NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF BANKING AND FINANCE

THE IMPACT OF GOLD PRICES, OIL PRICES,USD INDEX, AND COVID-19 ON THE S&P500

M.Sc. THESIS

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Approval

We certify that we have read the thesis submitted by Nyasha Nyamowa titled **"The impact of gold prices, oil prices, and USD index on the S&P 500**" and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Educational Sciences.

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Declaration

I hereby declare that all information, documents, analysis, and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of the Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Nyasha Nyamowa

25/01/2022

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Nyasha Nyamowa

Abstract

The Impact of Gold Prices, Oil Prices, USD Index and Covid-19 on the S&P 500

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MS Department of Banking and Finance January, 2022

This thesis empirically examines the long-run and short-run association between gold prices, oil prices, US dollar index, Covid 19 and stock prices by utilizing weekly time collection information data from investing.com. This data was gathered from 5 July 2009 to 31 October 2021. To test for unit root, ADF and PP tests were employed. More, so long-run and short-run analysis was examined using the autoregressive distributive lag (ARDL) model. In addition, the research utilized FMOLS, DOLS, and CRR equivalence to evaluate the long-term outcomes amongst the variables. The short-run results revealed a negative statistically significant relationship between the US dollar index and stock prices, and a positive statistically insignificant relationship between gold prices and stock prices. Furthermore, the long-run results using ARDL, FMOLS, DOLS, and CRR revealed the existence of a negative statistically significant long-term relationship between gold prices and the S&P500 stock market, a positive statistically significant relationship between oil prices and the S&P 500 stock market. Coronavirus dummy variable had a positive statistically significant impact on the S&P 500 in the long run. Advises for the authorities are specified to offer additional focal points on economic policies for gold costs, crude oil fees, US dollar index and stock prices to execute stability in America. This research is extensively advantageous to the government, policy and decision-makers, and investors since they can establish and apprehend the movements of the variables in the economy.

Keywords: gold prices, oil prices, US dollar index, stock prices. ARDL

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List of Abbreviations

ARDL: Autoregressive Distributed Lag

ADF: Augmented Dickey-Fuller

C19:   Covid 19

CPI: Consumer Price Index

CRR: Canonical Cointegrating Regression

DOLS: Dynamic Least Squares

DXY: U.S. Dollar Index

ETF: Exchange Traded Funds

FMOLS: Fully Modified Least Squares

GAP: Gold Accumulation Plans

GARCH: Generalized Autoregressive Conditionally Heteroscedastic

INR: Indian Rupee

LGP: Log of Gold Prices

LOP: Log of Oil Prices

LS&P: Log of S&P 500

LUSDI: Log of USD index

MERS: Middle East Respiratory Syndrome

NASDAQ: National Association of Securities Dealer Automated Quotations

NT: New Taiwan Dollar

NYSE: New York Stock Exchange

OECD: Organization for Economic Co-operation and Development

OLS: Ordinary Least Squares

PP: Phillip's Perron

SARS: Severe acute respiratory syndrome

US: United States

USA: United States of America

VAR: Vector Auto Regression

VECM: Vector Error Correction Model

CHAPTER 1

Introduction

Traders are usually enticed by these sections of the financial system, which offers them the most return with little volatility and a regular trend that suggests a price increase. Hence to maximize their wealth and profits, traders are seeking to discover these probabilities of rising price tendencies so that they can take advantage of them. The fundamental avenues of funding are divided into three markets which are equity, commodity, and debt respectively. In the first market, essential instruments are shares at the same time as in the debt market, there are bonds of unique sorts and maturities. In the commodity market, greatly treasured items are oil and gold. Investors additionally exchange foreign money in Globally Trade-in remote places alternate markets which are deemed being as the worldwide biggest economic market. These mentioned markets contribute significantly to the monetary system of any nation's improvement technique.

A global financial system consists of guidelines and policies agreements, financial institutions, and principles that are established globally that assist in the operation of distinctive investments, any countries imports and exports, and financial capital glide preparations in more than one country. Before the invention of money, silver and gold have been used as means of trade for services and items. Therefore, for economic activities, money was once considered less vital till the nineteenth century when there used to be a collaboration for exchange functions for world economies.

According to Abbas (2010) for the trade of items and services, unique international locations like India, America, Europe, and China have been following their way. Many nations were affected through the major economic crises, as a result, their economic system crashed and these countries had been affected badly, particularly in the stock price. For example, Turkey in 2001, Argentina in 1994, Latin America in 1994, East Asia in 1997, faced the international financial disaster from 2000 to 2001, and another global financial crisis in 2007.

And this research is prompted by the present-day variation of the gold costs, oil fees, and United States dollar index related to the downturn in stock prices. In association with the prevailing coronavirus pandemic.

Purpose of the study

This research targets to examine the developments that prevail in the United States economic system regarding gold, oil fees, the United States dollar index, Covid 19, and stock prices. Therefore, listed below are the particular goals of this research.

I. To examine the short-run effects of the gold fees, crude oil charges, United States dollar index prices, and Covid 19 on the S&P 500 stock market in the United States.

II. To analyze the long-term impacts of the gold fees, crude oil charges, the US dollar index, and Covid 19 dummy on the United States S&P 500 stock market.

III. To recommend essential problems that need to be taken into consideration by the government, policymakers, and planners.

*Hypothesis.*Based on the sub-problems used in this research, some hypotheses were developed.

HO There is no long-term association amongst gold fees, oil charges, United States dollar index, Covid 19, and S&P 500 stock market.

H1 There exists a long-term association amongst gold fees, crude oil charges, the United States dollar index, Covid 19, and S&P 500 stock market.

HO There is no short-term associationamongst gold fees, oil prices, US dollar index, Covid 19, and S&P 500 stock market.

H1 There is a short-run association between gold prices, oil prices, the United States dollar index, Covid 19, and S&P 500 stock market.

Significance of the study. This thesis will be extensive in generalizing the tendencies that exist amongst gold prices, crude oil prices, United States dollar index, Covid 19, and S&P 500 in the United States. More importantly, this lookup will

contribute significantly to policymakers, planners, investors, and the authorities simply to point out a few.

Firstly, this study will be beneficial for the Government in the United States because, whilst taking choice for the budget the federal Government anticipates expenditures of extraordinary commodities generally oil. The thesis will assist authorities 'decision-makers to reflect on consideration on price fluctuation for these commodities whilst decision making.

Additionally, these find out about will discover which variable amongst there three which includes gold, oil, and United States dollar index has the most important impact on theS&P 500 stock market in the United States. Such results will be useful to buyers whilst making funding in distinctive portfolios. Since traders in these markets constantly choose to reduce risks and enlarge earnings whilst funding in the stock markets. Suggestions of this research will assist them in thinking about the impact of international fees of crude oil and gold whilst investing in stock markets. This research will also assist traders to mix their funding portfolios by way of including gold, which may also have a vital function in hedging towards the continuous rising of prices and foreign money depreciation.

More so, these find out about will assist the managers and administrators of extraordinary groups to reflect on consideration on the effects of these elements on the stock market whilst selection making. It will additionally help to the funding corporations of banking and insurance plan businesses whilst investment selection making.

Furthermore, this research will additionally be essential to students and academics who may also use this lookup in discovering the foundation for research as literature evaluation for similar studies. And this research discovery will grant them a beginning factor in coming up with many different macroeconomic variables that may affect the stock market. They can also decorate this find out about to other countries as well.

Limitations of the Study. The scope of this research is constrained to the United States and weekly secondary records have been taken from 06 July 2009 to 31 October 2021. Data for this research was collected from investing.com for all of the variables.

Definition of Terms. This research has got four variables that are gold prices, oil prices, United States dollar index, Covid 19, and S&P 500 stock market.

Figure 1

Conceptual Model
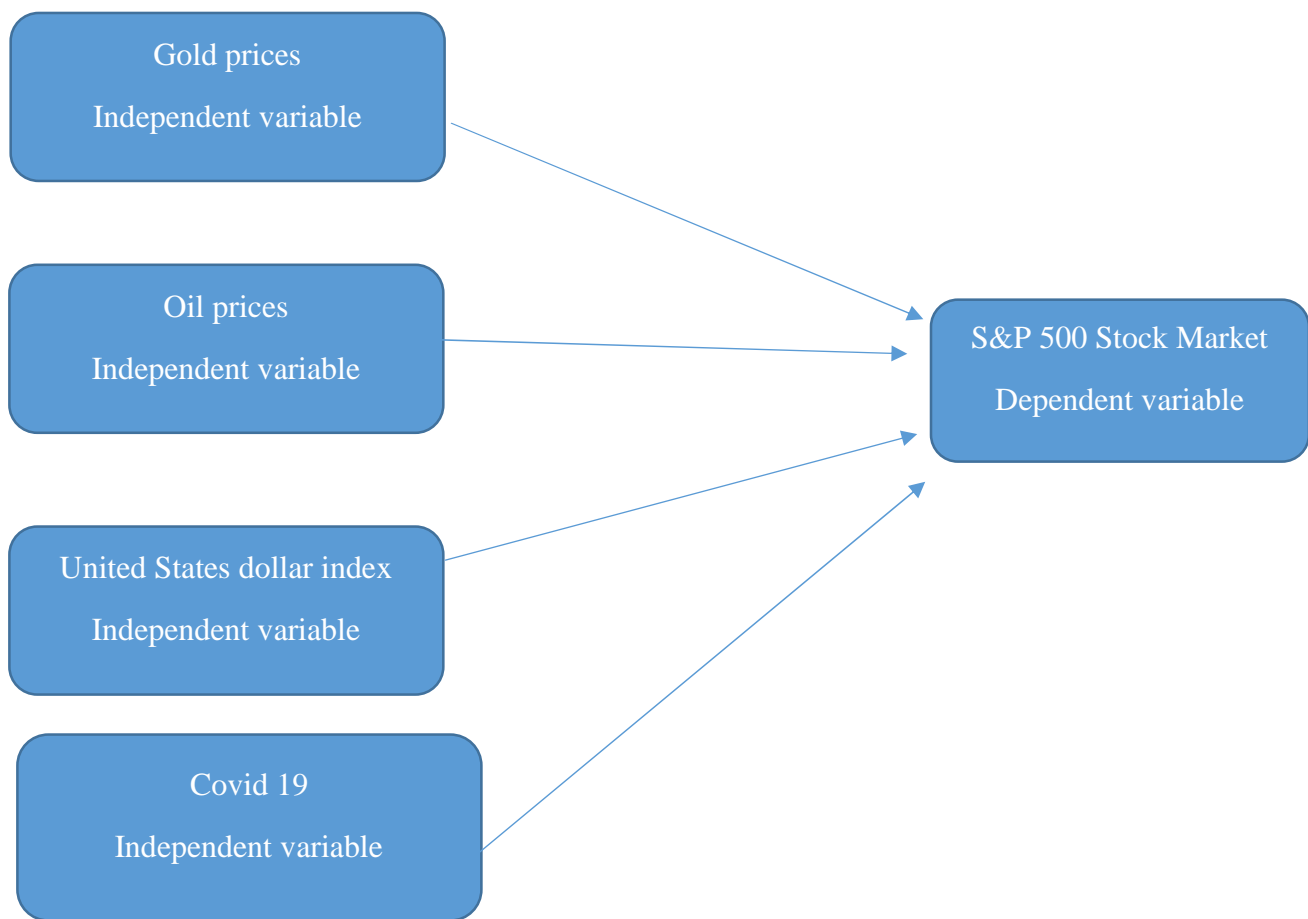
Gold Prices. Gold prices are the fee upon which gold is being exchanged on the gold marketplace and the United States is located amongst the top 10 gold producing international locations in the world and it is ranked at range 4 with an output of 190,2 tones. In numerous years, gold output in the United States fell under 200 tones and the persevering decline commenced in 2019. Across the world, gold has constantly been one

of the most essential and treasured commodities that add substantially to the monetary enhancement of the country and it is regarded as an icon of wealth, power, and prosperity. Also, gold is free from market risk. One of the first metals that had been excavated by human beings used to be gold and it has a hybrid nature as an asset. Throughout history, gold has maintained a special characteristic as a keep of value, means of exchange, an impenetrable source for investment, and many extra features which make it kinfolk to money.

Compared to shares and bonds as a funding choice for the long term and short term, gold is no much less popular. Physical gold such as gold bullions, gold jewelry, and gold coins can be invested in via the public. In latest years, extra systems have been developed to make investments in gold for instance Gold Accumulation Plans (GAP), gold funds, Exchange Traded Funds (ETF), and E-gold. Hence, because gold can be traded like a frequent stock, can be tracked and with the opening of extra structures to invest in gold thereby making it greater attractive as an investment portfolio. Among all different valuable metals, gold is more famous for investment. For a country to hedge in opposition to inflation, war, financial crises, currency devaluation, monetary and social uncertainty, it typically invests in form of gold certificates or coins.

In the previous decade, international locations that had gold have been regarded as the richest nations at that time. Gold is nevertheless used for exchange functions in a commercial enterprise in eastern countries. However, the price of gold is decided in the global market which is traded globally at an equal price. To get a tightly closed and secure return on funding in the international economic market, traders constantly reflect on the consideration of gold as a protected haven for their funding portfolio.

Movements amidst gold costs are both essential and fascinating from a financial and economic factor of view hence, people and nations are diversifying their property with gold. And the elements that affect gold prices consist of unemployment data, agricultural data, nonagricultural data, environmental data, global politics, worldwide activities, and predominant social-economic changes. Therefore, due to the downward spiral in the stock market return related to negative economic policies, traders feel reluctant to make investments in stocks and as a result, the demand for gold has been increased. Many

countries' currencies around the world are backed with gold and world markets monitor gold fees, and evaluate their position. Gold is universal, it has an identical value and it is extensively acceptable.

Gold is additionally considered free from any risks associated with the market. The returns of gold and T-bills are nearly comparable alternatively silver returns way less. When hedging inflation, silver and gold are both used. Gold is greater well-known for funding amongst all different metals that are treasured. Usually, funding in gold in the structure of cash and gold certificates is protection in opposition to a financial calamity such as battle, foreign money depreciation, the continuous rising of prices, and societal unpredictability. Hence to make funding safer many buyers have moved their funding in gold from money and the equity market to earn greater profits.

After the Civil War, the economic history of the USA talks about the significance of gold expenditures since 1987. The rapid increase of the output at some stage in these many years and acceptance of gold requirements over a wider area significantly augmented the demand for gold for economic purposes. for a long phase of the recorded past, gold was once a hedge because it was the foundation of the monetary system. it is a recognized truth that the financial system of the United States largely dictates the international economy and it is possible therefore prudent to use gold charge-related statistics from the US economy. Similarly, once the predictors of gold rate can be listed from the global literature, the data may also be acquired from the US economy for an apple to apple comparison.

Figure 2

Weekly Gold Prices Fluctuations

Gold Prices

Figure 2 above shows weekly gold prices from July 2009 to October 2021. Gold expenditures began to increase notably from 2009 after the great depression and in 2011 the gold fees reached their peak quickly after the Federal Reserve's QE2 program ended and the operation twist went into effect accompanied by utilizing QE3. And it has been continuously fluctuating between 1200 to 1770.

Oil Prices. Crude oil costs imply the spot charge regarding one barrel of the standard crude oil which is decided with the aid of the stability between its supply and demand. It is typically petroleum acknowledged as a fossil fuel that consists of hydrocarbons discovered in the structure of liquid in storage. Crude oil is an essential power item and financial analysts mentioned that oil price adjustments motivate instability in the economy. During the contemporary decade, the affiliation between expenditures of oil

price and the stock market costs has apprehended massive contemplation due to unique purposes. For example, rising costs of oil will affect manufacturing and electricity costs. The oil fees variations impact portfolio investments, often to investors who are seeking maximum portfolio funding.

According to the world meter results, the United States is ranked as the number one oil-producing country producing 14 837 639 510 barrels. In today's world, the economy mostly relies upon oil, and globally oil charge is the key aspect for the economic boom of any country in the power sector. Due to the expansion and industrialization of the transportation industry, the demand for oil increases in each developed and growing economy, the fee of oil will increase swiftly in the world inflicting ups and downs in the economies of a couple of countries. The exponentially developing demand for oil is presently developing issues for oil-producing nations to control the real demand of consumers.

Oil fees are directly linked with the service area and manufacturing sector of the economic system and an upward shove in the oil rate brings a hike in the fees of items and offerings, which ultimately brings a boom in the price level in the country. Hence, this may additionally have an effect on the performance of securities markets and industries at large. Additionally, oil costs affect many macroeconomic indicators such as gold price, GDP, US dollar index, stock price, and money elements of an economy. The influence of oil on growth is pretty striking. Nowadays, many organizations are compelled to change the mode of use components of their products take up new oil, and additionally, leave sectors that are no longer profitably ensuring that reduction of profitability companies. Because of the devaluation in actual currency, the authorities will enhance their protectionism in regards to exports and imports and this can also motivate a global recession.

In growing countries, some governments have set up surveillance structures for companies and consumers due to increasing prices. However, these surveillance systems only guard growth in the short run and it influences financial steadiness ensuing in authorities' debt in the long run. So, when it comes to oil market fluctuation, the government needs to focus on the two that is the short-run and long-run impacts.

In the last 4 decades, the dependency on power improved a whole lot quicker than ever before. The world witnessed a paradigm shift in the use of the supply of energy, from wind, water, and coal to oil and natural gasoline at some stage in this period. Fossil fuel performed an extensive function in the source of present-day energy generation as most of the usual energy-producing sources used to be replaced. However, upward thrust in the expenditures of oil and the environmental penalties of greenhouse gasoline emissions raised many eyebrows about the choice source of energy, a substitute to the use of crude oil. However, greater than a decade now, renewable sources of energy have improved their significance throughout the globe including in the United States of America (USA).

Structural prerequisites in every country's financial system in addition have an effect on the association between oil fees and financial growth. Developing international locations tend to rely mostly on the production sector which is extra energy-intensive compared to service industries. Even though transportation oil use is generally a smaller share of whole oil utilization in the non- Organization for Economic Co-operation and Development (OECD) nations, this use tends to enlarge unexpectedly as growing economies expand the need to cross items and people. Motor vehicle possession per person is additionally surprisingly connected with an increase in salaries and has lots of places to develop in non-Organization for Economic Co-operation and Development (OECD) countries. Due to these purposes, non-Organization for Economic Co-operation and Development (OECD) growth price tends to be a necessary element impacting the oil charge. China's robust financial boom has lately resulted in that nation turning into the biggest power client, 2nd biggest oil purchaser worldwide. To add on, China's increase in the consumption of oil has been an essential supporter of the incremental boom in international consumption of oil.

While present-day oil consumption is specifically associated with modern financial activity, modifications in the viewpoint of the upcoming years' financial stipulations may additionally have an instant influence on the prices of oil. For instance, an enhancement in the financial point of view would tend to amplify the hazard that oil fees will strengthen in the future, ensuing in greater anticipated later oil charges. This alternate in predictions would be mirrored in greater oil futures prices. This upward push

in future expenditures increases the incentive to maintain inventories, which in flip reduces accessible present-day supply and tends to elevate present-day current costs.

Oil fairs are showing present-day characteristics, there is now an increasing number more interconnected with different economic markets like the US dollar index, stock, and futures market. Oil is exchanged internationally globally in United States dollars and is intently linked to its worth. Depreciation of the American dollar inflicts the rising in the charges of oil, and the oil producers demand recompense for the devaluation value of money. ln the world financial crisis between 2008 and 2009, markets noticed an enlargement in the interconnection between crude oil and different commodities as demand diminished for unprocessed materials. Earlier than and after the world financial slowdown, there had been a noticeable rise in the interrelationship between commodity expenses.

Climate change may additionally have a massive position in the oil supply of oil. For instance, the Hurricanes that occurred in 2005 closed down oil, natural gasoline manufacturing, and refineries. Due to these impacts, petroleum product charges rose sharply as materials to the market decreased. A very cold climate may stress product markets as manufacturers strive to offer sufficient of the product, such as heating oil, to customers in a brief period, ensuing in greater fees. Some activities such as refinery outages or pipeline issues can avert the float of oil and its products, increasing costs. Hence, the impact of these sorts of elements on oil expenses tends to be noticeably short-lived. Immediately the trouble falls back then oil and product flow come back to normal, costs generally return to preceding ranges.

Figure 3

Weekly Oil Prices Fluctuations
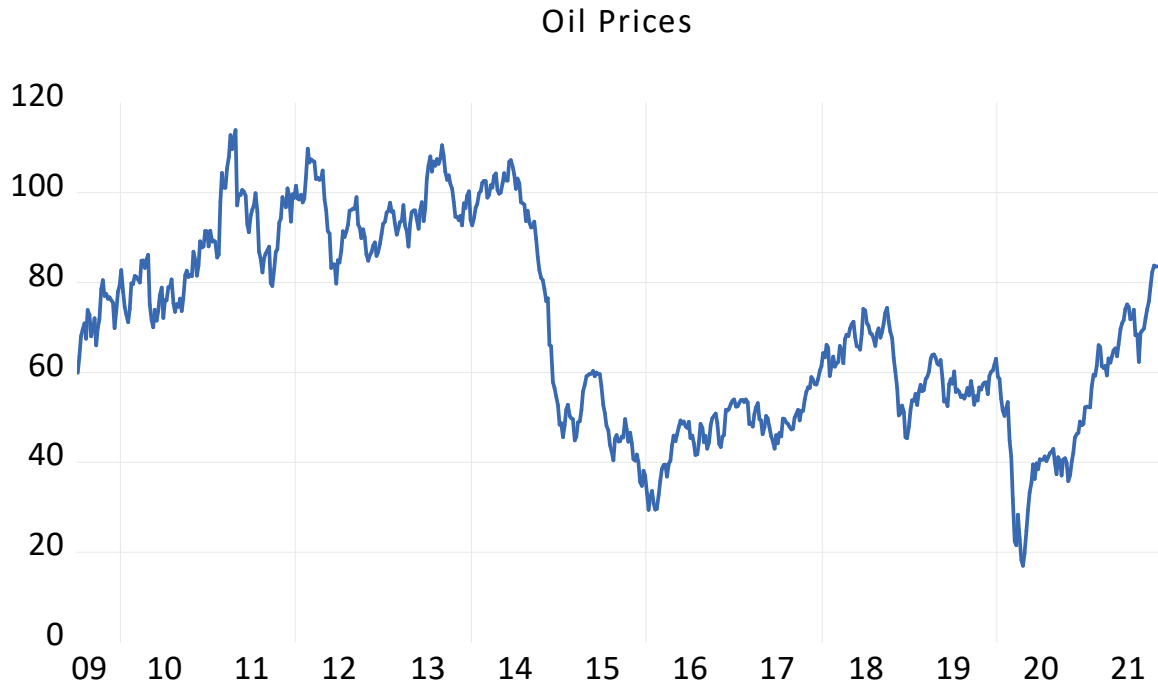
Oil Prices

Figure 3 above exhibits the fluctuations in oil prices from July 2009 to October 2021. However, the prices of oil notably dropped from mid-2014 to early 2015 due to the supply elements which include shifting OPEC policies, receding geopolitical issues, and booming United States oil production. oil expenses additionally sharply dropped between 2019 to 2020 as a result of the influence of the Covid 19 hammering the oil industry

United States Dollar index. The united states dollar index evaluates the United States dollars' worth related to a majority of its most distinguished buying and selling partner's currencies consisting of Euro, Japanese Yen, UK Pound, Canadian Dollar, Swedish Krona, and Swiss Franc. And their percentages are 57,6%, 13,6%, 11,9%, 9,1%, 4,2%, and 3,6% respectively. The United States dollar index commenced after the disassemble of the Bretton Woods system in March 1973. ln the beginning, the united states dollar index fee was one hundred thousand. From the time that it has been

exchanged, it compassed the very best level in February 1985, And its minimum point was realized on the 16th of March, 2008. Except for displaying the power of the United States dollar, it is additionally used as a trading exchange component.

Hence, The Dollar Index (DXY) is an indicator that indicates the value of the US dollar towards essential currencies. With the transition to the free US dollar index system after the cease of the Bretton Woods scheme, the Dollar Index, which was created to decide the typical state of the dollar and US dollar index, is a crucial index shaped by the geometric average of the overseas US dollar index of 6 developed nations.

The Dollar Index, which is cautiously monitored via financial market players, economic unit researchers, and different applicable stakeholders, guides people buying and selling in markets such as Forex and Stock Market, as well as a compass for researchers who attempt to make the experience of markets such as the interest and bond markets. Most efficiently, the amplifying of the Dollar Index suggests that all exchange costs related to the Dollar might also rise, while the decrease of the Dollar Index may also be a sign that the Federal Reserve may additionally make sizeable modifications in interest charge decisions.

In addition to rising or falling, the Dollar Index shifting within a constant or a certain band may also have some signs in terms of the economy. The Dollar Index with a sure trend indicates that some political or monetary processes in some or all of the world are in an unbalanced state, or at least some changes are taking place. On the different hand, a Dollar Index barring strong movements suggests that not only are economic strategies good but also political relations are exceedingly fine.

Factors that affect the US dollar encompass supply and demand. Demand for United States dollars increases since clients want to purchase goods and services in United States dollars. Hence, customers need to exchange their local currency for United States dollars to make the transaction. More so, when the United States authorities and massive American companies issue bonds to elevate capital that is then bought via overseas traders, those repayments will additionally have to be conducted using the United States dollars. This additionally relates to the buying of United States shares. company shares

from non-United States traders, essential to overseas traders to sell their forex to purchase dollars to buy these shares.

The mentioned examples above exhibit how the United States generates extra demand for dollars, and that in flip places strain on United States dollar supply, growing the worth of the dollar in comparison to the currencies being offered to purchase them, On the pinnacle this, the United States dollar is viewed as a secure haven in the course of instances of world financial uncertainty, so the dollar demand can regularly prevail regardless of fluctuations in the economic overall performance of the United States.

Secondly, technological characteristics affect the United States Dollar. Investors are assigned to gauge whether there is a larger dollar supply or much less dollar demand. To assist in deciding the task attention is needed to additional information and occasions that may have an impact on the dollar worth. The information consists of the launch of different authorities' data records, such as salary data, gross domestic data, and different financial statistics that may assist in the determination of the power or weak spot in the financial system.

Thirdly, Sentiment and Market Psychology also affect the United States Dollar worth. For instance, in a situation whereby the United States economy weakens and squandering reduces due to growing joblessness. The United States is faced with the opportunity to get rid of, which ought to be the reinstalling of the money from the issue of shares and bonds to reinstate the United States dollar currency. When overseas traders purchase the local dollar currency back results in a dampening impact on the United States dollar.

In addition, included are the views of large gamers in the market, including funding banks and asset administration companies, to decide the universal monetary sentiment. Sentiment will frequently drive the market as a substitute than the economic fundamentals of providing and demand. Mo so, combine of prognostication, investors are tasked with examining historical patterns generated by using seasonal elements namely aid and resistance stages and technical signals. A lot of investors trust that these patterns are cyclical and may be utilized in prediction of future price motions.

The United States dollar has to turn out to be the most vital trade tool in international exchange after the transfer of the British pound. With its soft (music, culture, cinema just to mention a few) and hard (such as military, economic embargo options) energy elements, the United States has managed to have a say in every country from the easternmost to the west of the world, the biggest indicator of this is the American dollar. This strength of America is so great that it makes a distinction with the use of its very own currency, even to countries such as China and Russia, which can rival America with their military potential.

Whether the Dollar Index is high or low, it has vital consequences for nations doing worldwide trade. The purpose of this scenario is that almost every country makes use of the US dollar. The truth that the US dollar is above the regular level makes it hard to promote United States merchandise in other countries, whilst the reality that it is under the regular level makes America's foreign trade figures less complicated towards different countries. Of course, America's desire is no longer to maintain the dollar too cheap, this will negatively affect the investments to be made in America, as it is known, the American Stock Exchange is the biggest in the world in phrases of volume, and foreign investments in the American Stock Exchange are of incredible significance for the American economy.

Figure 4

Weekly United Dollar Index Fluctuations

USD Index

Figure 4 above reveals the fluctuations of the US dollar index graph from July 2009 to October 2021 using weekly data. from late 2014 to early 2015 the US dollar Index continuously amplified due to the fact the Federal ended its expansive monetary policy thereby including the money supply as the economic system continued to enhance following the great depression. Secondly, the Federal additionally raised interest rates in December 2015which reinforced the value of the dollar further.

COVID 19. Covid 19 is the infectious sickness brought about by the most recently discovered coronavirus. This novel Covid was first and foremost found in Hubei Province in China in the city of Wuhan and it has rapidly spread all over the planet causing a pandemic. World Health Organization (WHO) declared that corona virus has a place with an enormous group of Covid known to incite respiratory

contamination covering from the normal cold to extreme infections like MERS and SARS.

The infection has quickly spread through the human-to-human transmission to numerous nations all over the planet. Nations that were especially impacted by this quick-spreading infection incorporate China, Iran, Italy and the United States of America contrasted with different nations on the planet. On 30 January 2020, this Covid 19 episode led the WHO to formally pronounce this pandemic as the worldwide general wellbeing crisis. Notwithstanding, on 11 March, this infection was changed to a pandemic. In the United States of America, the first case was affirmed on 20 January 2020.

Covid 19 has impacted 213 nations and regions all over the planet and has infected over 16 million individuals and has bring about in excess of 650 000 deaths. Consequently, because of this pandemic, numerous countries made their borders to stop guests to their country. More sol numerous nations took on a few estimates like overwhelming social separating, avoid unnecessary traveling and a restriction on get-togethers. Before the end of 20 March over 100 nations all over the planet had already embraced a few lockdown limitations affecting adversely their social and financial exercises.

Furthermore, the novel Covid has especially impacted monetary business sectors from one side of the planet to the other. It made a remarkable degree of hazard, making investors experience huge misfortunes in a couple of days. In March 2020, the United States securities exchange hit the circuit breaker system multiple times in ten days. The major financial exchanges indexes in America like the Dow Jones Industrial Average (DJIA) and Standard and Poor's 500 Index (S&P500) have declined altogether (Wagner, 2020). Numerous equity markets all over the planet encountered their quickest price reduction ever. Financial exchanges in Europe, Africa, and Asia have likewise plunged. Provided that the sensational developments noticed as of late in a few monetary business sectors all over the planet, numerous new examinations have utilized a few observational ways to deal with research the inevitable impact of corona virus flare-up on securities exchange returns and dangers in a few impacted nations like China, the USA, Japan, Korea, Singapore, Germany, Italy, and the UK.

First and foremost, the flare-up constrained the closure of associations and corporate exercises, then, at that point, impacted the monetary market. Second, vulnerability about the COVID-19 cases also affected traders' hypothesizing options, which then, at that point, created additional prominent unpredictability in the securities exchange. Therefore, a lot of companies experienced liquidity controversy no matter their size. Hence, three associations World Bank, Asian Development Bank, and International Monetary Fund-put away a sum of US $68.5 billion to assist the impacted nations.

The tourism industry-related was the principal impacted industry since in excess of 10 million guests from China and Singapore to Malaysia in the initial 3/4 of 2019. Further, more, lodging appointments were canceled, the greater part of which came from China. The corona virus epidemic outbreak similarly blows the aircraft business, and the quantity of tourist dropped radically. This additionally made the carrier business experience misfortune in income and affected related positions.

On the capital business sectors, especially the securities exchanges, the corona virus flare-up pandemic created the biggest turbulence from the time of the Global Financial Crisis. Whereas, securities exchange value developments mirror financial backers' assumption on the following income of recorded corporates, corporate profits are straightforwardly impacted by the constriction of utilization, creation concerned to the size, and industriousness of the pandemic. Besides, the financial standpoint and consequently the normal future profit will be antagonistically impacted by the stricter and longer limitations or lockdown forced by the public authority. Like the biggest economy, the United States, its securities exchange response to the widespread was initial a colossal drop of 34% in S&P 500 file (the everyday shutting) from close to 3,400 on nineteenth February to about 2,200 on 23rd March, whilst the NASDAQ experienced a major slide of 30 percent from about 9,800 to under 6,900 around a similar time. Notwithstanding, with the liquidity immersing from the United States Federal Reserve, the two business sectors have mobilized again from that point forward.

There are a few investigations of the COVID-19 effect on financial exchanges as of now, despite the brief timeframe since the flare-up. For example, Baker et al. (2020) see that the US financial exchange responded a great deal more powerfully to corona

viruscompared to past scourges (counting the 1997-98 Bird Flu, the 2003 SARS, the 2009 Swine Flu, and the 2015 Ebola pestilences) predominantly because of government limitations on business action and deliberate social distancing. The declaration of the human-human contagiousness of corona virus infection altogether affected the return on investment of sixteensignificant nations, such as China, Japan, and Korea. Financial exchanges experienced more regrettable returns than different business sectors, regardless of the way that the effect was short-term.

S&P 500 Stock Market. A platform where buyers and sellers trade shares and securities from listed organizations is referred to as a stock market and it is considered a key instrument of the economic system of any country. The stock market is viewed as a vital instrument and it performs an indispensable function in both industrial and economic success and improvement of the financial system of a country. Since the market is very sensitive, each country needs to reflect on consideration and examine elements affecting the stock overall performance and put on the exhibition. Hence for both investors and the government, variation in the market index is a serious issue and it is quintessential to spotlight troubles that create disturbances in the standard in which the stock market should perform.

Stock prices' evaluation of forecasting continually is a fascinating vicinity of analyst in finance and economy area. The stock market is extremely unstable because of a variety of economic indicators. These warning signs consist of but are not restricted to the consumer price index and rate of continuous rise in prices. Market volatility may be advantageous to investors, as it affords a chance to outcomes. Nonetheless, it additionally enlarges the threat of loss. Prediction can contribute an essential benchmark for market investigators, traders, or investors.

The S&P 500 is defined as the United States stock market index primarily focused on the market value of equity of five hundred giant corporations in the United States. And these companies must have stocks written down on the New York stock exchange (NYSE) or national association of securities dealers automated quotations (NASDAQ). The general momentary directions meant for the market are excellently indicated by the S&P 500 futures. S&P 500 future patterns help in indicating the strain on the market and

the stock market as well. For example, if the futures raise-up, the market strain upwards, and the stock market tend to rise. However, if futures go down, it is a signal of the presents of downward stress on the market and it will probably vogue lower. A fundamental motive that S&P 500 futures are so famous for detecting power is because this agreement trades twenty-four-hour daily on monetary exchanges around the globe. This approves investors and brokers to gauge the futures level earlier than the real stock markets commence for buying and selling which offers an experience of the market position probability trends before trading begins.

S&P 500 is the short form of standard and poor's 500, in America and it is a market guideused to trace five hundred public corporations in the United States. S&P 500 is viewed by a lot of investors regarded as the quality universal dimension of the United States stock market achievement. S&P 500 which funds a range of different market indexes, tracks the roots of funding statistical services that commenced in 1860 by Henry Varnum Poor. Far from the DowJones average, the S&P 500 computes weighted common stocks comprising the index. Thereby, the shares with a large market valuation impact the standard index more

Organizations that are enumerated on the S&P 500 symbolize the leaders of United States organizations, and adding and deleting from the listing regularly point out the market patterns. A number of the highest leading organizations in the guide encompass General Electric companies, Microsoft Corporation and Citigroup Inc. just to mention a few. Holding groups and real-estate stocks are no longer suitable to the statistics. Enterprise was once obtained in 1996 by McGraw-Hill Companies.

Individual corporations may also revolve in and out of the market. S&P Global's United States Index Committee re-evaluate and rebalance the list after every four months, even though it can happen each time in an attempt to make sure the index carries on in granting a consultant reflection of the large-cap United States equity market. For an enterprise to accomplish for the index, the following standards have to be achieved

I. Primarily based totally in the United States although it might have companies running in other   countries.

II. A minimum of $9.8 billion in the market value of equity.

III. Distinctly liquid and a minimum of 10% of the shares exquisite for the public.

IV. High revenue in the latest four months, and the four preceding quarters.

S&P 500 consist of popular names, a lot of them blue-chip organizations with robust overall performance pasts records of monetary performance. The ten biggest corporations by the market value of equity in the S&P 500 as of December 2020 encompasses:

1. Apple Inc. (AAPL)
2. Microsoft (MSFT)
3. Amazon Inc. (AMZN)
4. Alphabet Inc. Class A shares (GOOGL)
5. Alphabet Inc. Class C shares (GOOG)
6. Facebook Inc. (FB)
7. Tesla (TSLA)
8. Berkshire Hathaway (BRK.B)
9. Visa (V)
10. Johnson & Johnson (JNJ)

Figure 5

Weekly Gold PricesS&P 500 Stock Market Fluctuations

S and P 500

Figure 4 above displays the S&P 500 prices of the stock market fluctuations in the United States from July 2019 to October 2021. Between 2019 and 2020 the S&P 500 stock market droppeddue to the effects of the Coronavirus pandemic

Summary. Chapter one dealt with an outline of the research. It also supplied an extensive discussion, clarification of the significance of gold price, oil prices, US dollar index, and Covid-19 on the S&P 500 stock market in America. This area also discussed the research problem, hypothesis, questions, the goal of the research, and limitations of the research.

This research is arranged such that, Chapter two reviews the literature that relates to the United States dollar index, gold, oil, stock market prices, and other different microeconomic variables by researchers around the world. Chapter three deliberates on the data and methodology and chapter four covers empirical results and interpretation appropriate to obtain the research objectives. The last chapter concludes the research findings, future research directions, and references.

CHAPTER 11

Literature Review

Introduction

Chapter two explores the views of other authors, scholars, and exclusive research establishments who carried out numerous studies to look at the relationship amongst gold, crude oil, exchange rate, corona virus, stock market prices, and other macroeconomic variables in specific countries around the world. The outcomes of these studies are combined and reveal numerous relationships among these variables. Some research located negative or superb or no relationship between these variables hence the outcomes differs from one country to another. The type of literature used consists of textbooks, posted research papers, online sources, and journals. And this chapter mentioned the literature evaluation of distinct research and future directions.

Gold, Crude Oil, Exchange Charge, and Stock Market Fluctuation. Multiple research projectshave been executed to discover the relationship amongst gold, oil, the exchange charge, and stock costs. For instance, Singhal et al. (2019) analyzed the

relationship amongst gold and oil, exchange charge, and stock market prices in Mexico. The autoregressive distributed lag bounds tests strategy was implemented and the consequences cautioned that worldwide prices of gold in Mexico have a positive influence where as crude oil impacts them negatively. Oil expenditures negatively impact the exchange price and gold costs do not have any sizeable influence on the trade rate. Therefore, this research has vital implications that supply some indicators to financial, tax policy taking into account the stress generated by oil fees on stock market and exchange charges.

More so, Jain and Biswal (2016) investigated the association amongst international costs of gold, oil, United States dollar against the Indian rupee and the Indian stock market. They utilized the conditional correlation GARCH model and the asymmetric and asymmetric Non-Linear exams and determined that gold and oil costs motivate a devaluation of the INR and standard stock index. Hence, these finds out about also supported the disclosure of gold as a funding commodity category amongst traders and it additionally highlighted that policymakers in India need to incorporate change fee patterns and stock market volatility by implementing oil and gold costs units.

In addition, Ali et al. (2021) analyzed the impact of oil fees, gold costs, and exchange prices on the stock market performance. And outcomes published the absence of neither cointegration nor long term connection amongst gold, oil, exchange charge, and the stock market. But the VAR mannequin confirmed a full-size short-run association between these variables. The analysis advised that massive modifications in oil fees, gold, and exchange rate have a poor impact on the performance of the stock market.

Bakhsh and Khan (2019) also contributed to the future with the aid of exploring the interaction of the stock market index, gold prices, crude oil prices, and exchange charge in Pakistan. This study used the unit root, correlation, co-integration, granger, and VAR techniques. Outcomes revealedthe absence of long-term association amongst the evaluated variables. However, the results published the significant impact of oil prices and gold charges on the change rate. Furthermore, the extra center of attention on economic policies of the inventory index, oil and gold fee is given as government guidelines to make them stable in-country.

Furthermore, Alshammari et al. (2020) estimated the impacts of the gold fees, crude oil fee, and the exchange rate on the Kuwaiti stock using cross-wavelet coherency and partial cross-wavelet coherency. The findings published an effective association amongst the stock market and exchange both in the long term and, short term and an effective correlation amongst the Kuwait stock market and oil fees in a lower-frequencies band. More so, the effects showed a bad momentary association amongst the gold rate and the stock market. Therefore, the influence of oil charge is circuitously effective on the stock market ensuing in the motion of the exchange rate

Additionally, Sujit and Kumar (2011) examined the effective and complex association between gold fees, oil charges, exchange rates, and the stock market. This study used methods of time sequence data, cointegration, and VAR techniques. The outcomes confirmed that by modifications in different variables, the alternate charge is incredibly affected and in phrases of affecting the Exchange rate, the stock market has fewer roles. Furthermore, the find out about used two mannequins and in the long term, one of them recommended that there is a susceptible relationship amongst these variables

On the other hand, Ahmed and Kashif (2016) empirically explored the connection between gold charges, stock market index, exchange rate, and oil fees in Pakistan using time collection statistics starting from the start of the year 2005 till the ending of the year 2015. To analyze the variations, the VAR, ADF, and PP assessments had been implemented. And outcomes showed great variants in gold fees, oil charges, and exchange charge as a result of the stock returns while the exchange price has a substantial negative influence on stock returns and different macroeconomic factors did not signify any particular trend. Furthermore, this finds out about extending the door of future investment to investors that they need to no longer solely make investments in stock markets but rather invest in different commodities markets such as gold and forex.

The world order has grown to be dynamic in the globalized world, however, the parameters of success are nevertheless the same. Rastogi (2016) analyzed the external parameters such as exchange charge, crude oil fees, and gold charges, and stock market parameter has been taken as an interior parameter. This study has been deployed to discover the relationship between interior parameters and exterior parameters using

Johansen's cointegration, error correction, and neural network techniques. And the effects revealed a long-run connection between these parameters. However, the degree of affiliation among these variables is very weak.

Likewise, Khin et al. (2018) evaluated the causality association amongst the modifications of the Malaysia stock market prices, US stock price, Malaysian exchange rate, and crude oil fee on the gold charge in Malaysia. The learn about employed vector error correction with co-integration analysis, mannequin evaluation, and Granger causality. Based on the findings, in the short-run, crude oil charge and the lagged of the gold price had a large association. However, the Malaysia stock rate index, US inventory price, Malaysian contemporary exchange charge, and crude oil price had a big long-term association with the gold price. Additionally, the gold price granger causes Malaysia stock charge index, and crude oil fee granger causes gold price, both are un-directional causality.

Raraga and Muharam (2013) explored the effect of world oil fees and world gold costs on mutual relations amongst stock market guide and Exchange rate. To analyze the long-term relation, the find out about used the cointegration test, the VAR mannequin to analyze the impact and relationships amongst exchange fee and stock costs, and impulse response analysis was utilized to decide the response of exchange charge and the stock charge index on global oil and gold rate changes. The findings revealed that the world gold rate has no sizable effect on the exchange charge and the international oil fees have a sizeable impact on the exchange charge.

The effect of Covid-19 on the stock market. Several kinds of research have been executed to investigate the effect of corona virus on the stock market. Bahrini and Filfilan (2020) investigated the impact of the coronavirus on cases that were confirmed and deaths using daily data of the crucial stock markets in the Gulf Cooperation Council locations covering the time from 1 April to 26 June 2020. They used panel regression and the results revealed that the Gulf Cooperation Council countries negatively reacted to up to date and the sumcorona virus verified deceased individuals. However, the number of coronavirus cases that were confirmed was not significant. More so, other

evaluations suggested that the stock market impacted the crude oil costs positively and variation in the global oil market and stock markets had a negative impact.

Another study by Kusumahadi and Permana (2021) looked at the impacts of corona virus on stock return unpredictability in 15 nations around the globe. Utilizing everyday statistics from January 2019 to June 2020. They observed that adjustments of exchange rates have negatively impacted stock returns in several countries. Similarly, they distinguished primary changes over the perception period these underlying changes occurred following the first case of COVID-19 yet additionally prior in the period. Because of limit summed up autoregressive contingent heteroskedasticity relapses, they also found proof that the development of COVID-19 impacted stock return in totally all noticed nations besides the United Kingdom. Mo so, the presence of COVID-19 in a nation positively impacts the stock market.

Christos et al. (2021) examined how the stock market around the world reacted to the global financial that took place between 2007 and 2008 and the prevailing coronavirus pandemic. They used data from nineteen countries and energy derivatives from 1992 to 2020 using the vector autoregression. Their outcomes revealed that returns and volatility are high and that impact was robust. In addition, collected data from 1992-2020 ranged from 35.7 percent to 41.4 percent whereas volatility spillover ranged from 42.3 percent to 51.1 percent. Secondly, they discovered that the spillover impact is not constant as time goes on.

In their study, Elgammal et al. (2021) set to give first-hand proof on the dynamic relationship of return and volatility levels among global equity, gold, and energy markets before and in the course of the coronavirus pandemic. They used the GARCH model in their research. The results revealed that underneath the corona virus bidirectional returns spillover impacts amongst equity and global markets and out of the energy market to the equity market and gold it was unidirectional. The outcomes proposed the presents of large reciprocal stock spillover among equity and the two that consist of energy and gold markets and cross shock spillover coming from energy onto the gold market.

Sajjan Choudhuri (2020) studied the effects on the stock market in India. The research tried to assess the stock market decline from January 2020 to March 17, 2020. Statistics that was used was collected from secondary sources. This research aimed to assist individuals to understand the various phases of coronavirus that are accountable for the bearish mood of the market. Firstly, the flare-up entered the Chinese market. Thereafter it impacted almost every market around the globe. This study discovered three phases that are incubation, outbreak, and fever. In the incubation stage, the financial institutions commenced giving attention in the flare-up phase where the stocks began dropping.

Yiu and Tsang (2021) assessed the influence of corona virus on the stock market of emerging stock economies that include Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. The outcomes revealed that the global coronavirus pandemic has extra effect on the ASEAN5 stock market daily returns compared to the local coronavirus circumstances. Nevertheless, the coronavirus pandemic does not amplify the volatility of these markets in 2020. This study used weekly data and the outcomes showed that the prevailing widespread has a significant effect on the returns and volatilities on ASEAN stock markets. Furthermore, the results also suggested that the local monetary policy may assiston the reduction of the stock market volatility in the course of the outbreak, whilst the exchange rate policy might lessen negative effects on the stock markets in this area.

In addition, Topcu and Gulal (2020) aimed their research at investigating the effect of coronavirus on the emerging stock markets starting on the 10th of March 2020 to the 30th of April 2020. Results showed that the unfavorable effects of the pandemic on the emerging stock markets have slowly dropped and began to diminish by mid-April. According to classifications by region, the effect of Covid-19 is the topmost in Asian emerging markets whilst it is lower in the European emerging markets. They additionally found out that the reaction to time and measurements of the stimulus package by the authority's matter in offsetting the impacts of coronavirus.

Lee et al. (2020) aimed at investigating the impact of corona virus on the Malaysian stock market. They used Kuala Lumpur Composite Index and thirteen other sectoral indices as measured variables. They used four independent variables that included the

number of COVID-19 cases in Malaysia, China, andAmerica, the volatility index, and Brent oil fees. The data of this research covered the 31st December 2019 to the 18th of April 2020. The results indicated that the greaterthe total of coronavirus patients in Malaysia tend to negatively impact the accomplishment of the Kuala Lumpur Composite Index and all sectoral indices, excluding for the real Estate Investment Fund Index. More so, the outcomes revealed that Brent oil prices and the volatility index tend to impact the Malaysian stock market performance. Hence the outcomes of this research will assist traders to apprehend the impact of coronavirus on the various sections in Malaysia.

To add on, Varma et al (2021) assessed the short-term effect of coronavirus on the Indian stock market major index and its various basic sectors. This study employed 3 separate models that include the constant return model, market model, and market-adjusted model. The results revealed were heterogeneous and depended mostly of districts. However, every sectionwas affected for a moment but the financial sector was terrible. Sectors that include pharma, consumption items and information and technologyhave a positive or limited effect. Hence these outcomes may be very important for traders in protecting equity securities from unpredictedprostration and building superior funding conclusions to keep away from huge unpredicteddeficit.

In their research, Sahin and Uyah (2021) analyzed and interpreted selected countries' stock markets during the pandemic utilizinggraphsgenerated with data of coronavirus and stock market indices. The results revealed that the enlarge in the total of coronavirus cases and deaths caused a massive drop in the stock markets. This research also noticed that indices in the course of coronavirus showed an alike trend with the epidemic in several nations.

Gold Prices, Oil Price, and Exchange Rate Association. On the opposite hand, the affiliation among gold fees, oil fees, and the exchange charge got here to an interesting conclusion. For instance, Seshaiah and Behere (2009) tested whether or not the exchange charge and crude oil fees have an impact on India stock market costs or not. To determine the long term association amongst these variables, this research employed Engel-Granger and cointegration tests, VECM, variance decomposition tests. Obtained outcomes represented that in the long run, stock rate indexes are cointegrated

with exchange prices and crude oil fees. More so, the effects indicated that the stock market prices are stimulated with the aid of oil and the exchange rate at lag-25.

Chang et al. (2013) also empirically explored the correlation of oil fees, gold costs, and the NT dollar versus the U.S dollar exchange rate. Johansen cointegration test, vector autoregression model, Granger causality test, impulse response analysis, and variance decomposition were used to make clear the connection amongst these 3 variables. The outcomes posted that oil prices, gold prices, and exchange charge significantly remained impartial from each other, this means that the government has to reflect on the separation of monetary energy policies.

In their study, Houcine et al. (2020) analyzed and measures the nature of the affiliation between crude oil price, EUR/USD exchange rate, and gold prices utilizing the ARDL. The acquired outcomes showed the absence of cointegrating connection betweenthese variables in the short term. In addition, this study variable was positive, the granger causality tests showed a one-way causal relationship amongst these variables and a unidirectional causal relationship among the gold fee and crude oil fees.

Gold Prices, Crude Oil prices, and Stock Market Nexus. Numerous researchwas performed the further explain the connection amongst gold costs, oil fees, and stock prices. To illustrate this, Tursoy and Faisal (2018) empirically examined the long-term and short-term relationship among stock costs, gold fees, and crude oil charges using monthly records from Turkey. They used the ARDL, fully modified least squares, dynamic least squares, and canonical cointegrating regression equations. Outcomes revealed that both short-run and long-run outcomes validated a poor association between gold and stock prices and an effective relationship between crude oil and stock costs. Additionally, using the channel of gold and crude oil prices converges to long-run equilibrium role by using 0.39 speed of adjustments and the Granger causality check indicated a short run, long run, and joint unidirectional causation from gold prices to stock prices.

Due to the Covid-19 crises that have to unfold throughout the world, Hung and Vo (2021) researched to investigate the impact and time-frequency

interconnectednessamongst S&P 500, crude oil fees, and gold prices implying the spillover index of Diebold and Yilmaz and the wavelet coherence. The results shed mild on the differentiation with the pre-corona virus duration and throughout the coronavirus disaster where the go-back transmission is extra apparent. Furthermore, amongst the oil, S&P 500, and gold prices there exist significant pattens about data spillover that would possibly provide vast implications for government agencies, investors, and portfolio managers.

Hussin et al. (2013) targeted the connection amongst oil and gold fees and the Islamic stock market in Malaysia by implementing the VAR model. The research implied the co-integration analysis, Granger causality test, impulse Response Function, and Variance Decomposition analysis. The results published that in the long run, Islamic market returns had been not co-integrated with strategic commodities and the existence of a bi-directional causality association amongst the Islamic stock returns and oil costs. The FBME was not affected by the gold charges. Therefore, in the short run, solely oil price impacts the Islamic inventory return proving the truth that gold price is not legitimate for predicting changes in the Islamic share prices.

Another study by Baig et al. (2013) resort to analyzing the affiliation amongst gold fees, oil costs, and KSE100 returns. To examine the connection amongst gold, oil, and the stock market, this learns about utilized Descriptive statistics, the ADF and PP checks, Johansen and Jelseluis Co-integration test, Variance Decomposition techniques. And in the long run, the outcomes published that there is no considerable relationship amongst these variables. Additionally, this research gives legitimate knowledge to traders who choose to enjoy the advantages of diversifying in funding in gold, oil, and the stock market.

Kousar and Shbabir (2019) discovered the effect of gold and oil fees on the stock market in Pakistan. The find out about utilized descriptive stats, ADF assessment, Correlation, and ARDL examinations and the effects confirmed a good-sized effect of oil and gold on the stock market. Therefore, following the empirical evidence, the writers suggested that traders need to make investments in gold because the increase in the continuous rising of prices decreases the actual cost of property and earns additional returns.

Additionally, Singh (2014) researched to discover the causal association between gold fees, oil costs, and stock market index by implementing the Johansen cointegration and Granger causality test. This research additionally used the ADF and PP for unit root assessments and the cointegration exams validated the presents of along-term equilibrium connection amongst these variables. Furthermore, the existence of unidirectional causality was recommended with the aid of the granger causality check and the effects also revealed an effective relationship between these variables.

Another strand of lookup by Ananazeh and Al-Zararee (2016) put forward extensive volatilities of oil and gold fees have a massive impact on the monetary movements of any country in the globe. Hence, this paper examined the dynamic association amongst the return of the Amman stock exchange and the costs of gold and oil that are viewed as the most vital commodities in the world. The article concluded that long-run causality strolling between these variables and a co-integration between variations in gold and oil fees on the stock costs of ASE which possess suggestions that are exceptional in the region for all investors.

Other Macroeconomic Factors and Stock Market Nexus. Empirical work from other research centered on different macroeconomic factors and stock costs. For example, Sheikh (2020) indicated whether or not the association amongst macroeconomic fluctuations and stock costs is symmetrical or asymmetrical. The find out about used four kinds of unit root checks that encompass ADF, PP, Kwiatkowski Philips Schmidt Shin, and Zivot-Andrew exams and the findings recommended that, in the lengthy run, and earlier than the global financial crises, traders respond in a dissimilar action to gold and oil fees. However, following the global financial disaster, traders in another way responded to negative-positive changes in gold costs, exchange charge, and interest rate. Therefore, at some stage in funding decisions, investors, government, and other stakeholders consider the asymmetric influence of macroeconomic factors in the stock market.

Moghadam and Moghadam (2016) have published the influence of oil charges, exchange rate, and continuous rising of prices (inflation) on the stock costs of the Tehran stock exchange. The article employed the ADF check and the variance autoregressive

model with an error correction model and the outcomes confirmed a great positive impact of adjustments in crude oil fees on the stock costs changes. More so, it revealed a tremendously positive influence on the changes in inflation rate and market exchange charge on the stock rate changes, and the greatest share in the stock costs was established totally on the evaluation of variance modifications in the exchange rate. And this paper supplied advisable implications for traders and Policymakers.

Empirical work from the early stage with the aid of Bahmani-Oskooee and Sohrabian. (1992) have been amongst those who introduced the cointegration and Granger causality to describe the path of interchangeable association among 2 variables. This study used month-to-month records on S&P 500 and United States dollar implicit exchange rate from 1973 to 1988 and the outcomes published bidirectional causality in the short-run. However, a lot of articles have investigated similar factors in a range of international locations using these econometric techniques and have indicated combined and diverse findings.

In addition, Gokmenoglu and Fazlollahi (2015) examined the massive effect on the stock market rate of the gold fees, oil costs, the volatility of gold, and oil prices and they used the ARDL co-integration strategy to elevate this task. The effects indicated the presence of long-run equilibrium amongst these variables and additionally, it revealed that in the lengthy run, the S&P500 stock market price converges by 1,2% pace of the everyday adjustments contributed with the aid of the gold and market and their volatilities.

Stavarek (2005) stated the essence of the indifferent affiliation between stock costs and positive exchange rate in senior European Union member's international locations that consists the UK, France, Austria, and Germany and recently added European Union member's nations that encompass Slovakia, the Unites States of America, Hungary, Czech Republic, and Poland. This paper used the vector error correction model, cointegration analysis, and Granger causality checks and the result confirmed that there is an awful lot greater causality in countries with foreign market exchange and developed capital that is the USA and old EU-member countries than in new-comers. Furthermore, between 1993 and 2003, the evidence suggested more effective long-runand also short-term causal relations than at some point in 1970-1992.

Furthermore, Lin et al. (2019) carried out the risk contagion amongst the Brent crude oil market, London gold market, and the stock markets of Chinese and European. This article employed the complete ensemble empirical mode decomposition with adaptive noise (CEEMDAN) approach and Granger causality check and the outcomes published that single direction risk contagion strolling from the Brent crude oil markets and the London gold market to the Chinese and European stock market have been found un irregular events. Firstly, bidirectional risk contagion amongst the Brent crude oil markets, London gold markets, and Chinese and European markets was observed on severe occasions while bidirectional risk contagion between the Brent crude oil markets, London gold market, and European stock market is being verified in irregular events. Nonlinear Granger causality arising out of the crude oil markets to the Chinese and European stock markets had been constituting within the bull and bearish markets and Chinese stock market to the gold market and originating from the gold market to the European stock market have been determined in intense bearish markets.

In their study, Delgado et al. (2018) examined and explained how oil fees, exchange charge, and stock market costs engage with each other in the Mexican economy. The learn about used Vector Autoregressive Model and indicated that the exchange price possesses a poor major substantial influence on the stock market. More so, they also discovered out that the consumer price index has a tremendous effect on the exchange price as well as a negative impact on the stock market. The findings additionally suggested that oil fees are considerably substantial in opposition to the exchange rate. However, with time, the impulse-response features confirmed the fact that influences discovered tend to vanish

More recently, Ahmed et al. (2021) given the strong dependence on oil in China investigated the impact of oil fees on the exchange charge and the stock market in China using each day records from 4 January 2010 to 29 March 2021. In this analysis, Nonlinear ARDL was utilized to locate the influence of oil fees on the exchange charge and the stock market in the short term. In the short term, oil fees were discovered to extend the Renminbi vis-à-vis the United States dollar and to appreciate stock prices

significantly. Additionally, accounting for structural breaks was once found critical for cointegration in the usage of oil fees to explain exchange charge and stock costs.

Another find out about by Khan et al. (2019) scrutinized the effect of oil charges on stock costs in the Shanghai stock change using the ARDL model. The empirical outcomes indicated that their cointegration amongst oil fees and stock costs and the mannequin also validated that in the two that is the short-run and long-run oil fees possess a poor enormous effect on the stock costs of the Shanghai stock exchange. A reduction in oil fees demonstrated an effective impact on the stock returns and the research recommends that oil prices dynamically contribute to the stock costs thusly that affects the income of traders in the stock market.

Zhao (2010) put forward arguments to analyze the dynamic affiliation between Renminbi (RMB) actual high-quality exchange charge and stock costs using vector autoregressive model and multivariate generalized autoregressive conditional heteroscedasticity. The findings published nonexistence of a steady association amongst exchange charge and stock costs in the long term and additionally between the currency exchange price and the stock price, there are no mean spillovers. Additionally, the cross-volatility impact amongst exchange and the stock costs confirmed that there is a bidirectional volatility spillover linking these 2 markets. This indicated the presents of an excellent influence on future volatility in the exchange market in the past improvements in the stock market.

Ali et al. (2020) made a find out about to look at an experimental association amongst the stock market volatility, gold prices, exchange rate of a developing economy in Pakistan. The learn about utilized MGARCH to explain stock returns and investigated the volatility in the exchange rate and the gold fees remained sturdy in bullish and bearish stipulations using a quantile regression approach. Overall results confirmed a terrible impact of exchange charge and gold costs volatility on the stock market achievement aiding the truth that the stock market contemplates gold price and exchange rate variations.

In 2018, Areli et al. (2018) researched to explain how oil fees, exchange rate, and stock costs have an interaction with one other in the economy of Mexico. Investigated time of periodic records and Vector Autoregressive Model (VAR) was carried out that included oil fees, nominal exchange charge, stock costs in Mexico, and consumer price index (CPl). Results indicated a statistically negative huge impact of the exchange price on stock costs., indicating the existence of an upward shove in the exchange charge is related with the ascend in the stock market. More so, it also determined that the consumer price index possesses a tremendous effect on the exchange fee and a negative effect on the stock costs. This article outcome additionally showed that oil fees are statistically significant in opposition to the exchange price hence, a rise in oil fees generates an increase in the exchange rate.

Last year, Chkir et al. (2020) investigated the multivariate dependence amongst oil fees, equity markets, and exchange rates in chosen oil-exporting international locations and oil-importing nations using the vine copulas method which has the benefit of providing tremendous flexibility and approves complicated modeling of dependency patterns. The outcomes confirmed a significant poor dependency amongst oil and exchange rates in the course of exceptional intervals of investigation, besides the Japanese Yen and British Pound. In addition, the results indicated that oil might also serve as a weak hedge in opposition to Exchange rates.

Another study by Basher et al (2012) proposed as well as estimated a structural VAR mannequin to analyze the variation affiliation amongst oil costs, exchange charges, and emerging stock market costs calculated using the general and the lately developed projection. The model supported stylized statistics and in the short run, positive changes to oil fees tended to reduce market stock costs and exchange rates. More so, the mannequin additionally captured the fact that a positive variation to the actual monetary actions will increase oil costs whereas an effective oil production shock lowers oil prices.

Summary of Literature Review. Chapter 2 defined supporting uneven and irregular relationships and the existence of asymmetries in the stock, gold, oil, and exchange rates straight through preceding writings. This section additionally mentioned

the writings of modern-day and applicable research recorded in economically developing and more developed countries. Speculations of this thesis are additionally advanced in this section. Several hypotheses are furthermore discussed in this segment. Eventually, a review of literature is fashioned to briefly elaborate on the compatible previous literature findings.

CHAPTER 111

Methodology

Introduction

Chapter three focuses on the thesis approach, description of this research data, statistical accumulation techniques engaged procedures, econometric representations, analytical strategies information evaluation methods, and the dimension of variables. This chapter is very essential in quantitative research due to the fact it grants a guiding principle for data analysis.

Data. This thesis ambitions at investigating the effects of gold fees, oil costs, Covid 19, and the United States dollar index on the S&P 500 stock market in the United States of America. Weekly time collection information was accumulated from investing.com for the gold costs, crude oil feels, United States dollar index futures, and S&P 500 stock market. And a dummy variable for Covid 19 was used. This data was gathered from 5 July 2009 after the global financial crisis that ended in June 2009 to 31 October 2021. Global financial crises triggered global monetary shocks that resulted in numerous financial institution failures. During this period, economies international slowed down because savings tightened and international exchange declined. Furthermore, unemployment increased, housing markets suffered inflicting evictions and foreclosures. And various corporations failed. Hence this thesis makes use of records after the world financial crises to evaluate the modern state of affairs effects of gold prices, oil fees, and US dollar index on the S&P 500 stock market.

Gold prices are the fee upon which gold is being exchanged on the gold marketplace, crude oil costs imply the spot charge regarding one barrel of the standard crude oil which is decided with the aid of the stability between its supply and demand. The United States dollar index futures compute the cost of the United States dollar in relation to specific other six currencies. These are frequently mentioned as a basket of United States exchange associates currencies, this consists of euro, Japanese yen, pound sterling, Canadian dollar, Swedish krona, and Swiss franc. Covid 19 is a contagious disease caused by the most recently discovered coronavirus. S&P 500 stock market refers to a stock market index following the overall achievement of five hundred huge corporations recorded on stock change in America. S&P 500 stock market were used as the dependent variable while gold prices, oil prices, and the United States dollar index were used as the independent variables.

Data Description. To acquire the goal of this research distinctive statistical applications have been engaged to examine the collected data. Microsoft excel was utilized for statistical administration and Eviews eleven for exclusive analytical methods

And the linear association amongst the explanatory factors and dependent variable can be formulated in function:

S&P500SM = f (gold prices, oil prices, US dollar index and, Covid 19)   (1)

Methodology. This thesis encompassed many methods that include unit root tests, ARDL, diagnostic tests, FMOLS, DOLS, and CRR tests.

Unit root tests. The first and most necessary exam adopted is the unit root exam by using the Dickey-Fuller checks. It was a system that was originated in 1979, regarded as the easier Dickey-Fuller (D.F.) exams. Furthermore, it is primarily established on the approximation of a 1st order Autoregressive Model AR (1), which is expressed below:

$$X_t \qquad = \qquad x_{t-1} \qquad + \qquad _t$$
(2)

The stochastic error which is denoted by $_t$ which is expected to possess the preceeding circumstances:

$$E(_t) = 0, \quad Var \ (_t) = E \ (X_t - \mu) = ^2, \quad Cov \ (_i, _j) = 0$$
(3)

It is then referred to as the White Noise Error Term. If (= 1), denotes the factor (Xt) possesses a unit root and experience from the trouble of not being stationary. After subtracting (xt-1) from each aspect of the preceding equation, it can then be standardized as bellow:

$$x_t = (- 1) \ x_{t-1} + \ _t \quad (4)$$

Following circumstances: (-1 = p). the equation develops into:

$$x_t = (- 1) \ x_{t-1} + \ _t \quad (5)$$

Implementing the ordinary least square (OLS) model, three models are estimated and they are formulated as bellow:

$$X_t \qquad = \qquad Px_{t-1} \qquad + \qquad _t.... \qquad M$$
(6)

$$X_t = {}_0 + Px_{t-1} + {}_t \ldots.M$$
(7)

$$X_t = {}_0 + {}_1 t + Px_{t-1} + {}_t \ldots.M$$
(8)

The above is ready to test for the preceding nullified assumption

H_0: $p = 0$ (1) Nullified assumption

$H_{1:}$ p 0 (2) another assumption

On condition that $P = $ zero is discovered to be $Xt = {}_t$, the collection is not stationary at level. If the other speculation is encountered, the sequence is stationary and is stated in the command of I (0). The sequence may additionally come to be non-stationary following the 1st difference or the 2nd difference, then it is pronounced that the sequence in query is stationary (integrated of command 1), I (2).

Empirical Model. This thesis employed the ARDL bounds test that is the extension of the ARDL mannequin by Pasaran and Shin (1995) to empirically inspect the short-term and long-term nexus amongst gold costs, crude oil fees, and the United States dollar index on the S&P 500 stock market in the United States. This mannequin approach does not encompass the pretesting of factors that suggest that the exams for the presents of the affiliation amongst gold, oil, US dollar index, and S&P 500 in tiers are relevantly disregarding whether or not the fundamental repressors are either l (0) or l (1) or a combination of each of the two. Hence, we employed the Peron (PP) check by Phillips and Perron and the Augmented Dickey-Fuller ADF test by Dickey-Fuller to make sure that gold prices, crude oil costs, and the United States dollar index on the S&P 500 stock market are stationary at either l (0) or l (1).

Therefore, the econometric mannequin can be precise as follows:

$$InS\&P\ 500\ SM_t = B_0 + B_1 lnGP + B_2 INOP + B_3\ lnUSDI + B_4\ lnC19\quad u_t$$
(9)

Where S&P 500 SM represents the S&P 500 stock market in America, GP shows the gold price, OP characterizes the oil price and USDI represents the United States dollar index, and C19 represents Covid 19. B0 is the intercept. B1, B2, B3, and B4 are the slope coefficients and t is the white noise error term and t signifies the period duration (t= 1,2……., t) All the factors are transformed into natural logarithm that is indicated utilizing the above-mentioned equation.

ARDL. The ARDL mannequin is utilized to measure the short-term association amongst gold prices, oil prices, US dollar index, Covid 19 and S&P 500 stock market. It has an essential benefit in that it is more sturdy and bendy when it is in contrast to different alternative techniques like Engle and Granger (1987), Johansen (1988), and Johansen and Jeselius (1990) procedures. More so, it has extra strength and is also advocated to practice on a small-scale illustration dimension learn about (Pesaran et al., 2001; Ghatak and Siddiki 2001; and Acaravci and Ozturk 2012).

The most vital adaptability of the autoregressive distributed lag bounds check strategy is it can be used even when all the variables are not identical in the order of integration. In agreement with this model, the presents of a cointegration association can be explored amongst the collected data regardless of whether or not the underlying factors are stationary at level or first difference or collectively built-in and this factor is the biggest benefit of the bounds check than different conventional co-integration examination.

Following discussion of the ARDL benefits, the bellow equation is developed to discover the presents of long-term association amongst gold, oil, US dollar index, and the S&P 500 stock market:

$$\ln SM_t = {}_0 + \sum_{i=1}^{n} {}_1 \ln SM_{t-i} + \sum_{i=1}^{n} {}_2 \ln GP_{t-i} + \sum_{i=1}^{n} {}_3 \ln OP_{t-i} + \sum_{i=1}^{n} {}_4 \ln USDI_{t-i} + {}_1 \ln SM_{t-1} + {}_2 \ln GP_{t-1} + {}_3 \ln OP_{t-1} + {}_4 \ln USDI_{t-1} + {}_{t1}$$
(11)

 0 denotes the constant, 1, 2, 3, and 4 are the short-term dynamic coefficients, at the same time as 1, 2, 3, and 4 are the long-term coefficients,   represents the 1st distinction and t1 is the white-nose error term.

The initial step in the autoregressive distributed lag bounds checking out method is to evaluate the above function by way of normal least squares to take a look at the presents of a long-term association amongst the factors by administrating the F-exam for the joint significance of the coefficients of the lagged level factors. The presents of the long-run association amongst the factors are proven with the aid of a certain F-statistic. Abounds F- check is virtually a take a look at of the speculation of no cointegration amongst the variables (H0: 1=0, 2=0, 3=0 and 4=0) in opposition to the presence of cointegration amongst the variables (H1: 1 0 or 2 0 or 3 0 or 4 0). 2 units of integral value bounds for the F- statistic was put forward by Pesaran et al., (2001) for the unique method description: the upper bound is relevant when all factors are built-in of order one, I (1) and the lower bound is relevant when all the factors are stationary, I (0).

Therefore, when the calculated t-statistics and f-statistic at 1%, 2,5%, 5%, and 10% substantial levels are greater than the crucial upper bound then the nullified speculation is refused and there is long-term cointegration. However, if the calculated t-statistic and f-statistic are below the lower bound then the nullified speculation will be accepted as there will be no cointegration. In a scenario where the f-statistics and or the t-statistic is amongst the lower bounds l (0) and the upper bounds l (1), no clear conclusion can additionally be done. Pesaran et al (2001) opines that the drawback of this mannequin is that it is inappropriate in instances where greater than one cointegrating vector is used.

After detecting the existence of a cointegrating relationship via the capacity of the use of bounds F statistic, the long-term coefficients of the autoregressive distributed lag mannequin for the S&P 500 stock market can be estimated. As a closing step, we gather the estimated influence of gold prices, oil costs, and United States dollar index on the S&P500 stock market in the United States will be performed by employing the dynamic least-squares that was initiated by McCoskey and Kao (1998) with fully modified least-squares that was put forward by McCoskey and Kao (1998), and Pedroni (2000). The writers observed that the dynamic least squares are far less biased compared to the ordinary least squares. It is additionally really important to bring up that the dynamic least squares and the canonical cointegrating regression which supports the fully

modified least-squares mannequin which possesses superior properties on the variables in assessment.

Hence, utilizing the cointegration techniques is of top-notch significance in this admire considering it allows for the verification on whether or not there exists a long-runequilibrium association amongstthe factors, or not. Glaring at this difficulty from the statisticians' opinion, discovery may be concluded that long-term equilibrium association suggests that the factors advance collectively as time goes on. To rephrase it, if the sequence includes a unit root, it will then be beneficial to implement the cointegration checking out approach.

Therefore, to achieve the evaluation of the long, term co-integrating vector amongst gold costs, oil fees, United States dollar index, and S&P 500 stock market, we use the estimator DOLS with the aid of a Panel initiated by Kao and Chiang (2000). Afterward, keep in thought that the established factor is structurally associated with the independent factors and understanding that a long-run equilibrium association "r" exist-in between these factors, we consequently advance in estimation of the function by implementing the fully modified least squares technique that is appropriate for the statistics in a heterogeneous co-integrated panel (Pedroni, 2000). FMOLS takes hold of the difficulty of non-stationary independent factors as well as the bias challenges.

Diagnostic tests. The exhortation of the research is vain with the absence of confirming the steadiness of the parameters. Several adjustments may have happened in research duration to check the adjustments that have possessed one-of-a-kind statistical methods to check the balance of our model. First, we employed the ARDL CUSUM diagram. CUSUM is the acronym of cumulative sum while CUSUM rectangular represents cumulative sum square. If the red line of the estimated graph cross inside 2 blue lines that points out the steadiness of parameters. Hence, if the red line crosses any of the blue lines it indicates that an unexpected change took place in the selected period. Furthermore, Ramsey RESET is employed to test whether or not the regression model is stable, and Serial Correlation LM test.

Several econometric models may be used to examine the long-term association between the estimated variables. Hence, this research used the model of FMOLS that was put

forward by Phillips and Hansen (1990), DOLS, and CRR. The mentioned models can only be utilized when the variables are stationary at first difference l (1). Hence the FMOLS, DOLS, and CRR will be applied to investigate the long-term elasticities.

DOLS Model. Due to the reason of estimating the long-term cointegration vector amongst the variables, we lodge to the usage of the approach "DOLS". The dynamic least squares estimator is specified consequently by using the below function.

$$Y_{it} \quad = \quad {}_i \quad + \quad x_{it} \quad + \quad \sum_{j=q1}^{q2} C_{ij} \quad x_{it+j} \quad + \quad V_{it}$$

(12)

Where:

i= 1 n denotes the nation

t+1 t denotes the time period

q1 denotes the highest detains

q2 denotes the highest condution

v_{it} denotes the Gaussian error vector

y_{it} denotes the vector for all i and j depended variable

x_{it} denotes a vector of independent variables.

FMOLS Model. FMOLS method deals with the trouble of non-stationary independent factors and the bias challenges. The ordinary least square estimator is recognized for having biased outcomes due to the fact the independent factors are, in general, decided endogenously in any situation of the presents of built-in factors in order 1. Hence, the FMOLS estimator is given consequently by using the following equation

$$Y_{it} = {}_i + x_{it} + e_{it} \quad (13)$$

And

$X_{it} = x_{it-1} + {}_{it}$ (14)

Having the same explanations of factors as the dynamic least of squares.

The benefits of the usage of the DOLS and FMOLS are that they are optimum to different regression models used to estimate the elasticities and regression of coefficients. Due to their added gain, these two models can overcome the trouble of serial correlation and endogeneity. And the outcomes are superior, extra sturdy, and free from correlation and endogeneity.

CHAPTER 1V

Findings and Discussion

$X_{it} = x_{it-1} + {}_{it}$ (14)

Introduction

Chapter four constitutes an extensive outcomes examination of the collected data that encompasses: descriptive statistics, the outcomes of the unit root test of stationary, ARDL bounds tests, ARDL long-run tests, ARDL short-run ECM tests. Moreover, this chapter also reveals the outcomes of the diagnostic examination of serial correlation, model specification, and the stability test. Furthermore, the outcomes of short-run ARDL tests, DOLS, FMOLS, and CRR tests are discussed.

Table 1.

Descriptive Statistics

Variable	Stock prices	Gold costs	Oil fees	USD index	Covid 19
Mean	2183.654	1431.773	69.43798	88.75872	0.145963
Median	2066.130	1364.400	67.61000	91.29800	0.000000
Maximum	4629.260	2061.400	113.9300	103.5020	1.000000
Minimum	879.1300	912.2000	16.94000	73.10700	0.000000
Standard dev	869.4045	229.4921	21.96953	8.170378	0.353343
Skewness	0.752325	0.503811	0.098204	-0.179725	2.005486
Kurtosis	3.012254	2.523173	1.903824	1.525572	5.021973
Jarque-Bera	60.75390	33.34486	33.27813	61.80094	541.3965

Table 1 (Continued).

Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1406273	922061.8	44718.06	57160.62	94.00000
Sum Sq.Dev	2.86E+08	33864639	310350.5	42923.51	80.27950
Observations	644	664	664	644	644

Table 1 above indicates the result of gold prices, oil prices, United States dollar index, Covid 19, and S&P 500 stock market prices in the United States from July 2009 to January 2020. This table revealed properties namely mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jaque-Bera, probability, sum, sum standard deviation, and the number of observations. These statistical records help to apprehend the meaning of the analyzed data.

Mean shows the average fee of observations corresponding to examined variables. Median specifies the center value of observations in the statistics set and this measure is much less sensitive to outliers in the records in contrast to the mean. More so, maximum suggests the maximum value while minimum indicates the minimal cost of the observations in the records set. Standard deviation computes the dispersion in the examined sequence. Skewness for stock prices, gold prices, oil prices, and Covid 19 are positive which indicates that the tail on the graph is on the right. however, for the USD index skewness is negative meaning that the tail on the graph is on the left. Kurtosis less than 3 for gold prices, oil prices, and USD index reveals that the graph is flatter, for S&P 500 since it is equal to 3 it means that the graph is normally distributed and for Covid 19 since it is above 3 this reveals that the graph is a tunnel.

Table 2.

Unit Root Tests Results

Variable	ADF test			PP test		
	Level	1st difference		level	1st difference	
	t-Statistic	t-Statistic		t-Statistic	t-Statistic	
Stock Prices	1.108930	-27.41874	I(1)	2.017546	-27.99793	I(1)
	(0.9976)	(0,0000)		(0.9999)	(0.0000)	
Gold Prices	-2.196213	-26.25751	I(1)	-2.081374	-26.44864	I(1)
	(0.2080)	(0.0000)		(0.2524)	(0.0000)	
Oil Prices	-1.631881	-23.46537	I(1)	-1.866865	-23.51032	I(1)
	(0.4656)	(0.0000)		(0.3481)	(0.0000)	
USD Index	-1.542172	-27.14146	I(1)	-1.430648	-27.18301	I(1)
	(0.5117)	(0.0000)		(0.5681)	(0.0000)	
Covid 19	-0.410940	-25.33772	I(1)	-0.410940	-25.33772	I(1)
	(0.9046)	(0.0000)		(0.9046)	(0.0000)	

Note: probability values in parentheses

The preliminary beginning in the time sequence method is to become aware of the stationarity integration of the factors to be evaluated. Several macroeconomic sequences are observed to possess unit roots as they however now non-stationary or their variances amplify as time goes on Hence, unit root examination is the first approach to examine the stationary of the time collected statistics. Therefore, if a factor is not stationary it means that it has a unit root thus, it presents a challenge of spuriousness especially if the ordinary least squares technique is to be employed. Thereby, it is very crucial to test the

stationarity properties of the time series factors earlier than implementing the autoregressive distributed method.

Above all, the stationarity technique is needed in this research to verify that all variables are either stationary at level or first difference only so that cointegration association can be carried out employing the autoregressive distributed lag approach. In this thesis research, the unit root examinations were performed using the Dickey and Fuller. (1981) (ADF) and the PP tests. Unit root outcomes that are proven in Table 2 above confirm that all of the variables are stationary at the first difference and none of the factors observed the second difference using both of the methods. The outcomes in addition published that gold costs, oil fees, United States dollar index, Covid 19, and S&P 500 stock market prices in the United States are stationary at a level I (1). This is evidenced by the probability values that are more than 0,01 at level but been stationary at 1st difference with the probability values of 0.000 Hence we are positive to practice the ARDL model.

Table 3.

ARDL Bounds Tests Results

Test statistics	values	10% critical level		5% critical level		2.5% critical level		1% critical level	
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F-statistic	5.760529	3.03	4.06	3.47	4.57	3.89	5.07	4.4	5.72
t-statistic	-5.175692	-3.13	-4.04	-3.41	-4.36	-3.65	-4.62	-3.96	-4.96

After determining the unit root results examination of gold costs, oil fees, United States dollar index, Covid-19, and the S&P 500 stock market, it is vital to decide the presents of a long-term association amongst these factors. Considering that the order of

integration evaluation without a doubt suggests that all the four factors are stationary at the first difference I (1), it is suitable to employ the ARDL F-statistic and t-statistics strategy to establish the long-term cointegrating association amongst these factors. Table four above truly revealed the outcomes of the autoregressive distributed lag F-statistics and t-statistics to reveal the cointegrating association amongst the factors. Where T-statistic regresses all the variables at the same time, whereas t-statistic is employed when testing one variable.

The effects of this examination strategy affirm the presents of a long-run connection between gold costs, oil fees, United States dollar index, Covid 19, and S&P 500 stock market prices in America. The results divulge that the calculated F-statistics of 5.760529 is for sure above the lower bound l (0) and the upper bound I (1) critical value at 10%, 5%, 2.5%, and 1% statistical level. Given that the F-statistic value is above the lower bound and upper bound values of 4.4 and 5.72 respectively. Thus, the nullified speculation of no cointegration is declined to designate that there is a steady long-term cointegrating connection amongst gold costs, oil fees, United States dollar index, Covid-19, and S&P 500 stock market prices in America at 1% using the l (0) and I (1) outcomes and at 1% significant level.

More so, the results revealed that the calculated t-statistics of -5.175692 is higher than the lower bound and the upper bound of -3.96 and -4.96 respectively at a 1% significant level which validate the presents of a long-term connection amongst these variables. Therefore, the null hypothesis that states that there is no cointegration is rejected at a 1% significant level.

Table 4.

ARDL Long Run Results

Variable	Coefficient	Std-Error	t-statistic	P-value
LGP	-0.268487	0.075820	-3.541129	0.0004

Table 4 (Continued).

LOP	0.233464	0.052533	4.444109	0.0000
LUSDI	0.317431	0.293020	1.0833008	0.2791
Covid 19	0.157869	0.043988	3.588877	0.0004

Table 4 above estimates the coefficient of the long-term connection using the ARDL approach. The model selection criteria used is Schwarz criterion, coefficient covariance matrix HAC (Newey-West) with a maximum lag of 12. According to the outcomes in the table above, in the long term, gold priceshave a negative significant impact on S&P 500 stock market, oil fees have a positive significant impact on the S&P500 stock market, the USD index has a negative statistically insignificant effect of the S&P 500 stock market and Covid 19 has a positive statistically significant effect on the S&P 500 stock market in the United States. The estimated coefficient of gold prices is -0.268487. This expresses that a 1% increase in the gold price will decrease the S&P 500 stock market by 0.27%. The coefficient of gold prices is statistically significant at the 1% level as indicated by the probability value of 0.0004. The estimated coefficient of oil prices is 0.233464. This means that a 1% increase in oil price will result in an increase of the S&P 500 stock market by 0.23%. The coefficient of oil prices is statistically significant at a 1% significant level as evidenced by the probability value of 0.0000. The estimated coefficient of the USD index is 0.317431. This implies that a 1% increase in the USD index will amplify the S&P 500 stock market by 0.32%. However, the coefficient of the USD index is not statistically significant at 10% or 5% or 1% given that the probability value is 0.2791. Covid-19 has a statistically significant positive effect on the S&P 500 stock market given that the probability value is 0.0004. And is statistically significant at 1%.

Table 5.

ARDL Shorn Run Results

ARDL Error Correction Regression

Dependent Variable   LS&P

Variable	Coefficient	Std-Error	t-statistic	P-value
LS&P$_{t-1}$	-0.086395	0.040640	-2.125892	0.0339
LS&P$_{t-2}$	0.071893	0.040557	1.772629	0.0768
LS&P$_{t-3}$	-0.055219	0.040564	-1.361282	0.1739
LS&P$_{t-4}$	-0.056673	0.039942	-1.418883	0.1564
LGP	-0.003792	0.040148	-0.094455	0.9248
LGP$_{t-1}$	0.045523	0.039946	1.142428	0.2537
LGP$_{t-2}$	-0.005224	0.039848	-0.131237	0.8956
LGP$_{t-3}$	0.061666	0.039804	1.548100	0.1221
LGP$_{t-4}$	-0.089511	0.039631	-2.258599	0.0243
LOP	0.177098	0.016146	10.96839	0.0000
LOP$_{t-1}$	-0.000938	0.017541	-0.053476	0.9574
LOP$_{t-2}$	0.006224	0.017429	0.357106	0.7211
LOP$_{t-3}$	0.008934	0.017369	0.514398	0.6072
LOP$_{t-4}$	-0.005437	0.016998	-0.319832	0.7492

Table 5 (Continued).

LUSDI	-0.383329	0.086541	-4.429448	0.0000
$LUSDI_{t-1}$	0.116141	0.087837	1.322243	0.1866
$LUSDI_{t-2}$	0.071438	0.087508	0.816351	0.4146
$LUSDI_{t-3}$	0.058810	0.087765	0.670085	0.5031
$LUSDI_{t-4}$	0.049322	0.087959	0.560739	0.5752
C19	0.006840	0.019513	0.350551	0.7260
$C19_{t-1}$	-0.020121	0.019528	-1.030391	0.3032
$C19_{t-2}$	0.035353	0.019551	1.8088261	0.0711
$C19_{t-3}$	0.011513	0.019560	0.588634	0.5563
$C19_{t-4}$	-0.023409	0.019585	-1.195268	0.2324
ECT_{t-1}	-0.066644	0.016765	-3.975128	0.0001
C	0.593216	0.132851	4.465263	0.0000
@Trend	0.000171	3.86E-05	4.436407	0.0000

Once we discover the ARDL bounds exam, the next step is to evaluate the short-run dynamic association amongst gold prices, oil prices, US dollar index, Covid 19, and S&P 500 stock prices. This is examined by employing the ARDL error correction regression with the model selection criteria of Akaike info criterion, ordinary covariance matrix, and a maximum lag of 4. The dependent variable used has been the S&P 500 stock prices while gold fees, oil prices, US dollar index, and Covid 19 were employed as

the explanatory variables. The outcomes of the short-term dynamics of the autoregressive distributed lag model are stated in Table nine above. There is a positive short-run insignificant connection amongst gold fees and S&P 500 stock costs in the United States. This is evidenced with the aid of the probability of 0.9248 which means that it is not statistically significant at either 1% or 5% or 10% significant level.

Furthermore, the results additionally exhibit the existence of a short-term significant relationship amongst oil prices and the S&P 500 stock market costs in the United States and it is statistically significant at a 1% level given that the likelihood is 0.0000. An increase in the 1 percentage of oil expenditures will amplify the S&P 500 stock costs in America by 0.18 percent. More so, the effects confirmed the presents of a negative statistically significant association amongst the US dollar index and S&P 500 stock market costs in the United States this is evidenced by the probability of 0.0000 which is statistically significant at a 1% significance level. Thus an enlarge in 1 percent of the USD index will result in the reduction of 0.38 percent of the S&P 500 stock market prices in America. However, in the short run, Covid 19 has a positive statistically insignificant impact on the S&P 500 given that the probability value is 0.7260, which is not statistically significant on 10% or 5% or 1% significant level. In addition, the error correction term specification is statistically significant at 1% since the probability value is 0.0001.

Table 6.

Serial Correlation LM Test Result

Breusch-Godfrey Serial Correlation LM Test.

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.428005	Prob. F (2.626)	0.6520
Obs*R-squared	0.869753	Prob. Chi-Square (2)	0.6473

Table six above gives the residual diagnostic assessments for gold charges, oil fees, United States dollar index, and S&P 500 stock market costs in America using the serial

correlation LM examination. This research used the Breusch-Godfrey LM tests. The nullified speculation states that there is no serial correlation and with the likelihood fee of 0.65 for serial correlation, we can accept the nullified speculation that there is no serial correlation. Hence our mannequin is free from autocorrelation

Table 7.

Ramsey Reset Tests Results

Ramsey Reset Test

	Value	df	Probability
t-statistic	0.187741	632	0.8511
F-statistic	0.035247	1.632	0.8511
Likelihood ratio	0.035803	1	0.8399

Table 11 above presents the residual diagnostic tests for gold fees, oil charges, United States dollar index, and S&P 500 stock market costs in the United States. The Ramsey reset assessments have been used for model specification. Hence Ramsey Reset indicates that the likelihood is 0.68 and this proves that the model is specified well. Hence, the effects of this research are reliable, valid, and robust.
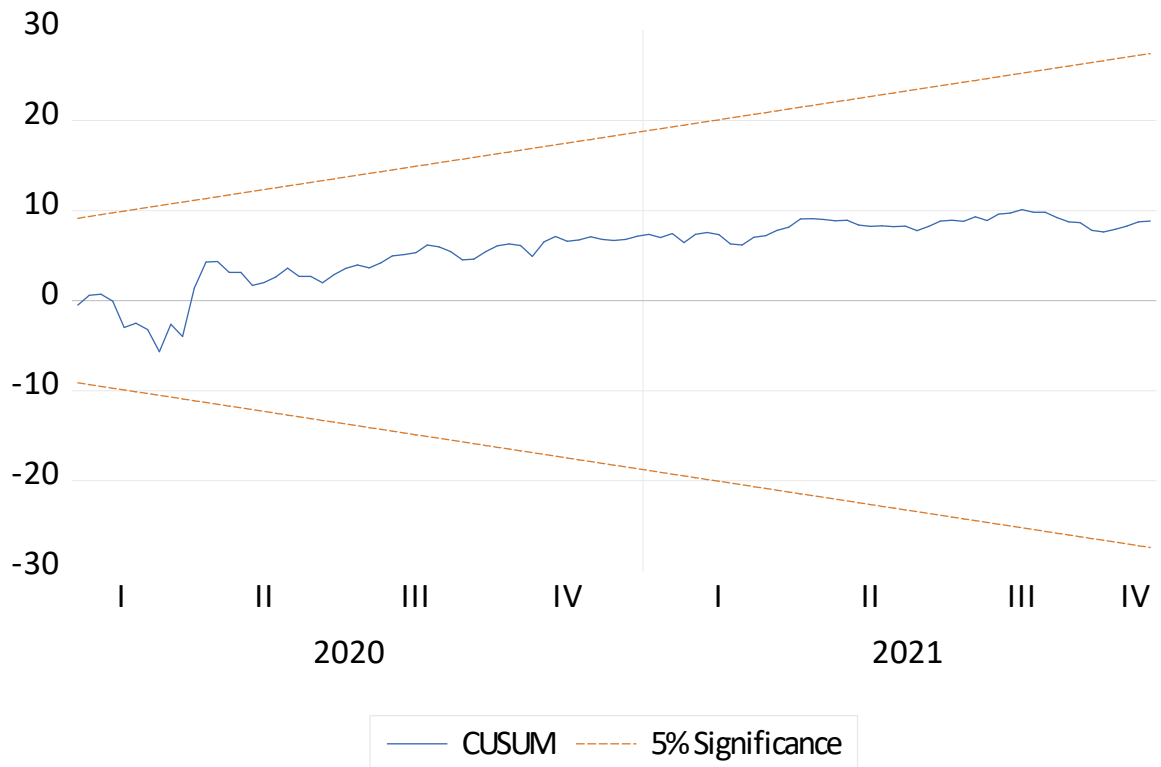
Figure 6

CUSUM Tests Results

Figure 5 above reviewed the outcomes of the CUSUM stability checks of the ARDL used in this study. Using dependent variables of the S&P 500 stock market and explanatory variables of gold costs, oil fees, US dollar index, and Covid 19 the CUSUM graph shows that parameters are stable at a 5% significant level as evidenced by the blue line which lies in between the two red lines.

Table 8.

FMOLS Tests Results

Dependent Variable LS&P

Method: Fully Modified Least Squares (FMOLS)

Cointegrating equation deterministic: C @TREND

Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 7000)

Variable	Coefficient	Std-Error	t-statistic	P-value
LGP	-0.249856	0.043486	-5.745665	0.0000
LOP	0.198353	0.027017	7.341772	0.0000
LUSDI	-0.176285	0.155075	1.136774	0.2561
Covid 19	0.103287	0.33560	4.578321	0.0000
C	7.077424	0.893603	7.920095	0.0000
@Trend	0.002212	6.91E-05	32.03510	0.0000

The Fully Modified Least Squares (FMOLS) technique was used to consider whether or not there is a long-run association amongst gold prices, oil fees, United States dollar index, Covid 19, and S&P 500 stock market prices in America. The results revealed that there exists a long-run negative association amongst gold prices and the S&P 500 stock prices in the United States and it is statistically significant at 1% given that the probability value is 0.0000. An increase in one percent of gold will decrease the S&P 500 stock prices in America by -0.25%. Additionally, there exists a positive long-term

association between oil fees and S&P 500 stock market in the United States, and it is statistically significant at 1% evidenced with the probability value of 0.0000. An increase in one percent of the oil fee will amplify the S&P 500 stock market by 0.20%.

However, there does not exist a long-runconnection amongst the US dollar index and the S&P 500 stock market in the United States since the probability value is not statistically significant at 1% or 5% or 10%. Because the probability value is 0.2561. An increase in one percent of the exchange charge will decrease the S&P 500 stock market by -0.18%. More so, in the long-run Covid 19 has a positive impact on the S&P 500 given that the probability value is 0.0000 which is statistically significant at a 1% significant level. Furthermore, the constant and the trend is statistically significant at 1% given the probability value is 0.0000. Therefore, the outcomes of this thesis are superior, more robust, free from correlation and endogeneity.

Table 9.

DOLS Tests Results

Dependent Variable LS&P

Method: Dynamic Least Squares (DOLS)

Cointegrating equation deterministic: C @TREND

Fixed leads and lag specification (lead=1, lag=1)

Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 7000)

Variable	Coefficient	Std-Error	t-statistic	P-value
LGP	-0.248857	0.044501	-5.592202	0.0000
LOP	0.193059	0.029395	6.567758	0.0000
LUSDI	0.139384	0.166097	0.839169	0.4017

Covid 19	0.098739	0.023623	4.179786	0.0000
C	7.255074	0.949093	7.644218	0.0000
@Trend	0.002223	7.15E-05	31.07697	0.0000

The outcomes of this estimation enable us to observe in the 2nd model DOLS which is applied to confirm the robustness of the FMOLS. The Dynamic Least Squares (DOLS) technique was used to consider whether or not there is a long-run association amongst gold prices, oil prices, US dollar index, Covid 19, and S&P 500 stock market in the United States. The results confirmed a negative long-term association amongst gold prices and the S&P 500 stock prices in America and

it is statistically significant at 1% given that the probability value is 0.0000. An increase in one percent of gold will decrease the S&P 500 stock market by -0.25%

In addition, there also exists a positive long-term association between oil prices and the S&P 500 stock prices in America, and it is statistically significant at 1% evidenced by the probability value of 0.0000. An increase in 1 percentage of oil prices will amplify the S&P 500 stock market by 0.19%. However, there is no long-term association between the US dollar index and the S&P 500 stock prices in America since the probability value is 0.4017 and is statistically insignificant at 10% or 5% or 1%. Furthermore, it can be confirmed that there exists a long-run positive connection amongst Covid 19 and S&P 500 stock market in the United States given that the probability value is 0.0000. And it is statistically significant at 1% level

Table 10.

CRR Tests Results

Dependent Variable LS&P

Method: Canonical Cointegrating Regression (CCR)

Cointegrating equation deterministic: C @ TREND

Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 7000)

Variable	Coefficient	Std-Error	t-statistic	P-value

Table 10 (Continued).

Variable	Coefficient	Std-Error	t-statistic	P-value
LGP	-0.249445	0.043191	-5.775452	0.0000
LOP	0.198638	0.027170	7.310939	0.0000
LUSDI	-0.178089	0.156125	-1.140683	0.2524
Covid 19	0.103375	0.022680	4.558007	0.0000
C	8.590937	0.896896	7.877492	0.0000
@Trend	0.002389	6.93E-05	31.91129	0.0000

The Canonical Cointegrating Regression (CRR) is the 2nd mannequin that is utilized to affirm the robustness of the FMOLS. Canonical Cointegrating Regression (CRR) method was used to consider whether or not there exists a long-term association amongst gold fees, oil expenditures, US dollar index, and S&P 500 stock costs in the United States. The outcomes demonstrated the presents of a negative long-term association between gold prices and the S&P 500 stock costs in the United States and it is statistically significant at 1% given that the probability value is 0.0000. An amplification in one percent of gold will decrease the S&P 500 stock market by -0.25%.

More so, the results confirmed a positive long-term association between oil fees and the S&P 500 stock costs in America, and it is statistically significant at 1% evidenced with the probability rate of 0.000. An increase in one percent of the oil charge will amplify the S&P 500 stock market with 0.20%. However, there is no long-term association

amongst the US dollar index, and the S&P 500 stock market in the United States since it is not statistically significant at 1% or 5% or 10% because the probability value is 0.2524. In addition, in the long run, there exist a positive relation between Covid 19 and the S&P 500 stock market which is evidenced by the probability value of 0.0000 which is statistically significant at 1% level. These effects are superior, extra robust, free from correlation and endogeneity.

Summary. This research thesis mainly concentrated on the short-run and long-run variations. This research employed the autoregressive distribution cointegration estimation to evaluate the F-statistic and t-statistic bounds tests, long-run results, and short-term error correction results. Furthermore, it used the FMOLS in line with the DOLS and CRR to affirm the robustness. In the short run, gold prices and Covid 19 are statistically insignificant whilst oil prices and the USD index are statistically significant. Furthermore, the diagnostic assessments proved that the results of this mannequin are reliable, valid, and robust. And in the long term, gold prices negatively affect the S&P 500 in the United States are statistically significant at a 1% significant level using the FMOLS and the ARDL model. Oil prices positively impact the S&P 500 stock market and are statistically significant at 1% using both models. COVID-19 positively affects the S&P 500 stock market and it is statistically significant at 1% using the ARDL and FMOLS models. However, the USD index does not affect the S&P 500 stock market, in the long term, using both of the models.

Chapter V

Conclusion and Recommendations

Introduction

This chapter concluded the research and it also gave recommendations in case future studies may be done.

The essential goal of this thesis was to evaluate the association between gold prices, oil prices, United States dollar index, Covid 19, and S&P 500 stock market in America. This thesis adopted the ARDL bounds tests, ARDL long-run tests, ARDL ECM model, FMOLS, DOLS, CRR, and three diagnostic assessments to estimate the affiliation and influence of the dependent factor (S&P 500) and the explanatory factors that include gold prices, oil fees, Covid 19, and US dollar index. This thesis used time sequence weekly statistics of thirteen years beginning from July 2009 after the global financial crises that ended in June 2009 to 31 October 2021 to evaluate the present-day situation. And a dummy variable was used for coronavirus.

According to the descriptive statistics outcomes of this research, gold prices, oil fees, and the US dollar index have the kurtosis which is less than three. Hence the diagram will be flatter. However, for S&P 500, considering that the kurtosis is equal to three it means that it is not normally distributed. For Covid 19 the kurtosis is more than three provide evidence that the diagram will be a tunnel. Furthermore, using the skewness results, S&P 500 stock market, gold expenses, and oil fees have a tail on the right because the results are positive, and for the US dollar index, the tail is on the left side since the kurtosis results are negative.

Similarly, Sheikh et al. (2020), the unit root for all variables that encompass stock prices, gold prices, oil prices, US dollar index, and Covid 19 turn out to be stationary at first difference. Thereby H (1) was prevalent whereas H (2) was rejected. This thesis employed the Augmented Dickey-Fuller (ADF) checks &Phillips and Perron (PP) tests. S&P 500 stock market prices, gold prices, oil fees, and USD index were all stationary at first difference as well. Hence rejecting the null which states the absence of unit root at a level and accepting the H (1) that says that there is no unit root at first difference. Based on these unit root outcomes we had been positive to implement the ARDL model and the FMOLS, DOLS, and CRR methods. ARDL mannequin requires that the unit root ought to be stationary at either level or first difference or the combination of the two l (0) and l (1). And if there is a unit root problem then FMOLS, DOLS, and CRR techniques can be used.

Like the outcomes of Khin et al. (2018, Houcine et al (2020), and Gokmenoglu and Fazlollahi (2015) there exist a long-term association amongst stock market prices, gold prices, oil expenditures, and the US dollar index. This research also discovered that there is a long-run affiliation amongst S&P 500 stock costs, gold fees, oil prices, and US dollar index using the ARDL bounds test assessments model. The F-statistic indicated the existence of a long-term connection amongst these factors and it is statistically significant at 1% using I (0) and statistically significant at 2.5% using I (1). The T-statistic also indicated the existence of the long-term relationship between these variables and is statistically significant at 1% using both I (0) and I (1).

This thesis is additionally supported by Gokmenoglu and Fazlollahi (2015) who discovered that in the short term gold has no impact on stock market prices. This research also observed that gold prices do not affect the S&P 500 stock market prices in the short term considering that the probability value was not statistically significant. This implies that traders may be reluctant to switch their cash to supplementary different markets in the short term. However, investors react to gold costs in the long run.

More so, in the short term, this study highlighted in the short run that there a superb and statistically great influence of oil costs on the S&P 500 stock market prices in America, in a similar way to Gokmenoglu and Fazlollahi (2015), Alshammari et al. (2020) and

Tursoy and Faisal (2018). Hence the S&P 500 companies' stock prices would increase if the prices of oil rises. For instance, if the oil costs in the United States will increase by one percent, the S&P 500 stock market fees will amplify by 0.17 percent, given that 10% of the S&P 500 stock market belongs to the energy sector organizations. Therefore, any rise in oil prices will also increase the stock prices.

In addition, this research additionally discovered that there is a negative statistically significant influence of the United States dollar index on S&P 500 stock market prices in the United States. These outcomes followed and advocate the justification of prior research by Ali et al. (2021). Which verified the presence of a poor effect amongst the stock prices and the United States dollar index. For example, a one-percent increase in the dollar US dollar index America will reduce the S&P 500 stock market prices in the United States by 0.38 percent. Due to hyperinflation, the real value of shares when compared to other currencies would decrease.

The diagnostic exams using the ARDL model suggested the absenteeism of serial correlation amongst these variables, the Ramsey Reset exams endorse that this research mannequin is stable. Collaborated with the results of the diagnostic examinations, this proposes the stability of this study. These diagnostic assessments in addition affirm that these outcomes are reliable, sturdy, and valid. These outcomes are inconsistent with and support the opinion of the preceding research by Tursoy and Faisal (2018) which additionally established the absence of serial correlation and steadiness of the mannequin using the Ramsey Reset checks.

Following the research by Tursoy and Faisal (2018) also gives proof that there is a long-run negative statistically significant connection amongst gold fees and stock prices and a positive statistically significant association amongst oil prices and the stock market using the FMOLS, DOLS, and CRR approach. This thesis additionally confirmed the identical results. To add on, this thesis also verified that in the long-term gold prices have a negative impact on the S&P 500 since gold is known to be a traditional substitute for the stock market. Hence a rise in gold prices might result in the traders withdrawing their money from the stock market, which results in the decline of the S&P 500 stock market. And they can hedge themselves against inflation.

And oil fees have a high effect on the S&P 500 stock market because 10% of the S&P 500 stock market belongs to the energy sector companies. Consequently, it can be noted that commodity expenditures play an essential function and have an effect on the stock market in the United States.

Similarly, to different prices, gold expenditures and oil fees are tremendous warning signs for the traders, and, primarily established on these measures, traders review their portfolios or fundings. Particularly, gold offers a possibility for traders to move their investments from stocks to the gold market or crude oil market in contemplation to defend their selves from viable funding dangers.

In regards to the Covid 19 dummy variable, in the short run, it did not affect the S&P 500 stock market. However, in the long run similarly to Kusumahadi and Permana (2021), coronavirus had a positive effect on the S&P 500 and it was statistically significant due to companies like Microsoft, Amazon, and Facebook that were not affected by this pandemic. Nonetheless, the effect of coronavirus on the stock market is small in the United States. Because of our discoveries, we urge researchers to direct more in-depth investigations of the factors that influence stock market instability, particularly during pandemics, in light of the fact that different elements other than the occurrence of COVID-19 might influence stock markets. For instance, factors such as the number of cases, the number of deaths, the death rate, and the public authority's reaction to the COVID-19 might affect the stock market.

Advises for the authorities are specified to offer additional focal points on economic policies for gold costs, crude oil fees, US dollar index and stock costs to execute stability in America. This research is extensively advantageous to the government, policy, decision-makers, and investors since they can establish and apprehend the movements of the gold costs, oil fees, US dollar index, and stock market prices in the economy More so, this research has a lot benefits for investors either to make investments in financial property or real assets.

It additionally presents a tenet to the policymakers and analysts to think about these macroeconomic variables for the exceptional interest of all stakeholders. The outcomes

of this thesis are vital suggestions for the United States portfolio management, in conjunction with financial risk management. Furthermore, these results afford a few indicators to monetary and fiscal policies, thinking about the stress crude costs, gold fees, and exchange US dollar index create on the S&P 500 stock market prices in America.

Recommendations for Future Studies. In the future, this research will additionally be carried out by using different models with distinctive macroeconomic variables. Further, it can also be studied throughout the United States for comparative analysis. The future study directions continually provide intuition to the new analysts. It is counseled that several macroeconomic factors may be incorporated that possess an immediate influence on the stock market prices. This includes macroeconomic factors such as consumer price index, discount rates, the continuous rising of prices (Inflation), which may be included in the study to evaluate their effects on stock market prices.

More so, Further research may also reflect on consideration on other commodities, such as natural gas and two different currencies, to re-evaluate the equal association, and may want to locate more robust outcomes to manage the stabilized portfolio impacts. The outcomes possess sizable suggestions for expert traders and the government to advance a beneficial and realistic policy to smooth the volatilities from commodities to domestic factors. Political disruptions, exchange deficiency, and acquiring of the international monetary fund's back-to-back applications hastily increased the US dollar indexes.

Future studies need to be carried out on comparing the outcomes of developed international locations such as Canada or the United Kingdom. Also in addition research ought to be performed in developing countries as well such as Sri Lanka, Bangladesh, and South Africa simply to point out a few. The different mannequins can additionally be used other than the ARDL, FMOLS, DOLS, and CRR. These models encompass NARDL, VAR, GARCH, and Granger Causality tests.

At last, further examination is expected to help understand the antagonistic effect of coronavirus on the stock markets through concentrating on the channels by which coronavirus sends the fear to these markets and revealing insight into the contingent

relationships between these business sectors and the volatility in the worldwide equity market. Also, further examination is expected to research the impacts of COVID-19 on stock at the firm level and to recognize the areas that are for the most part impacted by the pandemic using the total number of confirmed cases and deaths.

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