunappa, Saldanha, & Hawaldar, 2025), making them more suitable for this type of analysis.

All data was retrieved from the LSEG Database, covering the period from January 1<sup>st</sup>, 2006, to December 31<sup>st</sup>, 2023. The 17-year period was selected to include both stable and financially turbulent years. The decision to utilize weekly data stemmed from previous studies indicating that daily or medium-horizon data yield more reliable and efficient results for financial analysis in both emerging and developing markets (Kumar & Padakandla, 2022; Fabris & Jesic, 2023).

Consequently, each asset's dataset consists of approximately 939 weekly observations. All index data was retrieved in the respective local currencies of the indices, thus to ensure comparable, <u>Baur & Mc Dermott (2010)</u> and <u>Baur & Laucy (2010)</u> approaches were followed where all indices' prices were converted into weekly returns.

**Figure 1.** displays the time progression of international gold prices and MENA stock indices. The graphs illustrate an overall upward movement in all stock markets from 2006 to 2008. However, a significant downturn is evident in 2008 as a result of the GFC, impacting the performance of these markets.

Furthermore, all the stock markets witness another decline in 2020, attributed to the widespread impact of the Covid-19 pandemic on MENA region equity markets. In contrast, gold prices exhibited a consistent upward trend throughout the period from 2006 to 2023. This steady increase in gold prices implies that gold might be considered as a safe haven asset during times of economic uncertainty and market volatility.



Figure 1. Time evolution of MENA stock indices and international gold prices (\$/ounce). The X-axis (Y-axis) indicates time and index or price level (\$/ounce).

	-				=	=
	Bahrain	Egypt	Qatar	Saudi Arabia	UAE	Gold
Observati ons	939	931	933	926	937	939
Mean	-0.002%	0.22%	0.04%	0.02%	-0.005%	0.18%
Max	4.87%	21.31%	12.73%	14.75%	14.54%	15.83%
Min	-11.21%	-19.71%	-20.53%	-21.21%	-24.72%	-12.88%
S. Dev.	1.39%	3.94%	3.01%	3.33%	3.44%	2.50%
Skewness	-1.13	-0.438	-0.65	-1.00	-1.08	-0.15
Kurtosis	7.39	4.488	5.89	6.04	7.06	3.49
Correlati on	-0.0053*	-0.0136**	-0.0075*	- 0.0787***	-0.0173**	-

 Table 1. Descriptive Statistics for the whole sample period [2006 – 2023]

**Table 1.** presents a summary of descriptive statistics of MENA stock market returns over the whole sample period. The results reveal that the average returns are positive for all stock markets except Bahrain and UAE; Egypt exhibits the highest returns, followed by Qatar and Saudi Arabia stock markets. Gold price returns trail behind those of Egypt and attain the second highest average weekly returns. The negative skewness was observed for gold and all stock markets. Consequently, investors may expect frequent small gains with a few large losses in these cases. The higher kurtosis values observed for all stock markets and gold suggest the presence of fat tails in the distribution of returns; this implies that extreme events (both positive and negative) are more likely to occur than would be expected in a normal distribution. This finding underlines the need for investors to be prepared for potentially significant gains or losses in these markets.

The correlation coefficients for the whole sampled period (from 2006 to 2023). All correlations are statistically significant, revealing that all stock markets in the MENA region exhibit a negative relationship with gold prices. The correlation coefficients generally range from -0.1 to +0.1, indicating that the relationships between these variables are very weak. Such weak correlations suggest that while some investors may consider gold as a hedge against stock market volatility, the effectiveness of this strategy may vary considerably across different markets in the region.

# **Results & Discussion**

**Table 2.** presents the results derived from the empirical models. The coefficient estimates for the average effect of stock returns on gold prices is -0.0604 for Bahrain, 0.0984 for Egypt, -0.0163 for Qatar, 0.0126 for Saudi Arabia, and -0.0164 for UAE. Notably, all estimates are statistically significant at the 5% significance level. These estimates suggest that gold functions as a hedge against stock performance in Bahrain, Qatar, and UAE; conversely, this relationship does not hold for Egypt and Saudi Arabia as gold is considered as a weak diversifier.

When examining extreme negative stock returns, the coefficient estimates at the 5% quantile are positive for Egypt, Bahrain, and Qatar, indicating that gold did not fulfill its role as a safe haven asset in these markets. In contrast, both Saudi Arabia and UAE exhibit negative coefficient estimate at the 5% quantile, suggesting that gold acted as a strong safe haven asset during extreme downturns, as evidenced by significantly negative values. This differentiation indicates that, while gold may not provide protection during moderate stock declines in certain markets, it can serve as a refuge in other markets.

Turning to the more severe quantiles of 2.5% and 1%, the coefficient estimates were significantly negative across all markets. This consistent result implies that gold generally acts as a safe haven asset during periods of severe stock market distress. The overall effect of any quantile is determined by summing all coefficient estimates associated with stock returns up to the specified quantile. For instance, the overall effect for the 1% quantile yields values of -0.085 for Bahrain, -0.045 for Egypt, -0.032 for Qatar, -0.024 for Saudi Arabia, and -0.288 for UAE. These results indicate that, during instance of extreme negative stock returns at 1% quantile, gold prices show a weak increase in all markets except for the UAE, where gold prices rise significantly.

Consequently, the results indicate that gold serves as a weak safe haven asset in all markets examined, except in the UAE, where it is classified as a strong safe haven asset due to an overall coefficient exceeding -0.1. In contrast, the overall coefficient values in the other markets are lower than -0.1, reflecting a weaker correlation. This discrepancy underscores the notion that, while gold may provide some level of protection against market downturns, it functions primarily as a weak safe haven asset in Bahrain, Egypt, Qatar, and Saudi Arabia.Furthermore, the Fact that the sum of coefficient estimates is non positive for the 2.5% and 1% quantile yet positive for the 5% quantile in Bahrain, Egypt, and Qatar suggests that gold serves as a safe haven only in the context of shocks exceeding the 2.5% and 1% quantile.

Dependent					
Variable:	Gold_R	Sample:	1/1/2006 - 12/31/2023		
Method:	DCC GARCH	Included Observations:	939		
	Bahrain (Bah	rain All Share Index)			
Variable	Coefficient	Standard Error	P-Value		
<i>b</i> <sub>1</sub>	-0.0604	0.0627	0.0335**		
b <sub>2</sub> (5%)	0.0129	0.0016	0.000***		
b <sub>2</sub> (2.5%)	0.0218	0.0085	0.000***		
b <sub>2</sub> (1%)	-0.0592	0.0021	0.000***		
Prob > F:	0.000***	<b>Durbin Watson:</b>	2.0364		
Egypt (EGX 30)					
Variable	Coefficient	Standard Error	P-Value		
<i>b</i> <sub>1</sub>	0.0984	0.0293	0.001***		
b <sub>2</sub> (5%)	0.0052	0.0027	0.054*		
b <sub>2</sub> (2.5%)	-0.1265	0.0015	0.000***		
b <sub>2</sub> (1%)	-0.0221	0.0009	0.000***		
Prob > F:	0.000***	Durbin Watson:	2.3594		
Qatar (QE General Index - QSI)					
Variable	Coefficient	Standard Error	P-Value		
<i>b</i> <sub>1</sub>	-0.0163	0.0132	0.042**		
b <sub>2</sub> (5%)	0.0005	0.0003	0.005**		
b <sub>2</sub> (2.5%)	-0.0055	0.0028	0.000***		
b <sub>2</sub> (1%)	-0.0102	0.0167	0.000***		
Prob > F:	0.0217**	<b>Durbin Watson:</b>	2.1252		
Saudi Arabia (MSCI Tadwul 30)					
Variable	Coefficient	Standard Error	P-Value		
<i>b</i> <sub>1</sub>	0.0126	0.0252	0.041**		
b <sub>2</sub> (5%)	-0.0012	0.0141	0.043**		
b <sub>2</sub> (2.5%)	-0.0131	0.0015	0.000***		
b <sub>2</sub> (1%)	-0.0219	0.0008	0.000***		
Prob > F:	0.0008***	Durbin Watson:	2.0280		
United Arab Emirates (DFM General Index)					
Variable	Coefficient	Standard Error	P-Value		
$b_1$	-0.0164	0.0239	0.049**		
b <sub>2</sub> (5%)	-0.0411	0.0240	0.087*		
b <sub>2</sub> (2.5%)	-0.0131	0.0015	0.000***		
b <sub>2</sub> (1%)	-0.0217	0.0087	0.000***		
Prob > F:	0.0039***	Durbin Watson:	2.0451		

**Table 2.** Five Models Results [Entire Sample Period]

\*Significant at 10%, \*\*Significant at 5%, & \*\*\*Significant at 1%

The results indicate a nuanced relationship between gold and stock markets in Bahrain, Qatar, and the UAE, where gold serves as both a hedge and a safe haven. However, it is important to note that these findings do not necessarily imply a direct correlation between the two roles. Theoretically, it is conceivable for gold to exhibit a negative correlation with stocks on average (indicating it serves as a hedge) while simultaneously being positively correlated with stocks under extreme market conditions (thus failing to act as a haven). Furthermore, it is plausible that gold does not depreciate during extreme stock market downturns (thereby serving as a haven) while maintaining a co-movement with stocks under standard market conditions (implying it does not act as a hedge). This multifaceted relationship underscores the complexity of gold's role as an investment asset across varying market conditions

#### Subsample Analysis

This section explores the validity of the results derived from the full sample period when applied to specific subsamples. To reinforce the findings obtained from the comprehensive analysis, it was essential to investigate the relationship between gold and stock markets during periods of crisis. The focus was on two significant crises that notably impacted the five selected MENA stock markets: the GFC and Covid-19 pandemic. These crises were identified based on descriptive statistics, which showed that stock market returns were significantly affected, with considerable fluctuations and volatility observed during these periods. Therefore, concentrating on the GFC and Covid-19 was appropriate, as they presented similar challenges across all five markets. To achieve this, the same methodological framework was employed; however, the analysis focused on distinct time frames corresponding to these crises: from 2008 to 2009 for the GFC, and from 2019 to 2020 for the Covid-19 pandemic. This targeted examination aims to determine whether the interactions between gold and stock markets observed during the full sample period are consistent during these turbulent times.

**Table 3.** presents the results derived from the five empirical models conducted during the GFC. The coefficient estimates for the average effect of stock returns on gold prices is -0.0235 for Bahrain, -0.0029 for Egypt, -0.0300 for Qatar, -0.1623 for Saudi Arabia, and -0.0782 for UAE. Notably, all estimates are statistically significant at the 10% significance level. These estimates suggest that gold functions as a hedge against stock performance in all five markets during the GFC. When examining extreme negative stock returns, the coefficient estimates at the 5% quantile are positive for Qatar and Saudi Arabia, indicating that gold did not fulfill its role as a safe haven asset in these markets. In contrast, Bahrain, Egypt and UAE exhibit negative coefficient estimate at the 5% quantile, suggesting that gold acted as a strong safe haven asset during extreme downturns, as evidenced by significantly negative values.

Dependent Variable:	Gold R	Sample:	$\frac{1}{1/2008 - \frac{12}{31}/2009}$		
- • <b>F</b> • • • • • • • • • • • • • • • • • • •	DCC	Included			
Method:	GARCH	<b>Observations:</b>	103		
	Bahrain (B	ahrain All Share Index)			
Variable	Coefficient	Standard Error	P-Value		
$b_1$	-0.0235	0.2210	0.009***		
b <sub>2</sub> (5%)	-0.0216	0.0090	0.016**		
b <sub>2</sub> (2.5%)	-0.0352	0.0049	0.000***		
b <sub>2</sub> (1%)	-0.0614	0.0125	0.000***		
Prob > F:	0.009***	<b>Durbin Watson:</b>	2.2247		
	E	gypt (EGX 30)			
Variable	Coefficient	Standard Error	P-Value		
$b_1$	-0.0029	0.1016	0.079*		
b <sub>2</sub> (5%)	-0.0304	0.0139	0.029**		
b <sub>2</sub> (2.5%)	-0.0392	0.0029	0.000***		
b <sub>2</sub> (1%)	-0.0295	0.0226	0.019**		
Prob > F:	0.003***	<b>Durbin Watson:</b>	2.1914		
Qatar (QE General Index - QSI)					
Variable	Coefficient	Standard Error	P-Value		
$b_1$	-0.0300	0.0284	0.029**		
b <sub>2</sub> (5%)	0.0068	0.0015	0.000***		
b <sub>2</sub> (2.5%)	0.0015	0.0007	0.000***		
b <sub>2</sub> (1%)	-0.0471	0.0018	0.000***		
Prob > F:	0.029**	<b>Durbin Watson:</b>	2.1051		
Saudi Arabia (MSCI Tadwul 30)					
Variable	Coefficient	Standard Error	P-Value		
$b_1$	-0.1623	0.0799	0.042**		
b <sub>2</sub> (5%)	0.0166	0.0124	0.018**		
b <sub>2</sub> (2.5%)	-0.0373	0.0058	0.000***		
b <sub>2</sub> (1%)	-0.0445	0.0175	0.000***		
Prob > F:	0.042**	<b>Durbin Watson:</b>	2.1951		
United Arab Emirates (DFM General Index)					
Variable	Coefficient	Standard Error	P-Value		
$b_1$	-0.0782	0.0689	0.025**		
b <sub>2</sub> (5%)	-0.0208	0.0088	0.018**		
b <sub>2</sub> (2.5%)	-0.0354	0.0047	0.012**		
b <sub>2</sub> (1%)	-0.0586	0.0121	0.000***		
Prob > F:	0.025**	<b>Durbin Watson:</b>	2.2098		

 Table 3. Five Models Results [2008 – 2009 Global Financial Crisis]

\*Significant at 10%, \*\*Significant at 5%, & \*\*\*Significant at 1%

Turning to the more severe quantiles of 2.5%, the coefficient estimates were significantly negative across all markets except for Qatar. On the contrary in the quantile of highest severity (1%), the coefficient estimates were significantly negative across all markets. These results imply that gold generally acts as a safe haven asset during periods of severe stock market distress in all markets.

The overall effect of any quantile is determined by summing all coefficient estimates associated with stock returns up to the specified quantile. For instance, the overall effect for the 1% quantile yields values of -0.142 for Bahrain, -0.102 for Egypt, -0.069 for Qatar, -0.152 for Saudi Arabia, and -0.193 for UAE. These results indicate that, during instance of extreme negative stock returns at 1% quantile, gold prices show a modest increase in Qatar, where gold prices rise significantly in all of the other markets. Consequently, the results indicate that gold serves as a weak safe haven asset in Qatar during GFC, however, with regards to Bahrain, Egypt, Saudi Arabia, and UAE, gold is classified as a strong safe haven asset due to an overall coefficient exceeding -0.1. Furthermore, the Fact that the sum of coefficient estimates is non positive for the 1% quantile yet positive for the 5% and 2% quantile in Qatar and Saudi Arabia suggests that gold serves as a safe haven only in the context of shocks exceeding the 1% quantile.

**Table 4.** presents the results derived from the five empirical models conducted during Covid-19 pandemic. The coefficient estimates for the average effect of stock returns on gold prices is 0.2986 for Bahrain, -0.3632 for Egypt, -0.0499 for Qatar, 0.0977 for Saudi Arabia, and 0.1616 for UAE. Notably, all estimates are statistically significant at the 10% significance level. These estimates suggest that gold functions as a hedge against stock performance only in Bahrain and Egypt during the Covid-19 Pandemic.

Table 4. Five Models Results [2019 – 2020 Covid-19 Pandemic]					
Dependent Variable:	Gold_R	Sample:	1/1/2019 - 12/31/2020		
Mathad	DCC	Included			
Wiethou.	GARCH	<b>Observations:</b>			
Bahrain (Bahrain All Share Index)					
Variable	Coefficient	Standard Error	P-Value		
<i>b</i> <sub>1</sub>	0.2986	0.1168	0.050*		
b <sub>2</sub> (5%)	0.0065	0.1180	0.095*		
b <sub>2</sub> (2.5%)	0.0222	0.0016	0.000***		
b <sub>2</sub> (1%)	-0.0295	0.0120	0.014**		
Prob > F:	0.050*	<b>Durbin Watson:</b>	2.2984		
	Egy	ypt (EGX 30)			
Variable	Coefficient	Standard Error	P-Value		
<i>b</i> <sub>1</sub>	-0.3632	0.0936	0.005***		
b <sub>2</sub> (5%)	0.0038	0.0067	0.057*		
b <sub>2</sub> (2.5%)	0.0070	0.0094	0.045**		
<i>b</i> <sub>2</sub> (1%)	-0.0204	0.0035	0.000***		
Prob > F:	0.004***	<b>Durbin Watson:</b>	2.3462		
Qatar (QE General Index - QSI)					
Variable         Coefficient         Standard Error         P-Value					
<i>b</i> <sub>1</sub>	-0.0499	0.4941	0.031**		
b <sub>2</sub> (5%)	-0.0601	0.0008	0.000***		
b <sub>2</sub> (2.5%)	-0.0085	0.0004	0.000***		
b <sub>2</sub> (1%)	-0.0766	0.0010	0.000***		
Prob > F:	0.003***	<b>Durbin Watson:</b>	1.9221		
Saudi Arabia (MSCI Tadwul 30)					
Variable	Coefficient	Standard Error	P-Value		
$b_1$	0.0977	0.0731	0.018**		
b <sub>2</sub> (5%)	0.0064	0.0123	0.095*		
b <sub>2</sub> (2.5%)	0.0225	0.0016	0.000***		
b <sub>2</sub> (1%)	-0.0293	0.0125	0.019**		
Prob > F:	0.081*	<b>Durbin Watson:</b>	2.3317		
United Arab Emirates (DFM General Index)					
Variable	Coefficient	Standard Error	P-Value		
$b_1$	0.1616	0.0720	0.025**		
b <sub>2</sub> (5%)	0.0416	0.0218	0.056*		
b <sub>2</sub> (2.5%)	-0.0217	0.0016	0.000***		
<i>b</i> <sub>2</sub> (1%)	-0.0295	0.1416	0.037**		
Prob > F:	0.013**	Durbin Watson:	2.3167		

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\*Significant at 10%, \*\*Significant at 5%, & \*\*\*Significant at 1%

When examining extreme negative stock returns, the coefficient estimates at the 5% quantile are positive in all markets except for Qatar, indicating that gold did not fulfill its role as a safe haven asset in these markets. In contrast, Qatar exhibits negative coefficient estimate at the 5% quantile, suggesting that gold acted as a strong safe haven asset during extreme downturns, as evidenced by significantly negative values.

Turning to the more severe quantiles of 2.5%, the coefficient estimates were significantly negative in Qatar and UAE. On the contrary in the quantile of highest severity (1%), the coefficient estimates were significantly negative across all markets. These results imply that gold generally acts as a safe haven asset during periods of severe stock market distress in all markets.

The overall effect of any quantile is determined by summing all coefficient estimates associated with stock returns up to the specified quantile. For instance, the overall effect for the 1% quantile yields values of 0.029 for Bahrain, -0.037 for Egypt, -0.192 for Qatar, 0.097 for Saudi Arabia, and 0.152 for UAE. These results indicate that during instance of extreme negative stock returns at 1% quantile, gold acted as a strong safe haven asset in Bahrain and a weak safe haven asset in Egypt. In contrast, gold did not posses the safe haven properties in Qatar, Saudi Arabia, and UAE.

This lack of safe haven characteristics in the latter markets may be attributed to the relatively moderate declines experienced by their stock markets during the Covid-19 pandemic. Although these markets faced a downturn, the magnitude of the decline was not as severe as those observed during the GFC. Furthermore, the mean returns in these markets remained positive, suggesting that investor sentiment was less panicked compared to GFC. Consequently, while the stock markets experienced declines, they were not significant enough to prompt a flight to gold as a protective asset.

These findings address the aim research questions of this study: while gold generally functions as a safe haven asset across various markets, its behavior can vary significantly between different crises. During the GFC, investors sought refuge in gold to safeguard their wealth against failing stock returns. In contrast, during Covid-19 crisis, the prevailing fear for personal safety led many investors to liquidate their investments to maintain liquidity for emergencies, rather than focusing on hedging their portfolios. As a result, gold failed to act as a reliable safe haven asset during this period.

## Conclusion

This study analyzed the safe haven characteristics of gold during crises in equity markets within MENA region. A key objective of this study was to investigate whether gold exhibits consistent safe haven properties across different countries within the MENA region and to explore how these characteristics may vary during different types of crises.

The study employed DCC-GARCH model to investigate the hedging and safe haven properties of gold in the largest MENA equity markets, utilizing the stock market returns data from the past 17 years (2006 10 2023). The initial analysis involved the use of gold international prices over the whole sample period. It was concluded that gold serves as a hedge against stock market volatility in Bahrain, Qatar and UAE. In contrast, gold was considered as a diversifier in Egypt and Saudi Arabia. A summary of these hedging properties and safe haven properties is presented in **Table 5**.

The second objective of the study focused on whether gold's properties differ across various crises. To investigate this, crises common to all sample markets had to be identified. Thus, the descriptive statistics were reviewed, particularly the time series graphs. The graphs revealed significant declines in all markets during the GFC and the Covid-19 pandemic. Consequently, the analysis was conducted during these crises as they were prevalent across the five markets.

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	Bahrain	Egypt	Qatar	Saudi Arabia	a UAE	
Hedging Properties of Gold						
Whole	Hedge	Diversifier	Hadaa (waak)	Diversifier	Hedge (weak)	
Sample	(weak)	Diversifier	neuge (weak)	Diversifier		
GFC	Hedge	Hedge	Hedge (weak)	Hedge (weak)	) Hedge (weak)	
	(weak)	(weak)				
Covid-19	Diversifier	Hedge	Hedge (weak) Diversifier		Diversifier	
	Diversifier	(Moderate)	fieuge (weak)	Diversifier	Diversifier	
Safe Haven Properties						
Whole	Weak Safe	Weak Safe	Weak Safe	Week Sefe Her	Strong Safe	
Sample	Have	Haven	Haven	weak sale hav	Haven	
CEC	Strong Safe	Strong Safe	Weak Safe	Strong Safe	Strong Safe	
GrU	Have	Haven	Haven	Haven	Haven	
Covid-19	Not a Safe	Weak Safe	Strong Safe	Not a safe	Not a Safe Haven	
	Haven	Haven	Haven	Haven		

 Table 5. Summary of Study Findings

The findings indicated that gold acted as a hedge in all markets during the GFC. However, during Covid-19 pandemic, it functioned as a hedge only in Egypt and Qatar, while it functioned as a diversifier in Bahrain, Saudi Arabia and UAE. Regarding safe haven properties, gold was identified as a strong safe haven asset during GFC in all market except for Qatar, where it was considered as a weak safe haven asset. In contrast, during the Covid-19 pandemic, gold acted as a safe haven asset only in in Egypt and Qatar.

These results indicate that gold's behavior indeed differs depending on the nature

of the crisis. During an economic crisis such as the GFC, gold effectively protected investors' wealth and acted as a safe haven asset. Covertly, during the pandemic, its classification varied, functioning as a safe haven asset in some countries while failing to do so in others. Future research should aim to investigate the underlying market conditions that influence gold's role as a safe haven asset, as well as the factors that may hinder its safe haven characteristics.

Moreover, A recent study by <u>Chen, Miao, & Tee (2023)</u> highlights the relationship between economic uncertainty and gold prices, finding that during period of economic uncertainty investors often turn to gold to preserve wealth and hedge their portfolios. This heightened demand tends to drive gold prices upward, reinforcing its role as a protective asset in uncertain times. Consequently, fluctuations in local gold prices can differ significantly from international gold price movements. Since local prices can more accurately reflect market conditions, this reliance on international prices represents a major gap in literature. Thus, future research should investigate the relationship between gold and stock markets using local gold prices.

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