FINAL PROJECT

Bachelor's degree in Economics

Title: Incidence of macroeconomic variables on the financial markets of the OECD countries

Author: Marc Albareda Farré

Tutor: Esteve Sanromá Meléndez

Department: Public Economy, Political Economy and Spanish Economy

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UNIVERSITAT DE BARCELONA

Facultat d'Economia i Empresa

ABSTRACT

The final degree project analyzes the influence of macroeconomic variables on the financial markets of the OECD countries. The relationship between economic growth, inflation, and long-term interest rates with stock prices. The results show the existence of significant relationship between these variables, which indicates that macroeconomic factors have a significant impact on the dynamics of financial markets. It is shown that higher economic growth is associated with an increase in share prices, that inflation has a negative impact on financial markets, and that the variation of long-term interest rates directly affects the financial markets. All these findings provide valuable insights for investors and policy makers, enabling more informed and strategic investment decision-making.

Keywords: macroeconomic variables, financial markets, OECD countries, GDP, inflation, long-term interest rate, stock market.

TÍTOL

La influència de les variables macroeconòmiques en els mercats financers dels països de l'OCDE

RESUM

El treball de fi de grau analitza la influència de les variables macroeconòmiques en els mercats financers dels països de l'OCDE. La relació entre el creixement econòmic, la inflació i els tipus d'interès a llarg termini amb els preus de les accions. Els resultats mostren l'existència d'una relació significativa entre aquestes variables, la qual cosa indica que els factors macroeconòmics tenen un impacte significatiu en la dinàmica dels mercats financers. Es demostra que un creixement econòmic més elevat està associat a un augment dels preus de les accions, que la inflació té un impacte negatiu en els mercats financers i que la variació dels tipus d'interès a llarg termini afecta directament els mercats financers. Totes aquestes troballes proporcionen informació valuosa per als inversors i els responsables polítics, que permeten una presa de decisions d'inversió més informada i estratègica.

Paraules clau: variables macroeconòmiques, mercats financers, països de l'OCDE, PIB, inflació, tipus d'interès a llarg termini, borsa.

INCIDENCE OF MACROECONOMIC VARIABLES ON THE FINANCIAL MARKETS OF THE OECD COUNTRIES

WORK STRUCTURE

I.   INTRODUCTION

1. PURPOSE/OBJECTIVE OF THE WORK:

This work sets out to answer the question of whether macroeconomic variables have an impact on the financial markets of OECD countries.

In order to achieve results in the study that allow me to draw a truthful, precise, and high-level conclusion about the content, I have structured the work in different parts.
A first part includes an introduction to the key aspects of the work, as well as a detailed introduction to the hypothesis it raises.

Then we enter the theoretical framework, to provide basic knowledge about financial markets, macroeconomic variables, and the historical relationship that has existed between both variables. This section will be key to help understand what the objective of the work is and what its significance is, which will give rise to the practical framework.

The broader part is the practical and methodological part which, through the hypothetico-deductive method, aims to answer the hypothesis raised above and find out if the macroeconomic variables really have a great impact on the financial markets of the OECD countries. To do this, I wanted to study the relationship between the stock market and the economy at a macro level through financial asset valuation models and econometric calculations on the relationship that is between the two variables studied. In the second place of the practical study, I wanted to analyze the financial markets through fundamental analysis and technical analysis (the two main methods of market analysis) with the application of macroeconomic variables. After analyzing the general data, I wanted to focus on the comparison that there may be of this incidence between countries of the Organization for Economic Cooperation and Development (OECD), I find it very interesting to make this classification since it will allow me to see the effects in different countries to be able to draw conclusions.

To end the practical part, I intend to have interviews with experts, taking advantage of the contacts I have made during these years in the sector, financial market professionals, university professors I have had and professors I will have in the future, since my next academic milestone is the completion of a master's degree in Stock Exchange and Financial Markets at one of the leading universities in Europe. I think that conducting interviews with experts will allow me to give the work a more analytical part through the opinion of people who devote all their time to the analysis of financial markets and to the study of the factors that can to influence.

The work concludes by pooling the results obtained during the process and obtaining conclusions to give an answer to the main hypothesis and see if it is true that macroeconomic variables have an impact on financial markets. In the event that this relationship is true, I intend to provide precise data on what is the value of this relationship between the variables obtained and what are the factors that make the incidence vary between the different OECD countries.

I intend that the results obtained from this work will allow in the future to make a more specific analysis on the financial markets and that it can be of help to predict the impact of macroeconomic variables, -as it can be, for example, the announcement of a rise in interest rates-, in the financial markets of the OECD countries.

2. MOTIVATION:

In the fascinating world of finance, macroeconomic variables play a fundamental role in understanding and predicting the movements of financial markets. My research work focuses on the incidence of these macroeconomic variables in financial markets, and I invite you to immerse yourself in this exciting field in which the economy, investments and strategic decision-making are intertwined.

Have you ever wondered why stock prices go up or down? Are you interested in understanding how economic forces can influence financial markets? If so, my work on the incidence of macroeconomic variables in financial markets will offer you a deep and enriching vision of this highly relevant topic.

The motivation behind this work lies in the importance of understanding how large-scale economic factors can have a significant impact on our investments and the economy in general. Macroeconomic variables, such as economic growth, inflation, interest rates, and other key indicators, are intrinsically linked to movements in financial markets. Understanding this relationship gives us a strategic advantage in making informed investment decisions and allows us to confidently navigate the turbulent seas of finance.

In my research, I have spent time and effort exploring in depth how these macroeconomic variables influence financial markets. By analyzing historical data, using econometric models, and reviewing existing academic literature, I have gained valuable insights into how these variables can affect stock prices, exchange rates, bond yields, and other financial assets.

You will discover that economic growth is a key driver of financial markets. An increase in gross domestic product (GDP) can generate positive expectations among investors and lead to an increase in demand for shares and other financial assets. In addition, inflation, another important macroeconomic factor, can affect asset valuations and real returns. Understanding how inflation impacts the markets will allow you to make more sound decisions and protect your wealth against the effects of inflation.

Long-term interest rates also play a crucial role in financial markets. Changes in these rates can influence the cost of credit, bond yields, and the relative attractiveness of different assets. Exploring how interest rates affect financial markets will help you better understand the opportunities and risks associated with different asset classes and tailor your investment strategies accordingly.

The results of my research have a significant impact in different areas. For investors and traders, they provide a deeper understanding of the forces that drive financial markets and enable them to make informed decisions about where and when to invest their capital. By considering key macroeconomic variables, they can adjust their portfolios and take advantage of opportunities that arise from changes in the economic environment.

Finance professionals and economic policy makers also benefit from these results. Understanding how macroeconomic variables affect financial markets allows them to make more effective decisions to drive economic growth and financial stability. This includes adjusting monetary and fiscal policies, implementing appropriate regulations, and promoting favorable economic conditions.

In addition, this work has an academic impact since it contributes to existing knowledge in the field of economics and finance. The results and conclusions obtained can serve as a basis for future research and debates, thus fostering the development of more accurate and comprehensive theories and models.

II. THEORETICAL FRAMEWORK

1. EXPLANATION OF FINANCIAL MARKETS:

In order to see the relationship between macroeconomic variables and financial markets, we must first analyze the characteristic features of markets and understand how they work.

The main characteristics of financial markets are transparency, freedom, depth, breadth, flexibility, volatility, no associated costs....

The transparency that characterizes financial markets comes from the fact that any investor in the market can obtain information about the assets listed in a transparent manner. Freedom refers to the fact that there is no barrier to entry for trading financial assets, whether buying or selling. The depth and breadth of the market is given by the number of transactions, agents and assets existing in the market itself, the greater the number, the greater the depth. Flexibility is the ability of demand and supply, buyers, and sellers, to buy and sell financial assets. Volatility measures the variation in the price of an asset, with respect to the average during a given period. Financial markets do not have associated costs in the transactions themselves, such as taxes, inflation...

Financial markets are essential to the global economy, as they provide an efficient way to allocate capital and finance companies and projects. However, they can also be volatile and subject to significant price fluctuations, which can be a source of risk for investors. It is therefore important for investors to understand the risks associated with investing in financial markets and to make informed decisions about their investments.

The objective of financial markets is to bring together suppliers and demanders of financial assets, to establish prices for all types of products through the laws that govern the markets, taking into account risk. Another objective, and one of the most important, is to provide assets with the liquidity they need and at the same time reduce the costs involved in the negotiation of these products. In short, its purpose is to channel the savings of families and companies to investment, optimizing resources in the most efficient and transparent way.

1.1. FINANCIAL ASSET ISSUANCE PROCESS

The securities issuance process begins with the company or government entity that wishes to obtain financing. In the case of companies, they may issue stocks, bonds or other securities to finance projects and operations. Governments may issue bonds and other securities to finance infrastructure projects, public services, or social programs.

Securities are issued through an initial public offering (IPO) or a secondary issuance. The IPO is the first time a company issues shares in the market and offers investors the opportunity to buy shares in the company for the first time. In the secondary issuance, the company issues new shares to raise additional financing or existing shareholders sell their shares to the market.

When the decision is made to issue securities, a price must be established for the securities. In the case of shares, the price is determined through analysis of supply and demand, the company's book value, growth potential and market position. In the case of bonds, the price is determined by the yield they offer in relation to other similar securities in the market.

Once the price of the securities has been established, the offering is made through authorized financial intermediaries, such as brokerage houses or stockbrokers. These intermediaries may purchase the securities directly from the company or government, or from other investors who already hold them.

When the securities have been issued, they can be traded in the secondary market. The secondary market is where securities are traded after the initial issuance. In this market, investors buy and sell the securities issued in the primary market.

The secondary market is an auction market, which means that the price of securities is determined by supply and demand. Buyers and sellers submit buy and sell orders through their financial intermediaries. These orders specify the price at which the buyer or seller is willing to buy or sell a certain amount of securities.

The orders are received by the stock exchange, which processes and combines them according to price and quantity. The price that is established as a result of this process is the equilibrium price, i.e. the price at which the transaction will take place.

When a company decides to go public, i.e., to issue and place its shares on the primary market, it must follow a series of phases explained below:

Planning and preparation: The company will conduct a thorough planning of the IPO process and prepare all the necessary documentation, such as the prospectus, audited financial and accounting reports and the business plan. In addition, it must select investment banks and legal and financial advisors to assist in the process.

Valuation of the company: to determine the issue price of the shares, the company must carry out a valuation of the business, taking into account aspects such as financial situation, profitability, market position and growth prospects. This valuation is essential to establish the share price and to attract investors.

Registration and approval: Once the company has prepared all the necessary documentation and has determined the share price, it must register the public offering with the relevant regulatory authorities, such as the Comisión Nacional del Mercado de Valores (CNMV) in Spain or the U.S. Securities and Exchange Commission (SEC) in the United States. Subsequently, the offer must be approved by these authorities in order to be carried out.

Roadshow: before the shares are issued, the company and the investment banks hold a roadshow to present the business to investors and convince them to invest in its shares. During the roadshow, presentations and meetings are held with institutional and individual investors, both nationally and internationally.

Placement of the shares: once the roadshow is completed and the IPO is approved, the company issues and places its shares in the primary market. In this process, investment banks act as underwriters, i.e. they buy the company's shares and sell them to investors. The placement of the shares can be done through a public offering, a private placement, or a combination of both.

Commencement of trading: once the shares have been placed with investors, trading of the shares on the secondary securities market begins. At this point, investors can buy and sell the shares freely in the stock market.

As can be seen, investment banks and financial advisors play a fundamental role in the process, assisting the company in the valuation, registration, and placement of the shares, as well as in the presentation and promotion of the company to investors. Therefore, these institutions have a very representative weight when it comes to valuing and acting in the markets.

1.2. ADVANTAGES AND DISADVANTAGES OF FINANCIAL MARKETS

Advantages of financial markets:

They provide liquidity: Financial markets provide a platform for buying and selling financial assets, allowing investors to convert their assets into cash quickly. This liquidity is essential for companies and individual investors who may need cash to finance short-term expenses.

They facilitate the efficient allocation of resources: Financial markets help allocate resources efficiently by pricing financial assets. Financial asset prices reflect investors' expectations of future returns, which helps economic agents make informed investment decisions.

Promote investment: Financial markets provide investors with a wide range of investment options, allowing them to diversify portfolios and reduce the risk of loss. Financial markets also promote investment by providing financing to companies seeking to fund their investment projects.

Disadvantages of financial markets:

Volatility: Financial markets can be volatile and experience wild swings in the prices of financial assets. This can be detrimental to investors and the economy in general if financial crises occur.

Speculation: Financial markets can also be prone to speculation, where investors buy and sell financial assets for short-term gains. Speculation can be detrimental to the economy by diverting resources away from productive investment and increasing volatility in financial markets.

Information asymmetry: Financial markets may be affected by information asymmetry in which some economic agents have access to privileged information that allows them to make more informed investment decisions than others. This can generate inequalities in financial markets and distort financial asset prices.

As we have seen, financial markets are an important part of the global economic system and have many advantages, but they also have disadvantages that must be taken into account. It is important that financial regulators work to minimize the disadvantages of financial markets while maintaining their advantages.

1.3. GLOBAL BENCHMARK STOCK INDEX

Stock indexes are a measure of the health of the stock market and reflect the performance of the stocks that make up that index. These indexes are made up of a group of stocks that are representative of the market and are used as a barometer of the economy and as a tool to evaluate the performance of companies. The main stock market indexes are:

Dow Jones Industrial Average (DJIA): one of the oldest and most widely followed stock market indexes in the world. The DJIA includes 30 major U.S. companies in a variety of sectors, such as technology, finance, and energy. It is used as a measure of the overall health of the U.S. economy.

S&P 500: The S&P 500 is one of the most important stock market indices in the United States and tracks the performance of the 500 largest publicly traded companies in the United States. It is considered an indicator of the overall performance of the U.S. stock market.

NASDAQ Composite: The NASDAQ is a stock market index that tracks the performance of all companies listed on the NASDAQ Stock Market. These companies are primarily technology and life sciences companies, which makes the NASDAQ considered an indicator of the health of these industries.

FTSE 100: This is the largest stock market index in the United Kingdom and tracks the performance of the 100 largest companies listed on the London Stock Exchange. These companies are from various sectors such as finance, energy, and natural resources.

Nikkei 225: The Nikkei 225 is Japan's main stock market index and tracks the performance of the 225 largest companies listed on the Tokyo Stock Exchange. These companies are mainly in the technology, finance, and manufacturing sectors.

Each stock index has its own methodology for selecting the companies that make up the index and for calculating the value of the index. Investors use these indices as a tool to evaluate the performance of investment portfolios and to make informed investment decisions based on the performance of the stock market in general.

1.4. FINANCIAL MARKET REGULATORY ENTITIES

There are a large number of national and international entities dedicated to the regulation of financial markets, some examples of international organizations that ensure regulatory compliance in financial markets are:

International Monetary Fund (IMF): An international organization dedicated to promoting international monetary and financial cooperation, exchange rate stability, facilitating international trade, promoting employment and sustainable economic growth, and reducing poverty in the world.

Bank for International Settlements (BIS): An international organization whose purpose is to promote international monetary and financial cooperation and to serve as a bank for central banks. Its functions include promoting financial stability, supervising financial markets, and conducting research on economic and financial issues.

International Organization of Securities Commissions (IOSCO): An international organization that brings together securities regulators from different countries and aims to promote cooperation and information exchange among them, as well as to develop international standards and practices for the regulation of securities markets.

Basel Committee on Banking Supervision (BCBS): This is a body that brings together the banking supervisors of the world's main countries and aims to develop international standards for banking supervision and risk management.

Financial Stability Board (FSB): An international body whose objective is to promote financial stability at the global level, coordinating the supervision and regulation of financial markets and financial institutions at the international level.

Organization for Economic Co-operation and Development (OECD): An international organization whose objective is to promote policies that improve the economic and social well-being of people worldwide, including the regulation and supervision of financial markets.

It should be noted that there are other entities and agencies at the international level that also play an important role in the regulation and supervision of financial markets, depending on the scope and geographic region in which they are located.

Stock exchanges are entities that operate under the regulations and supervision of different regulatory entities according to country and geographic region. The following are some of the most important regulatory entities of stock exchanges at the national level around the world:

Securities and Exchange Commission (SEC): the regulator of securities markets in the United States, including the most important stock exchanges in the country, such as the New York Stock Exchange and the Nasdaq Stock Market.

European Securities and Markets Authority (ESMA): A European regulator that oversees the securities markets in the European Union, including the stock exchanges of member countries such as the London Stock Exchange and the Frankfurt Stock Exchange.

Financial Conduct Authority (FCA): A UK regulator that oversees financial markets, including the London Stock Exchange.

Comisión Nacional Bancaria y de Valores (CNBV): A Mexican regulatory entity that oversees the securities markets in Mexico, including the Mexican Stock Exchange.

Comisión Nacional del Mercado de Valores de España (CNMV): A Spanish regulatory entity that oversees the securities markets in Spain, including the Madrid Stock Exchange.

Comisión del Mercado de Valores de Colombia (CMV): A Colombian regulatory entity that oversees the securities markets in Colombia, including the Colombian Stock Exchange.

2. LINKING MACRO-LEVEL ECONOMICS WITH FINANCE

The relationship between macroeconomic variables and financial markets has evolved throughout its history. In general, it can be said that there is a direct relationship between macroeconomic conditions and financial markets, as investors tend to make decisions based on expectations of economic growth, inflation, fiscal and monetary policies, among other macroeconomic variables.

In the first half of the 20th century, financial markets were underdeveloped and investment decisions were based more on political and social factors than on economic factors. Over time, however, financial markets became more sophisticated and consolidated, and investment decisions were increasingly based on the evaluation of macroeconomic data.

In the 1970s, the relationship between macroeconomic variables and financial markets intensified due to increased volatility in the markets and the growing complexity of the global economy. Investors began to use statistical and econometric models to analyze the relationship between macroeconomic indicators and financial asset prices.

In recent decades, the relationship between macroeconomic variables and financial markets has been very close, largely due to the globalization of markets and the increasing interconnectedness of economies around the world. The evolution of financial markets and financial innovation have enabled the creation of new investment instruments that have become essential tools for risk management and profit making.

The relationship between macroeconomic variables and financial markets has evolved throughout history, but it has always been a close and direct relationship. Investors and fund managers have used macroeconomic information to make investment decisions and manage portfolios efficiently.

3. HISTORICAL LINKAGE OF MACROECONOMIC VARIABLES AND FINANCIAL MARKETS

Financial markets have evolved significantly throughout history and their development has been influenced by various economic, political, and technological factors.

The origins of financial markets date back to ancient times when merchants and moneylenders began to exchange goods and services. In the Middle Ages, trade fairs emerged, where merchants could exchange goods and services more easily and quickly.

During the 17th and 18th centuries, modern stock exchanges, such as the Amsterdam Stock Exchange and the London Stock Exchange, were created. These exchanges allowed investors to buy and sell shares and subscriptions of companies and government institutions.

In the 19th century, futures and options markets were created, which allowed investors to buy and sell contracts that gave them the right to buy or sell an asset at a certain price in the future.

In the 20th century, foreign exchange markets were developed, which allowed investors to exchange currencies of different countries. In addition, commodity markets emerged, allowing investors to buy and sell commodities such as gold, oil, and wheat.

Beginning in the 1970s, financial markets underwent a major transformation with the advent of information technology and globalization. Advances in communications and computing enabled investors to trade instantly and cheaply from anywhere in the world.

The 1980s saw financial liberalization, which removed barriers to foreign investment and allowed for greater integration of international financial markets. Beginning in the 1990s, there was a boom in financial markets, driven by the expansion of the global economy and increased international trade. This boom manifested itself in the increased sophistication of financial products, such as financial derivatives and investment funds.

Throughout the 21st century, financial markets have continued to evolve, with the emergence of new technologies such as artificial intelligence and blockchain technology. These technologies have the potential to transform the way financial transactions are conducted and create new investment opportunities.

4. HISTORICAL EVOLUTION AND EXPLANATION OF THE OECD

The Organization for Economic Co-operation and Development (OECD) is an international organization of 38 member countries that promotes policies to improve the economic and social well-being of people around the world.

The OECD was established in 1961 as a continuation of the Organization for European Economic Cooperation (OEEC), created in 1948 to coordinate U.S. economic aid to Europe after World War II. The OEEC focused on economic reconstruction and cooperation among European countries, but as the world economy globalized, the need for a broader, more comprehensive organization encompassing countries around the world was recognized.

Since its inception, the OECD has worked to promote policies that foster economic growth and financial stability. In particular, it has promoted trade and investment liberalization and developed standards and guidelines for the regulation and supervision of financial markets.

The OECD has also been an advocate of sustainable development and has worked to promote policies that balance economic growth with environmental protection and social inclusion.

In terms of its link to financial markets, the OECD has been active in working to improve the regulation and supervision of financial markets and to promote financial stability. In particular, it has developed guidelines and standards for financial risk management, transparency in financial markets and the prevention of tax evasion.

In addition, the OECD has undertaken a number of initiatives aimed at improving cooperation and coordination among financial regulators and supervisors in different countries, including the creation of international working groups and forums to address specific issues related to financial markets.

III. PRACTICAL FRAMEWORK - METHODOLOGY

1. EXPLANATION OF THE DATA ANALYZED

For the preparation of this work, different types of data have been used to obtain the results necessary for the study and drawing of conclusions about the project.

Data were obtained from the stock market indexes of three different continents. As far as Europe is concerned, we have extracted data from the DAX 30 index, representing Germany; BEL 20, from Belgium; CAC 40, from France, AEX 25 from the Netherlands; and IBE 35, representing Spain. In America, we have used data from the USA with the S&P 500 index, and also from Mexico with IPC MEXICO. In Asia, we have obtained data from Japan with the NIKKEI 225. We have also found it appropriate to obtain data for the study of two countries with emerging economies that are not among the OECD countries, Brazil, and China. Brazil is of vital importance in drawing conclusions because it represents to a large extent the countries of South America that are not shaped by the economy of the United States of America, with totally different economic, political, and social structures. On the other hand, the choice of China, a country that is outside the OECD but currently has one of the most important emerging economies in the world can be of great help to, from an econometric point of view, give good data for the extraction of conclusions by the work.

Initially we had considered using other OECD countries, such as Italy, Switzerland, Luxembourg, Greece, United Kingdom... but we have decided not to include them in the project due to the limited availability of specific data on the markets of each of the countries mentioned.

The financial data have been obtained through *Bolsamanía*[1], *Data Hub*[2], *Bolsa y Mercados*[3], *London Stock Exchange*[4]. Portals and websites dedicated to the publication of financial data of the main world indexes, and which have a great reputation in the financial sector.

The macroeconomic data used for the preparation of the paper were obtained from the OECD's own website, more specifically from OECD Statistics. This page is a very broad database dedicated to all sectors, not only the economic one, but also collects data on

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[1] Bolsamanía - https://www.bolsamania.com/accion/INDICES-BURSATILES/historico-precios
[2] Data Hub - https://datahub.io/collections/stock-market-data
[3] Bolsa y mercados - https://www.bolsasymercados.es/esp/Estudios-Publicaciones/Estadisticas
[4] London Stock Exchange - https://www.londonstockexchange.com/securities-trading/market-data

demographic and social aspects... It allows you to customize a lot the main characteristics of the data, as well as the time intervals, axes...

These data follow time periods starting on January 1, 1995, and ending on December 31, 2021. We have decided to use this time interval for several reasons, firstly, because we were limited by the availability of data since we did not have all the data, both financial and macroeconomic, for the years prior to 1995. We believe that it may be important to use data covering these 26 years, since it is a period of time in which many things have happened, such as the enlargement of the European Union, the Asian Financial Crisis of 1997, the Global Financial Crisis of 2008, the OECD enlargement, the sovereign debt crisis in Europe, the COVID-19 pandemic....

About the provision of data, it has been decided to provide the data in annual values, as this allows us to carry out a broader monitoring of the different countries and to see the values, both financial markets and of the macroeconomic variables, from a more global perspective. All the data obtained have been downloaded in annual format, so there has not been any type of temporal alteration.

2. EXPLANATION OF THE MARKETS STUDIED AND THEIR MAIN CHARACTERISTICS

The choice of the stock market indexes used in this project comes from different starting points. Firstly, it was decided to choose the main financially important countries that make up the OECD. Once the choice of countries had been made, a search was made of the data available and the feasibility of each of the indexes was analyzed for the econometric studies planned to be carried out. As said, given the limited availability of data, it is decided that the countries studied will be Belgium, France, Germany, the Netherlands, Spain, the United States, Mexico, and Japan. About countries outside the OECD, it was decided to use data from Brazil and China to compare the results and represent their respective regions.

The graphs of the OECD countries studied in the time interval covered by the project, starting in 1995 and ending in 2021, can be found in the annexes.

A brief description of the importance of each of the indexes analyzed and the relevance of their countries is introduced below.

2.1. GERMAN STOCK EXCHANGE:

The German stock exchange, known as Deutsche Börse, is one of the most important stock exchanges in the world and plays a crucial role in the global economy. There are several reasons why the German stock exchange is important, firstly, because it is a strong economy. Germany is the largest economy in the European Union and one of the largest in the world. Germany's stock market is a reflection of the country's economic health and provides a platform for German companies to raise finance and grow.

Secondly, for its leading companies. Germany is known to be home to many world-leading companies in various sectors, such as automotive, engineering, technology, and chemicals. Companies such as Volkswagen Group, Siemens, Deutsche Bank or BMW, among others, are listed on the German stock exchange, which makes it an important center for investors who want to invest in these companies. There is great access to international investors. The German stock exchange attracts investors from all over the world looking for investment opportunities in Europe. It provides access to a wide range of financial instruments, such as stocks, bonds, derivatives, and mutual funds, facilitating portfolio diversification and risk management for international investors.

It is also a benchmark country for Europe. The German stock exchange also plays an important role as a benchmark for other stock exchanges in Europe. The DAX index, which represents the top 30 listed German companies, is widely followed, and used as a key indicator for assessing European market performance.

Financial innovation is a very important factor in the German business fabric. The German stock exchange has been a driver of innovation at the financial level. It has introduced new financial products and services, such as certificates of deposit, exchange-traded funds (ETFs) and electronic trading platforms, which has improved market efficiency and liquidity.

2.2. BELGIAN STOCK EXCHANGE:

The Belgium stock exchange, known as Euronext Brussels, plays a significant role in the country's economy and in the European financial landscape. Here are a few reasons why the Belgium stock exchange is important, firstly for being a financial center as Belgium is an important financial center in Europe, with a diversified economy and a strategic location. The Belgian stock exchange provides a platform for Belgian companies to obtain financing, expand and promote the country's economic growth.

In addition, Belgium is home to many multinational companies and leaders in various sectors such as pharmaceuticals, food industry, technology, and logistics. Companies such as Argenx, Elia Group or Sofina, among others, are listed on the Belgian stock exchange, which attracts investors and helps promote investment and business development in the country.

Through the Belgian markets, there is great access to international investors as the Belgian stock exchange provides access to international investors seeking investment opportunities in Europe. Through Euronext Brussels, investors can access a wide range of financial instruments, such as stocks, bonds, exchange-traded funds (ETFs) and derivatives, facilitating portfolio diversification and risk management.

The Belgian derivatives market is very important. The Belgian stock exchange has a well-developed and liquid derivatives market. Investors can trade derivatives products such as options and futures, providing opportunities for hedging and speculation in the financial markets.

Like Germany, Belgium is also a financial reference country for Europe. The Belgian stock exchange is part of Euronext, a pan-European group of stock exchanges that includes Amsterdam, Paris, and Lisbon. As such, the Belgian stock exchange is an important reference for the European financial market and contributes to the integration and liquidity of capital markets in Europe.

2.3. FRENCH STOCK EXCHANGE:

The French stock exchange, known as Euronext Paris, is one of the most important stock exchanges in Europe and plays a key role in the French economy and the global financial landscape. Some reasons why the French stock exchange is important may be because it is an economy with leading companies. France is one of the largest economies in Europe and has leading companies in various sectors such as automotive, energy, luxury, food, and aerospace. Companies such as Renault, Carrefour, Airbus Group and Michelin, among others, are listed on the French stock exchange, making it an important center for investors interested in the French market and investment opportunities in French companies.

Linked to the previous point is the characteristic that it has great access to international investors. The French stock exchange provides access to a broad base of international investors seeking opportunities in the European market. Through Euronext Paris, investors can access a wide range of financial instruments, such as stocks, bonds, exchange-traded funds (ETFs) and derivatives, facilitating portfolio diversification and risk management.

In financial innovation and technology, France is a pioneering center in Europe. The French stock exchange has been a driver of innovation at the financial level, with the introduction of new financial products, such as structured products, and the promotion of fintech and blockchain initiatives.

Finding itself within the Euronext group, it is a financial reference country in Europe. The French stock exchange is a key reference for the European financial market and the CAC 40 index, representing the 40 largest companies listed on Euronext Paris, is widely followed, and used as an indicator of European market performance.

French corporate finance makes the French financial markets a good choice when seeking capital. The French stock exchange plays a key role in corporate finance by providing a platform for French companies to raise capital and financing through equity and bond issues. This promotes investment, expansion, and economic growth in the country.

2.4. STOCK EXCHANGE NETHERLANDS:

The Netherlands stock exchange, known as Euronext Amsterdam, plays a significant role in the country's economy and in the European financial landscape. Here are a few reasons why the Netherlands stock exchange is important. Firstly, because it is one of the first stock exchanges in history and has a stable and diversified economy. The Netherlands has a stable and diversified economy, with a strong industrial base and a well-developed financial sector. The Dutch stock exchange reflects the economic health of the country and provides a platform for Dutch companies to raise finance and grow.

It also has a large number of multinational and leading companies. The Netherlands is home to many multinational companies and leaders in various sectors, such as the technology industry, agriculture, energy, and logistics. Companies such as ASML, Heineken, ING Groep or Philips, among others, are listed on the Dutch stock exchange, which attracts investors and promotes investment and business development in the country.

The Netherlands is known as a center of financial and technological innovation. The Netherlands Stock Exchange has pioneered the development of innovative financial products and services, such as sustainable investment products and electronic trading platforms, improving market efficiency and transparency.

The Dutch stock exchange is an important benchmark for the European financial market and the AEX index, which represents the top 25 companies listed on Euronext Amsterdam, is widely followed, and used as an indicator of European market performance.

2.5. SPANISH STOCK EXCHANGE:

Spain's stock exchange, known as Bolsas y Mercados Españoles (BME), plays a key role in the Spanish economy and in the European financial landscape. Below are some reasons why the Spanish stock exchange is important.

It is vitally important to include the Spanish stock exchange in this study, firstly, because it is one of the national financial markets closest to us and the one we hear most about on a daily basis. In addition, it has a leading economy and leading companies. Spain is one of the largest economies in Europe and has leading companies in various sectors, such as banking, telecommunications, energy, tourism, and construction. Companies such as Inditex, Iberdrola, Banco Santander and BBVA, among others, are listed on the Spanish stock exchange, making it an important center for investors looking to invest in the Spanish market and in investment opportunities in Spanish companies.

The Spanish stock exchange has an active and liquid bond market. This allows companies and the Spanish government to obtain financing through bond issuance and investors to access a wide range of debt instruments.

The Spanish stock exchange is a key benchmark for the European financial market and the IBEX 35 index, which represents the 35 largest companies listed on BME, is widely followed, and used as an indicator of Spanish and European market performance.

In Spain there is a strong encouragement of business growth. Spain's stock exchange encourages business growth by providing a platform for companies to raise finance through share and bond issues. This promotes investment, job creation and economic development in the country.

2.6. U.S. STOCK EXCHANGE:

The U.S. stock market, particularly the New York Stock Exchange (NYSE) and NASDAQ, is very important both domestically and globally. It is currently considered the largest economy in the world. The United States has the largest economy in the world. The stock market reflects the performance and health of this economy and provides a key reference point for investors and companies around the world.

The United States has a network of leading and innovative companies. The U.S. stock market is home to many leading and innovative companies in a variety of sectors, such as technology, finance, healthcare, retail and more. Companies such as Apple, Microsoft,

Alphabet, Amazon, Meta, Tesla, and others are listed on the U.S. Stock Exchange. These companies attract investors and offer investment opportunities in companies with high growth and return potential.

The U.S. stock exchange is a crucial channel for companies to raise capital through equity issues. Companies can raise funds in the equity markets to finance expansion, research and development, acquisitions, and other strategic projects.

The U.S. equity markets are highly liquid and transparent, which means that there are a large number of willing buyers and sellers, and that relevant information is widely available. This gives investors' confidence and facilitates the efficient buying and selling of securities. The U.S. stock exchange is considered a global standard in terms of regulation, transparency, and corporate governance. Companies listed on the U.S. markets are subject to strict financial reporting and disclosure requirements, providing greater investor protection and promoting confidence in the securities markets.

The U.S. stock market has a major influence on international financial markets. Movements in U.S. benchmark indexes, such as the S&P 500 and the Dow Jones Industrial Average, often have a significant impact on global markets and investment decisions in other countries.

2.7. MEXICO STOCK EXCHANGE:

Mexico's stock exchange, known as the Bolsa Mexicana de Valores (BMV), plays a key role in the country's economy and in the Latin American financial landscape. Mexico is one of the largest economies in Latin America and has experienced steady economic growth in recent decades. The Mexican stock exchange reflects the health of the Mexican economy and provides a key reference point for domestic and international investors.

The Mexican stock exchange is an important financing channel for Mexican companies. It allows companies to raise capital through stock and bond issues, giving them the opportunity to finance their growth, expansion, and strategic projects.

The BMV is home to leading companies in various sectors, such as telecommunications, banking, manufacturing, energy, and consumer goods. Companies such as Walmex, AMX, GMexico and FEMSA, among others, are listed on the Mexican Stock Exchange. These companies represent a significant part of the Mexican economy and provide investment opportunities for market participants.

The Mexican stock exchange plays an important role in promoting savings and investment in the country. It allows individuals and institutions to invest in shares and other financial instruments and help channel savings toward economic growth and business development.

The BMV is a benchmark for Latin America's financial markets. Its size and liquidity attract investors and promote the integration of the region's capital markets. In addition, the BMV has a collaborative relationship with other Latin American stock exchanges, facilitating interconnection and cross-border investment.

Mexico's stock exchange has developed a robust and liquid derivatives market that includes futures and options on stocks, indices, and currencies. This provides tools for hedging and speculation, as well as offering additional investment opportunities.

2.8. JAPAN STOCK EXCHANGE:

Japan's stock exchange, known as the Tokyo Stock Exchange, plays a key role in the Japanese economy and the global financial landscape. Japan is the third largest economy in the world, after the United States and China. The Japanese stock exchange reflects the performance and health of this economy and serves as a key reference point for investors and companies interested in the Japanese market.

Japan's stock exchange is home to some of the world's largest and best-known companies in sectors such as technology, automotive, electronics, healthcare, and finance. Companies such as Toyota, Sony, Panasonic, Nintendo, and Honda are listed on the Tokyo Stock Exchange, making it an important hub for investors seeking investment opportunities in leading and innovative Japanese companies.

The Japanese stock exchange offers access to a broad base of global investors. Japan is known for having a large participation of institutional and retail investors, as well as foreign investors.

Japan's stock exchange has a liquid and transparent capital market, which facilitates the efficient buying and selling of securities. In addition, Japan has strict disclosure and corporate governance standards, which provides confidence to investors and promotes transparency in the financial markets.

Japan has been a leader in the adoption of financial technologies and has fostered innovation in the sector. The Japan Stock Exchange has introduced measures to facilitate

electronic trading, promote market access for retail investors and improve efficiency in trade settlement.

The Japan Stock Exchange provides investors with the opportunity to diversify portfolios by including Japanese companies in the investment mix. This helps reduce risk and increase return opportunities by having exposure to a different economy and market.

As for countries outside the OECD, we can find two, Brazil representing South America and China representing Asia and the world's second largest economy.

2.9. BRAZILIAN STOCK EXCHANGE:

The Brazilian stock exchange, known as B3 (Bolsa, Brasil, Balcão), plays a crucial role in the Brazilian economy and is one of the most important stock exchanges in Latin America. Brazil has the largest economy in Latin America and the Brazilian stock exchange reflects the health and performance of this economy. It is a key reference point for investors and companies interested in the Brazilian market.

B3 hosts leading companies in various sectors, such as banking, energy, mining, agriculture, and industry. Companies such as Petrobras, Banco do Brasil, JBS and Eletrobrás, among others, are listed on the Brazilian Stock Exchange. These companies represent a significant part of the Brazilian economy and offer investment opportunities to market participants.

The Brazilian Stock Exchange has a developed and liquid capital market. It offers a wide range of financial instruments, including stocks, bonds, mutual funds, and derivatives. This facilitates portfolio diversification and risk management for investors.

Brazil's stock exchange plays an important role in encouraging savings and investment in the country. It allows individuals and institutions to invest in the stock market, which channels savings into productive investments and contributes to long-term economic growth. B3 is considered a regional benchmark in Latin America. The size, liquidity and diversity of listed companies attract investors from the region and promote the integration of Latin American capital markets.

Brazil is a major producer and exporter of commodities such as oil, iron ore, soybeans, and coffee. Brazil's stock exchange offers a market for trading futures and options contracts on these commodities, allowing investors and companies to hedge risks and take advantage of opportunities in these markets.

2.10. CHINA STOCK EXCHANGE:

China's stock market plays a key role in the country's economy and in the global financial landscape. China is the second largest economy in the world, second only to the United States. China's stock exchange reflects the performance and health of this fast-growing economy and has become a key reference point for investors and companies interested in the Chinese market.

The China Stock Exchange offers domestic and international investors the opportunity to invest in some of the country's largest and fastest growing companies. China is home to leading companies in sectors such as technology, manufacturing, energy, banking, and retail. Companies such as ICBC, TikTok, China Construction Bank, State Grid and others are listed on the China Stock Exchange. Investing in these companies can offer attractive return opportunities and portfolio diversification.

China's stock market has experienced significant growth in recent years and has broadened its scope. The gradual opening of the market to foreign investors through the stock connect programs (Shanghai-Hong Kong Stock Connect and Shenzhen-Hong Kong Stock Connect) has enabled greater foreign participation in Chinese stock exchanges.

Given China's economic importance, movements on Chinese stock exchanges can have a significant impact on global financial markets. Investors and market players pay attention to fluctuations and trends in Chinese stock exchanges as an indication of China's economic health and its impact on the global economy.

China has become a leader in technological innovation, particularly in areas such as artificial intelligence, e-commerce, and payment technology. Many of the leading companies in these areas are listed on China's stock exchange, giving investors the opportunity to participate in the growth and evolution of these industries.

China's stock exchange provides an avenue for Chinese companies to raise capital to fund their growth and expansion. The issuance of stocks and bonds on the Chinese stock exchanges allows Chinese companies to access the capital markets and raise funds for strategic investments and business projects.

3. INTERVIEWS WITH EXPERTS:

Taking advantage of the contacts available in the financial sector, it has been decided to conduct interviews with experts in the financial markets to know first-hand, what is their opinion on the subject addressed by this project. It was considered convenient to know the opinion of people who are professionally involved in finance and who, through their skills and experience, have a well-founded opinion.

The interviewees accepted the data protection policy by agreeing to answer the questionnaire, as they were informed with the following message:

"By agreeing to answer this questionnaire you accept that, according to the Organic Law 3/2018, of December 5, on Personal Data Protection and guarantee of digital rights, the answers will be treated for obtaining empirical results and may be included in the work previously described."

Among the people interviewed were investment analysts and portfolio managers from such well-known firms as Blackstone, Morgan Stanley, Goldman Sachs, among others.
It was decided to ask the same questions to all the interviewees in order to see the similarities and differences between each of the interviewees. The questions are detailed in the appendices of the paper.

The people interviewed responded affirmatively to the existence of influence between macroeconomic variables and financial markets and agreed in many cases that the variables that most affect them are economic growth and interest rates. Some of the interviewees also agreed that the best way to measure this impact is through econometric models and through the use of Machine Learning. The experts are very aware that even if a very good statistical model is created, it would not be possible to accurately measure all the effects given the multiple variables to be taken into account and many say, and I quote, *"the future is impossible to predict"*.

4. MARKET ANALYSIS

4.1. FUNDAMENTAL ANALYSIS OF FINANCIAL MARKETS IN OECD COUNTRIES BETWEEN 1995 AND 2021:

During the period from 1995 to 2021, financial markets in Organization for Economic Co-operation and Development (OECD) countries experienced a number of significant changes. From technological advances to economic crises, this period encompassed a wide range of events and developments that left their mark on OECD financial markets.

For most of the period under review, OECD countries experienced steady economic growth and expanding financial markets. Economic growth boosted investor confidence and increased demand for financial assets, resulting in higher prices for equities and other financial instruments. Gross domestic product (GDP) growth and improving macroeconomic indicators were key factors driving the expansion of financial markets.

One of the most significant events that took place in OECD financial markets during this period was the dot-com bubble. In the late 1990s, there was a speculative boom in the shares of technology companies, especially in the Internet sector. Investors were willing to pay exorbitant prices for shares of companies with little or no real profit. However, in 2000, the bubble burst and many technology companies collapsed, resulting in large losses for investors and a sharp drop in stock prices.

During the period under review, OECD financial markets were also affected by several significant economic crises and recessions. The Asian financial crisis of 1997, the global financial crisis of 2008-2009 and the sovereign debt crisis in Europe from 2010 onwards had a negative impact on financial markets and resulted in drastic falls in stock prices. These crises revealed the interconnectedness and vulnerability of global financial markets and generated volatility and uncertainty in OECD markets.

Monetary policies and economic stimuli implemented by central banks and governments also played an important role in OECD financial markets. During the global financial crisis, central banks adopted extraordinary measures such as interest rate cuts and quantitative easing programs to stimulate the economy and stabilize financial markets. These policies had a significant impact on financial asset prices and helped drive the recovery of markets after the crises.

During this period, technological advances had a transformative impact on OECD financial markets. The widespread adoption of the Internet and the digitization of financial operations changed the way transactions were conducted and gave retail investors access to

financial markets. The emergence of new technology companies and the disruption of traditional business models also influenced financial markets and created unique investment opportunities.

4.2. TECHNICAL ANALYSIS OF FINANCIAL MARKETS WITH MACROECONOMIC VARIABLES:

In order to graphically see the relationship between the macroeconomic variables and the financial markets and not to extend its duration, it has been decided to choose three countries to represent the graphic relationship of each of the continents within the OECD.

As far as Europe is concerned, Germany has been chosen, as a model of a strong economy and one of the most important on a continental level. On the other hand, the representative country of America has been chosen as the United States of America, as it is considered the country with the number 1 economy in the world and the one with the most weight in the markets. Finally, representing Asia we find Japan, a pioneering country with a very strong industry as well.

Europe – Germany:
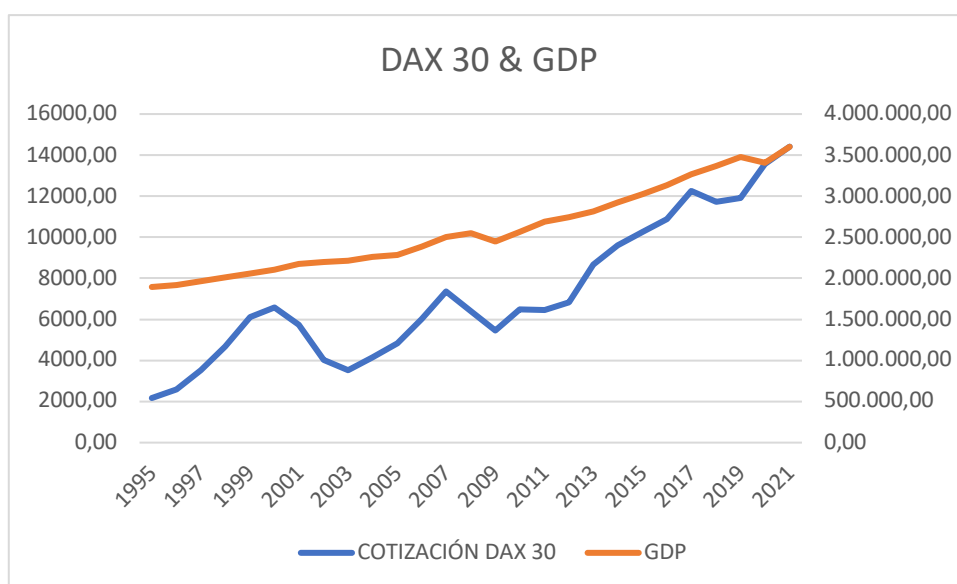
Figure 4.2.1 - DAX 30 & GDP
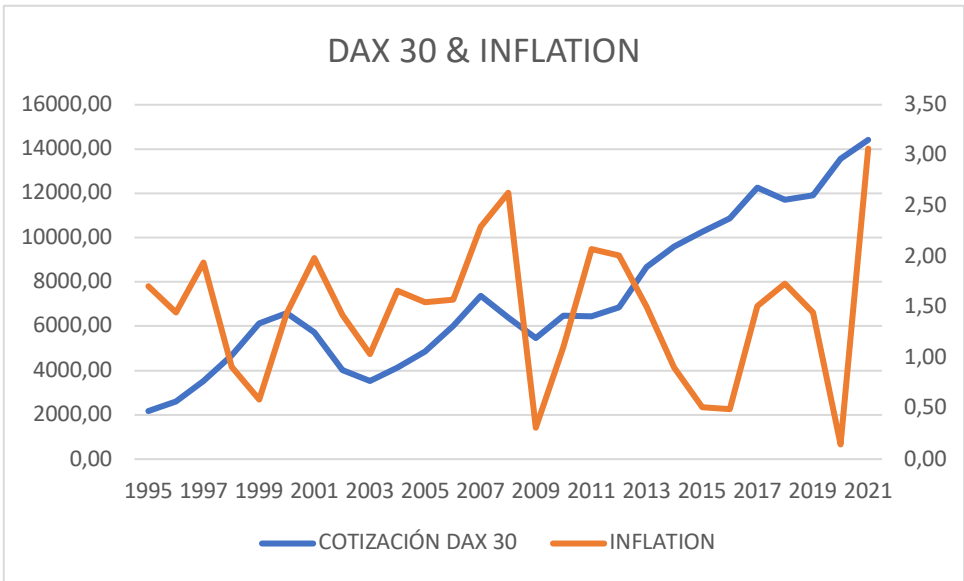
Figure 4.2.2 - DAX 30 & INFLATION
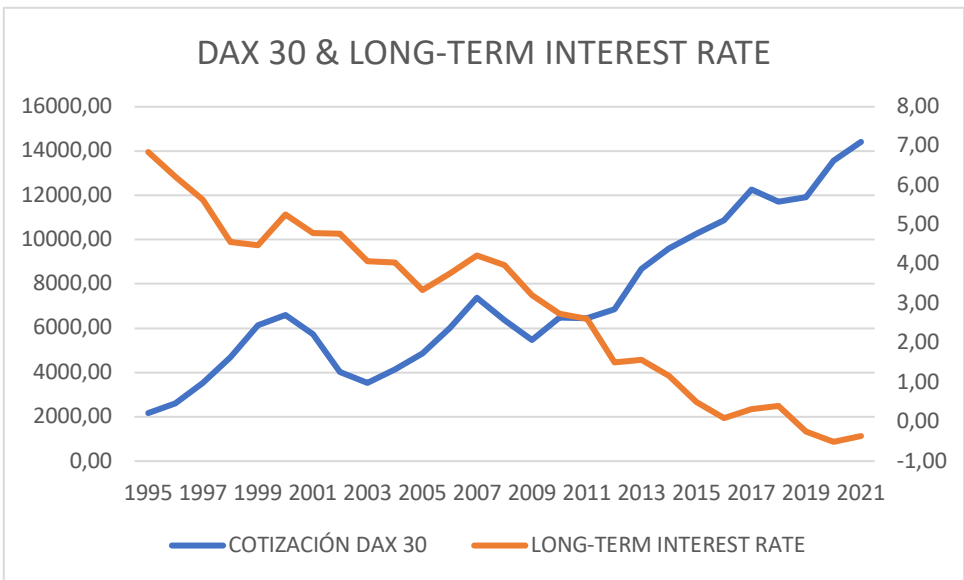
Figure 4.2.3 - DAX 30 & LONG TERM INTEREST RATE

In this case we can see a very direct follow-up regarding the relationship between the DAX30 quotations and the German GDP. We cannot say the same about the relationship between the DAX30 quotations and German inflation since inflation fluctuates unevenly and with little relation to the studied variable. The relationship between the DAX30 quotations and the Long-Term Interest Rate is inverse since both variables have completely different trends.

31

America – United States:
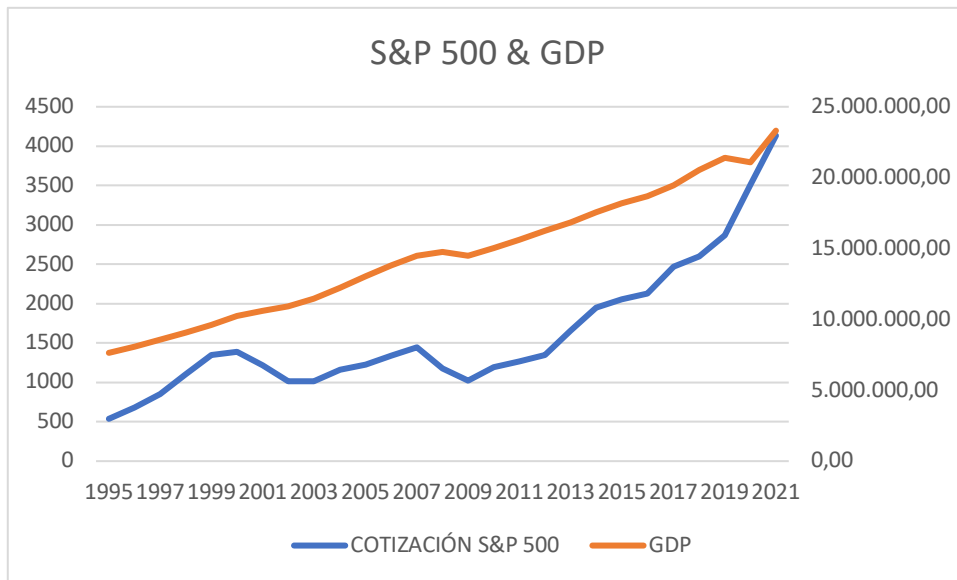
Figure 4.2.4 - S&P 500 & GDP
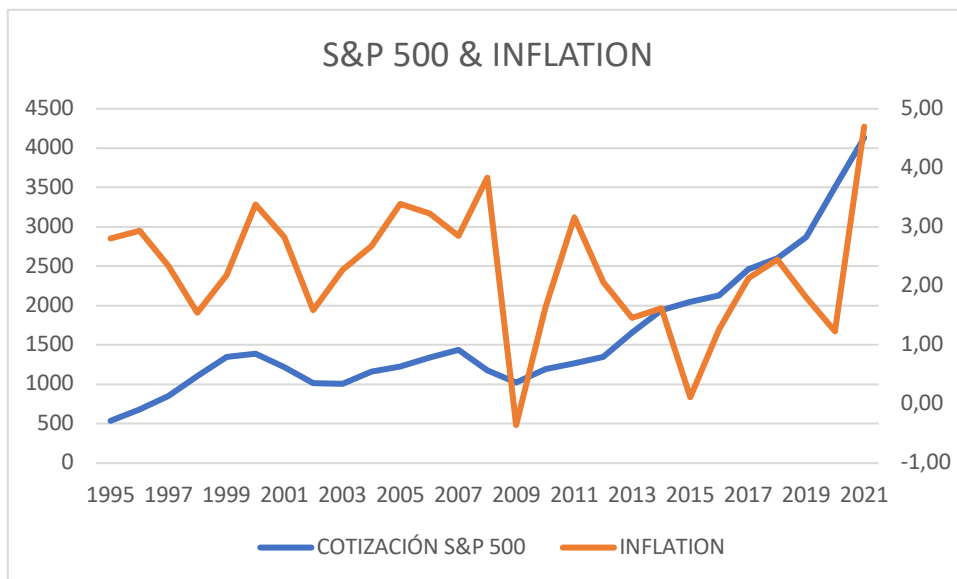
Figure 4.2.5 - S&P 500 & INFLATION
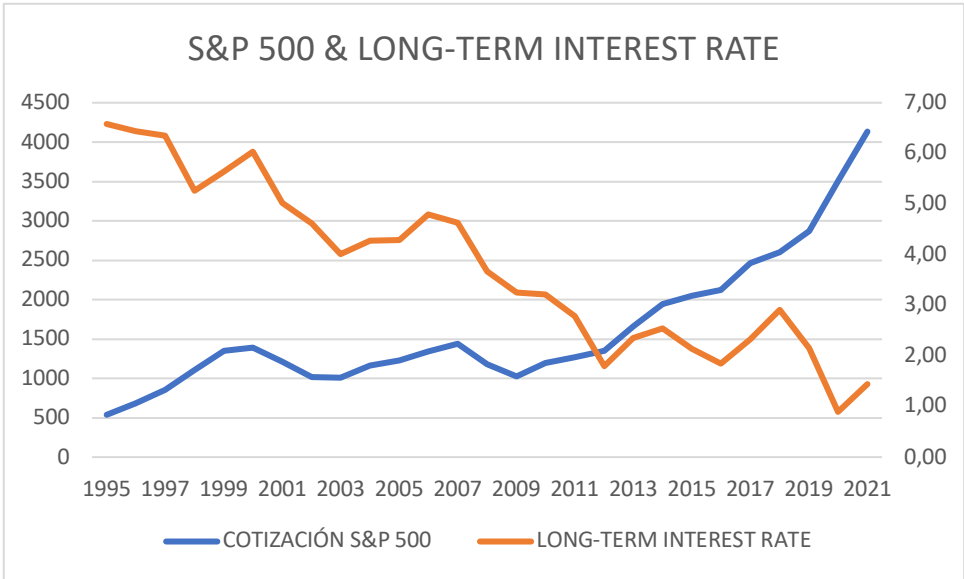
Figure 4.2.6 - S&P 500 & LONG TERM INTEREST RATE

In the case of the United States, we can see a very similar pattern to the one analyzed with Germany, a very direct follow-up in terms of the relationship between the S&P 500 quotations and the American GDP. The same cannot be said for the relationship between the S&P 500 quotes and American inflation since inflation fluctuates unevenly and with little relation to the variable under study. The relationship between the quotes of the S&P 500 and the Long-Term Interest Rate is inverse since both variables have completely different trends.

Asia – Japan:
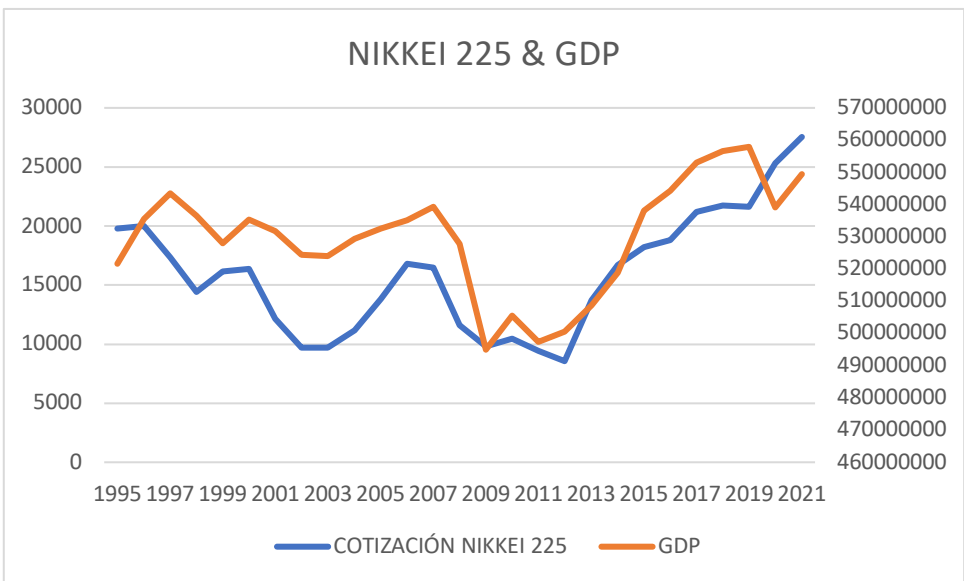
Figure 4.2.7 - NIKKEI 225 & GDP
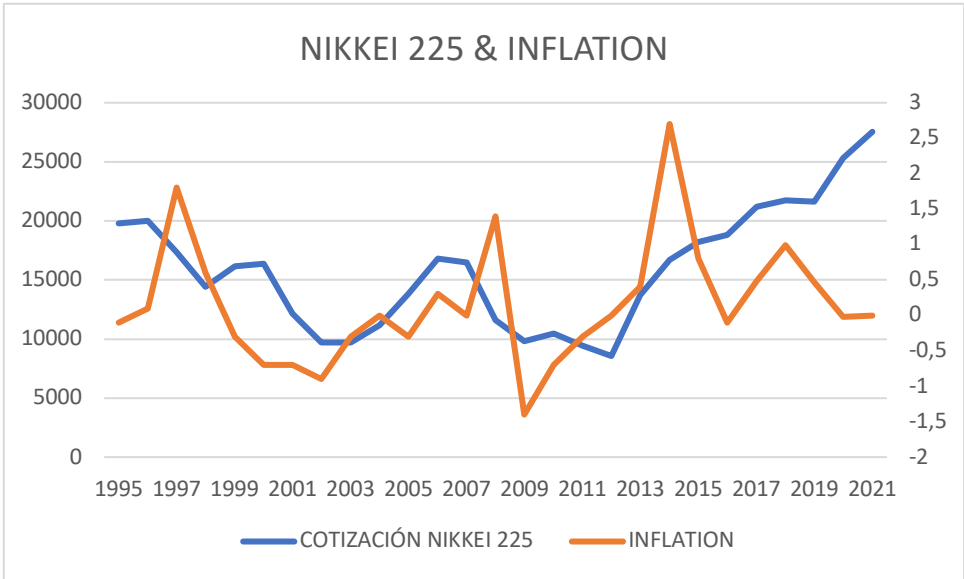
Figure 4.2.8 - NIKKEI 225 & INFLATION
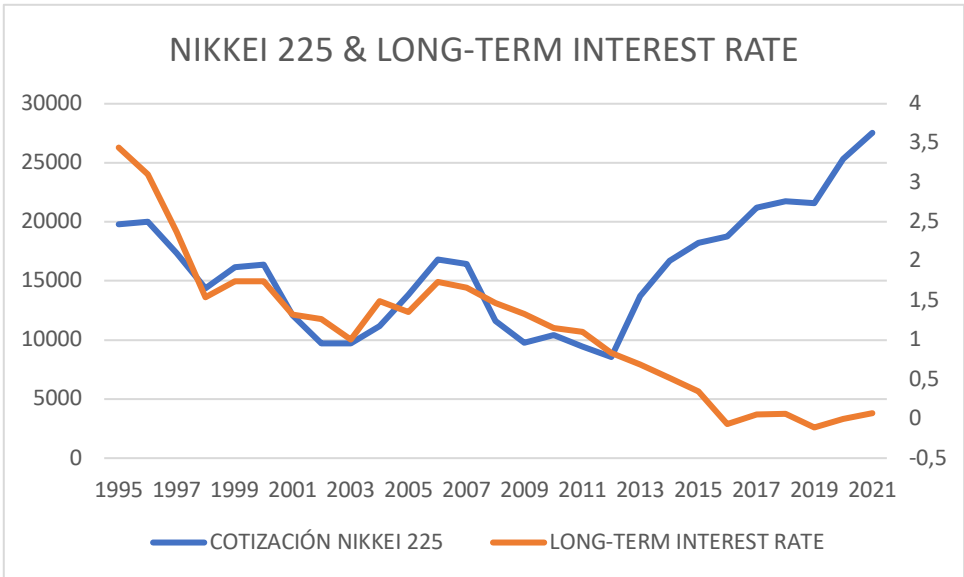
Figure 4.2.9 - NIKKEI 225 & LONG TERM INTEREST RATE

The case of Japan is totally different and does not follow the pattern shown by the other two analyzed countries. Japan shows very direct tracking in terms of the relationship between NIKKEI 225 quotes and Japanese GDP. Unlike the cases shown in Germany and the United States, in this case the quotes of the NIKKEI 225 have a direct relationship with Japanese inflation. The relationship between the quotations of the NIKKEI 225 and the Long-Term Interest Rate is largely direct on the graph, which is why it differs from the previous cases analyzed. From 2012, this relationship between NIKKEI 225 and the Long-Term Interest Rate becomes inverse and breaks with the pattern followed in previous years.

5. ECONOMETRIC STUDY:

5.1. PREVIOUS HYPOTHESIS - INFLUENCE BETWEEN MACROECONOMIC VARIABLES AND THE STOCK MARKET:

The relationship between macroeconomic variables and the stock market has been the subject of much interest and research in the field of economics and finance. Investors, analysts, and policy makers are constantly trying to understand how macroeconomic factors can affect stock prices and market trends.

Macroeconomic variables refer to large-scale economic indicators and measures that describe the overall health of an economy. Some of the most common macroeconomic variables include gross domestic product (GDP), inflation, interest rate, unemployment, exchange rate and fiscal policy. These variables capture different aspects of the economy, from economic growth to price stability and labor market conditions.

One of the ways in which macroeconomic variables can influence the stock market is through their impact on corporate earnings and prospects. For example, higher economic growth, as measured by rising GDP, is generally associated with higher corporate fiscal year and higher corporate earnings. This can increase investor confidence and generate greater demand for stocks, which in turn can raise stock prices.

Similarly, inflation and interest rates can also have an impact on the stock market. An increase in inflation can lead to higher production costs for companies, which can negatively affect their profit margins and reduce the value of stocks. In addition, higher interest rates can make investing in stocks less attractive compared to other investment alternatives, which could lead to a decrease in demand for stocks and a fall in prices.

Another way in which macroeconomic variables can influence the stock market is through capital flows and foreign investment. International investors often consider macroeconomic conditions in a country before making investment decisions. For example, restrictive fiscal policy or increased political instability may raise concerns about a country's economic stability and deter foreign investment. This could negatively affect the country's stock market.

In addition to these factors, macroeconomic variables can also influence the stock market through investor psychology and market expectations. For example, positive economic news, such as a favorable employment report or an announcement of favorable economic policies, can increase investor optimism and generate upward momentum in the stock market.

Conversely, negative news or economic uncertainty can generate volatility and declines in stock prices.

It is important to keep in mind that the relationship between macroeconomic variables and the stock market can be complex and subject to various additional influences and factors. For example, financial markets are also influenced by industry-specific factors, geopolitical events, government regulations, and changes in monetary and fiscal policies.

In addition, causal relationships between macroeconomic variables and the stock market can be bidirectional and subject to feedback. For example, while higher economic growth can boost the stock market, it is also possible that a rising stock market can stimulate consumer confidence and spending, which in turn can contribute to economic growth.

5.2. RELATIONSHIPS BETWEEN VARIABLES:

In order to determine whether there is an influence between macroeconomic variables and financial markets, and how this influence varies in relation to the countries studied, a multiple linear regression will be performed. This regression will allow us to determine whether there is a relationship between the variables analyzed and what type of relationship it is, i.e., whether it is direct or inverse.

This type of regression will also allow us to see if the data used and its results are significant, since a significance test will be performed, in which we will look at the p-value, if this is less than 0.05 (since we assume that it explains their relationship with a probability of 95%) we will understand that there is a significant relationship between the variables, since the null hypothesis must be rejected and, consequently, it is "statistically significant". The lower the p-value, the greater the evidence that the variables are related to each other.

$$STOCK\ PRICE_t = \beta_0 + \beta_1 GDP + \beta_2 Inflation + \beta_3 Long\ Term\ Interest\ Rate + \varepsilon_t$$

We have decided to divide the regressions by country in order to see the comparisons between them and draw conclusions.

	P-value (F)	Significance
GERMANY	1.59e-12 ***	Global significance
BELGIUM	0.002045 ***	Global significance
FRANCE	0.008740 ***	Global significance
NETHERLANDS	0.041502 **	Global significance
SPAIN	0.029756 **	Global significance
UNITED STATES OF AMERICA	1.53e-08 ***	Global significance
MEXICO	0.173163	No Global significance
JAPAN	0.000266 ***	Global significance
***BRAZIL**	1.19e-08 ***	Global significance
***CHINA**	0.104009	No Global significance

Table 1 - Level of Significance

We can see in the table above the overall significance between the macroeconomic variables and the financial markets of the OECD countries. This table is more detailed in the annexes of the paper, where all the regressions used can be seen.

For the countries Belgium, France, Germany, the Netherlands, Spain, the United States of America, Japan and Brazil, there is a significant relationship between the variables. In contrast, we have been able to see how, through the regressions performed, there is no overall significant relationship between the variables in the case of the countries of Mexico and China.

If we focus on the individual variables, we can see how the significance relationship varies depending on the variables, as shown in the table below.

	P-value (F)		
	GDP	**Inflation**	**Long-term Interest Rate**
GERMANY	1.09e-14 ***	0.813931	8.91e-12 ***
BELGIUM	0.001241 ***	0.861968	0.000183 ***
FRANCE	0.002016 ***	0.002473 ***	0.001447 ***
NETHERLANDS	0.042379 **	0.376020	0.027700 **
SPAIN	0.003035 ***	0.306016	0.011165 **
USA	1.60e-09 ***	0.853483	9.17e-06 ***
MEXICO	1.20e-13 ***	0.000837 ***	0.154658
JAPAN	6.33e-06 ***	0.072082 *	0.202561
***BRAZIL**	3.80e-10 ***	0.073841 *	0.000022 ***
***CHINA**	2.69e-08 ***	0.477741	0.979083

Table 2 - Level of Individual Significance

As can be seen in the table above, the macroeconomic variable that has the most significant relationship with financial market prices is Gross Domestic Product (GDP). As for inflation, it only has a significant relationship in two countries, France, and Mexico; in all other countries, there is no significant relationship at all, taking into account that alpha is equal to 0.05. If we consider the Long-term Interest Rate, we can see how in most countries (without considering Mexico, Japan, and China), there is a strong relationship of significance with the prices of financial markets.

IV. ANALYSIS OF THE RESULTS:

After data mining, we can perform an analysis of the results obtained to provide an explanation for the initial hypotheses of the paper and see the impact of macroeconomic variables on the financial markets of OECD countries.

Gross Domestic Product (GDP):

GDP and financial markets are interconnected in many ways, and the relationship between the two variables is very complex. From a macroeconomic perspective, GDP reflects the health and performance of an economy. Higher economic growth, as measured by an increase in GDP, is generally associated with better economic conditions, which can boost investor confidence and increase demand for financial assets. Therefore, prices of stocks and other financial instruments tend to rise in an environment of solid economic growth.

As can be seen through the regressions used in the data mining, this fact is fulfilled by looking at the significance relationship between the variables and the correlation between the variables.

GDP also influences corporate earnings of firms. In an environment of economic growth, companies tend to experience an increase in sales and profits, which can be reflected in higher profits. Companies with higher corporate earnings tend to be more attractive to investors, which can lead to an increase in their share price in the financial markets.

Economic growth and increased GDP can attract domestic and international capital flows. Investors seek investment opportunities in countries with strong economic growth, which may result in increased demand for local financial assets. These capital flows can have a significant impact on the price of financial markets, as supply and demand for financial assets determine their prices.

In addition, monetary and fiscal policies implemented by central banks and governments can also have an impact on the relationship between GDP and the price of financial markets. For example, an expansionary monetary policy, such as lowering interest rates or implementing quantitative easing measures, can stimulate economic growth and have a positive effect on financial markets. Similarly, an expansionary fiscal policy, such as increasing public spending or reducing taxes, can boost aggregate demand and benefit financial markets.

In addition to economic factors, GDP can also influence market sentiment and impact investor expectations. Upward or downward revisions to economic growth can have a significant impact on investors' perceptions of the health of the economy and thus on financial market prices. Expectations of stronger economic growth in the future can be an increase in financial asset prices, while concerns about an economic slowdown can generate a decrease in prices.

It is important to note that the relationship between GDP and financial market prices is neither linear nor deterministic. Other factors, such as geopolitical events, changes in international trade conditions, regulatory policies, and exchange rate fluctuations, can also influence financial markets. In addition, financial markets are inherently volatile and subject to the influence of multiple variables, making it difficult to accurately predict asset prices based on GDP alone.

In terms of cross-country comparison, relative to GDP all countries have a high significance relationship between GDP and stock prices of the respective countries. Therefore, we can extract results and say that the Gross Domestic Product has an impact on the financial markets of the countries analyzed. This direct relationship can be seen in the graphs attached to the annexes.

Inflation:

The relationship between inflation and interest rates is a key factor influencing the pricing of financial markets. When inflation is high, central banks often raise interest rates to control it. Higher interest rates can negatively affect financial markets by increasing the cost of credit and discouraging investment and consumption. This can lead to a decline in the price of financial assets, such as stocks and bonds.

At a theoretical level, we understand that inflation affects the real return on financial assets. When inflation is high, the real return on bonds and other debt instruments decreases, as the purchasing power of money is reduced. This may cause investors to seek more profitable investment alternatives, such as equities, which could increase demand and, consequently, stock prices.

Inflation expectations can have a significant impact on financial markets. If investors anticipate an increase in inflation in the future, they may adjust investment portfolios to protect against the erosion of purchasing power. This may result in increased demand for assets that have historically been viewed as hedges against inflation, such as real estate, commodities, or stocks of companies with the ability to adjust their prices in an inflationary environment. These expectations can influence the price of financial assets.

Inflation can affect the valuation of financial assets. In an inflationary environment, a company's future earnings and cash flows may be affected. This can have an impact on the valuation of companies and, consequently, on their share price in the financial markets. Investors may adjust their expectations and valuations based on the inflationary outlook, which can result in movements in financial asset prices.

However, the regressions conducted during this project have shown that only in two countries, such as Mexico and France, inflation is a factor that has a significant relationship with financial market prices. In the rest of the countries studied, there is no significant relationship between inflation and financial markets, which allows us to draw conclusions that inflation does not have a high significance relationship and therefore does not have sufficient impact on financial markets in many OECD countries.

Long-term Interest Rate:

The long-term interest rate affects the cost of credit for businesses and consumers. When the long-term interest rate is high, borrowing becomes more expensive, which can discourage investment and consumption. This can have a negative impact on businesses, especially those that rely on borrowing to finance operations or investment projects. A decrease in the demand for loans can lead to a decrease in the stock price of these companies.

The long-term interest rate also influences bond yields. Bonds are debt assets issued by governments or corporations and are subject to changes in interest rates. When the long-term interest rate rises, the yield on existing bonds tends to decline, which may cause investors to seek more attractive alternatives. This can lead to a sell-off of bonds in the market, which in turn can lead to a decrease in their price and a lower price in the financial markets.

The long-term interest rate is also used to discount a company's future cash flows. The present value of future cash flows is calculated using a discount rate, which is usually related to the long-term interest rate. If the long-term interest rate increases, the present value of future cash flows may decrease, which may affect the valuation of companies and, consequently, the price in the financial markets.

The long-term interest rate can also influence the economic outlook. An increase in the long-term interest rate may signal tighter monetary policy or signal higher inflation expectations. This can generate uncertainty in the markets and affect investor confidence. Negative economic prospects may result in lower financial asset prices.

The long-term interest rate also competes with other investment assets, such as equities. When the long-term interest rate is high, bonds and other fixed income assets may become more attractive compared to stocks, as they offer a relatively safe return. This can lead to a decrease in the demand for stocks and, consequently, to a decrease in the price in the financial markets.

It has been possible to verify how, in the regression performed, a strong significant relationship can be seen between the long-term interest rate and the stock prices of the main countries studied. Mexico, Japan, and China are the only countries studied that do not have a strong relationship of significance between the two variables used. After analyzing the data, it can be understood that there is a strong relationship of significance, so we understand that there is a high incidence of the long-term interest rate with the financial markets of the OECD countries. This inverse relationship can be seen in the graphs attached to the annexes.

V.   CONCLUSIONS

After having extracted results with the methodological analysis, macroeconomic variables seem to be a good indicator of the behavior of financial markets since in most of the cases analyzed, a significant relationship between the variables has been found. In other words, we can conclude that macroeconomic variables have an impact on financial markets in OECD countries.

As has been shown during the analysis, macroeconomic variables have a different level of impact on financial markets depending on the variable and the country. Some variables have a direct and others an inverse relationship with the financial markets, and some have a greater and others a lesser impact. Explaining the analyzed results, it is not possible to draw precise conclusions about the different incidences between countries that belong to the OECD and those that do not, given that there is no distinct pattern that allows us to see a difference between belonging or not to the OECD.

In addition to the econometric part of the work, there have also been other parts such as fundamental analysis or technical analysis, which have allowed us to see the relationship that the econometric regressions have shown. The expert interviews are also another example of how people who work professionally in the financial sector and who have a high level of knowledge of the sector, as a result of their skills and experience, have such a clear opinion that macroeconomic variables have a great impact on the financial markets.

Through historical evolution, it has been possible to verify how financial markets have been influenced by macroeconomic variables, and this has been shown in the project carried out. During the study, it has been examined how several macroeconomic variables, such as GDP, inflation, and the long-term interest rate can affect the price of financial assets and market dynamics. The main conclusions obtained are presented below.

There is a significant relationship between economic growth, measured through GDP, and the price of financial markets. Higher economic growth tends to generate positive expectations among investors, which can result in an increase in the prices of financial assets. However, it is important to consider that this relationship is not linear and is subject to the interaction of multiple factors.

Inflation plays an important role in the price of financial markets. Inflation levels can influence interest rates, bond yields, and investor expectations. In general, high inflation can negatively affect the price of financial assets, especially fixed income since it reduces their real

value. However, a strong significance relationship has not been obtained to be able to say that this incidence is very high in all the countries analyzed.

The long-term interest rate has a significant impact on the price of financial markets. Variations in interest rates can affect the cost of credit, the yield of bonds and the valuation of companies. An increase in interest rates can discourage investment and consumption, which can have a negative impact on the prices of financial assets.

In addition to these macroeconomic variables, other factors such as geopolitical events, changes in monetary and fiscal policies, international business conditions, and exchange rate fluctuations can also influence financial markets. Therefore, it is crucial to consider a wide range of variables and factors when analyzing the influence of macroeconomic variables on financial markets.

It highlights the importance of a comprehensive and in-depth analysis when studying the relationship between macroeconomic variables and financial markets. Financial markets are complex and are subject to the interaction of multiple variables and events. Therefore, it is necessary to use robust methodological approaches and consider different econometric models to better understand and predict the movements of financial markets.

In conclusion, this work has shown that macroeconomic variables have a significant influence on the price of financial markets. Therefore, an affirmative answer is given to the initial question of whether there is an incidence between the macroeconomic variables and the financial markets of the OECD countries. Economic growth, inflation, and long-term interest rates can affect the prices of financial assets and the dynamics of the markets. However, it is important to recognize the complexity of this relationship and consider other external factors that can also influence financial markets.

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VII. APPENDICES

1. GLOSSARY:

A

Arbitrage:
In finance, it is used to take advantage of market inefficiencies, which can cause an asset to have different prices in two or more markets. It usually occurs in equities, forex, derivatives.... Often these inefficiencies last a very short time, so they are usually taken advantage of by expert investors.

B

Bond:
When a company or a state needs to finance itself, it can be complicated (OR unfeasible) to get all the money from a single entity. Issuing bonds is a way of distributing a loan, dividing it in equal parts. Investors can buy one or better, with the promise of repayment of principal and periodic interest payments.

Benchmark:
Saying that a stock has gone up or down may not be very relevant. The important thing is to have something to compare it to, in order to judge whether that behavior is good or bad. Thus, it is important to know whether company A has gone up, but it is more important to know whether it has become better or worse than the benchmark index or other companies in the sector. For the Spanish stock market, the benchmark index is the Ibex35.

Beta:
Statistically measures the risk of an investment, comparing it to the market. For example, a stock. If a security has $\beta > 1$, it will vary in the same direction as the market but in greater proportion; this is the case of aggressive or cyclical securities. A security with $\beta < 1$ indicates that it will vary in the same direction as the market but in smaller proportion; this is the case for defensive securities.

'Black swan':

In finance, black swans refer to events that experts consider unlikely to happen (or that have not even been considered). In the markets, there are uncertainties that are known and, therefore, we are able to assess how they will influence share prices. But unexpected events, for which we are not prepared, often generate strong distortions.

Blue chip:

This is the name given to the largest, most solid and liquid of the listed companies (such as those in the IBEX 35). It is said that they owe their name to the blue chips used in US casinos, which are the most valuable.

Broker:

It is an essential pledge for people who invest in the stock market. It is the entity that provides us with a platform to give our orders and sends them to the market, charging us a commission for that. It often offers additional services to help us in our operations.

Bull market:

A market in which stock prices are rising. It is also called bull market because of the comparison with bulls and their way of attacking, which is throwing goring from the bottom to the top.

Bear market:

Market in which stock prices are falling. It is also called bear market because of the comparison with bears and their way of attacking, which is by clawing from the top down.

C

CFD:

Contracts for difference are a derivative financial product that allows trading on price movements (shares, indices, commodities) without owning the underlying asset. They are traded on over the counter (OTC) markets; it is a contract between two parties who exchange the difference between the entry and exit price. They allow bets to be placed in both bull and bear markets and can also be used as hedges. They are leveraged and high-risk products.

CNMV:

This is the acronym used to name the National Securities Market Commission (CNMV). It is the body that supervises the securities markets in Spain. Its main objective is to protect

investors and provide transparency to the stock market trading process. There are many institutions like the CNVM around the world. The United States have the SEC (Securities and Exchange Comission).

Correlation:

In the stock market, it is used to measure how two stocks, or a stock against its benchmark index, behave with respect to each other. If the correlation is high (for example, two shares in the banking sector), this means that both companies will have the same behavior. If we want to diversify, we will look for companies with low correlation.

CTA:

One way to invest is through CTAs or trend finders. It is based on technical analysis and tries to detect trends and anticipate the movement of stocks or indexes. With this system, small profits are obtained through complex algorithmic models that analyze large amounts of information and select assets automatically.

Capital increase:

This consists of increasing the company's equity by bringing in new shareholders or allowing existing shareholders to acquire more shares. Capital increases with cost allow the company to raise funds for new projects. Liberated ones (no payment must be made for the new shares) involve a way of remunerating the shareholder (instead of giving him a dividend, he receives new shares).

Closing auction:

Our stock market finishes trading at 17:30. But from 17:30 to 17:35 the closing auction takes place (with a random margin of 30 seconds). In this auction you can enter buy and sell orders, but they will not be executed. They will only be executed at the end of the closing auction. The closing price of the auction will be an equilibrium price between bid and ask, calculated with an algorithm, and is only known after the auction has ended.

Currency:

Currency is not exactly the same as currency, but we assimilate them here for the purposes of their definition. It is a means of payment, each country has its own (although in other cases, as in the Eurozone, countries have agreed to have a common currency, the euro). In addition to paying for goods and services, they are used for speculation; we can place bets on whether one currency will perform better or worse than another. They are traded on the foreign exchange market (forex).

D

Derivatives:
They are financial instruments whose value is given by the evolution of the prices of another asset, which would be "underlying asset". There are many types of underlying assets: equities, currencies, commodities, interest rates... In a derivative transaction, the conditions of a transaction to be made at a future date are agreed today. They are leveraged products (we only disburse a small part of the transaction as collateral), so their risk is higher than when we invest in cash.

Default:
If we have bought debt (bonds, debentures...) of a company or a country, one of the main risks is that they do not pay us the interest or do not return the money invested. This will directly affect the profitability of the investment and we could end up losing everything.

Dividend:
When we buy shares of a company, we become owners of a part of the company. One of the things we are entitled to is to receive a proportional part of the profits generated by the company. The dividend is the part of the profits that is destined to remunerate the shareholder (another part can be destined to the constitution of reserves, to reduce debt, to investments...).

Dow Jones Industrial Average:
It is one of the largest stock market indexes in the world. It was created in 1896 and includes 30 companies, among the most representative of the US economy. Unlike other indexes, in which the weight of each component depends on the size of the company, in the Dow Jones the weighting is based on the listed price.

E

ETFS:
Exchange-Trade Funds are exchange-traded funds, an asset that straddles the line between traditional mutual funds and stocks. They invest in a basket of assets (like mutual funds), but are listed on the stock exchange, in real time, and can be bought and sold at any time during the session. These ETFs replicate indexes, of a very varied nature (global, sectoral...).

EuroStoxx 50:

European stock market index that brings together the largest companies in the euro zone, the largest and most liquid. It is made up of shares from different markets (Spain, France, Germany, Italy...). The companies weigh more or less in the index according to their capitalization, although none can weigh more than 10% in the index.

EPS (Earnings Per Share):

As a company's capital is divided into equal shares, the earnings per share is the proportional part of the annual profit (or loss) that corresponds to each of these shares.

F

Forex:

It is the market in which the different world currencies are traded. It is the largest and most liquid market in the world and is operational 24 hours a day, there is no opening or closing time. This market is used by central banks, financial institutions, and brokers, for different types of operations.

Fundamental analysis:

It is used to analyze companies, trying to establish what their true value is. It uses tools such as the study of balance sheets, forecasts of future income, comparison of its price in relation to that of other similar companies... If it is detected that the company is worth more than what its stock market price reflects, it is said that the company is undervalued.
If we are in the opposite situation, let's talk about overvaluation.

Financial markets:

Financial markets are the place, either physical or virtual, where all types of financial assets are traded. An example of these assets can be stocks, bonds, treasury bills, currencies.... They can be both national and international, and can be traded by different types of agents, such as banks, brokerage firms, investment funds, asset stores...

I

Ibex 35:

This is the benchmark index of the Spanish market, which has been prepared by BME since 1992, and is expressed in points. It is made up of the 35 main Spanish companies, based on

selection criteria (market capitalization and trading volume). Not all the companies have the same weight in the Ibex; it depends on their market capitalization. Its composition is reviewed periodically.

Interest rate:
They can be defined as the price to be paid for using an amount of money in a given period of time, therefore, it is the percentage that is paid to borrow money or the one received to make an investment. A rise in interest rates means that money is becoming more expensive.

Institutional investor:
These are entities that have significant amounts of money available to invest in assets (Stocks, bonds, real estate...). They include investment fund and pension plan managers, insurance companies, banks.... These investors are assumed to be more qualified, knowledgeable, and experienced, so the degree of protection offered to them by the regulations is lower than that of retail investors (individuals).

Investment Fund:
Gathers money from different investors, which will be invested by a management company. The managers are professionals and will decide which assets are the most appropriate to meet the objectives set by the fund. It has many advantages: professional management, possibility of diversifying with small amounts of money, having access to markets and sectors in which we could hardly invest otherwise....

M

Margin call:
When we are in an investment and we get dangerously deep into the loss zone, we may receive a margin call from our broker, which warns us that the collateral covering the risk of our investment is running low. Thus, we will have to provide more collateral, or our broker may close our position.

Market capitalization:
It is the total value of a company on the stock exchange. It is calculated by multiplying the number of shares listed on the stock exchange by their price. It is used to determine the size of a company. Larger companies are usually more liquid in the market. We can find from nano heads (less than 50 million dollars) to mega heads (more than 200,000 million dollars of capitalization). In Spain we have the IBEX 35 (35 largest companies), the Ibex Medium Cap for the next 20 largest and the Ibex Small Cap for the next 30.

Market timing:

We would all like to enter the market at the optimal time and sell when prices are at their peak. But knowing with certainty when this happens is very complicated and can lead to mistakes. Investing by trying to anticipate trends is called market timing, and proponents of technical analysis believe it is possible.

MSCI World Index:

It is a stock market index prepared by the company MSCI (Morgan Stanley Capital International), which includes more than 1,600 companies from different countries (USA, UK, Germany, Canada, Spain, Australia, Hong Kong, ...). The US is the country with the highest weight in the index. The MSCI World was initially a good reference for the evolution of world equities, but with the weighting of emerging markets and not being in the index, it is no longer so representative (The MSCI ACWI (All Country World Index) does include companies from emerging markets).

N

Nasdaq:

The Nasdaq (National Association of Securities Dealers Automated Quotation) is a stock exchange, where securities are exchanged. The Nasdaq 100, on the other hand, is a technology index, which brings together the 100 most significant companies in the sector.

NYSE (New York Stock Exchange):

This is the New York Stock Exchange (NYSE), the world's largest market in terms of trading volume. It was created in 1817 and brings together the largest U.S. capitalization companies. It is made up of several indexes, such as the Nyse Composite, the Dow Jones Industrials, and the S&P 500 Index.

Net profit:

It is essential to look at it before investing in a company, as it expresses the final profit or loss that a company has, after deducting costs, amortizations and provisions, interest expenses.... We must look at the ordinary or recurring net profit, which is the one related to the company's usual activity.

O

OECD:
The Organization for Economic Co-operation and Development (OECD) is the international grouping of developed countries that share some principles such as free market, democracy... It is formed by 34 member countries, among them Spain as one of the founding countries.

Opening auction:
Our stock begins trading at 9:00 a.m. (with a random 30-second spread). But before that, from 8:30 to 9:00, the opening auction takes place, where buy and sell orders are received, but not executed. The opening price of the session will be a bid-ask equilibrium price, calculated with an algorithm, and is only known once the auction is over.

P

Pay-out:
This is the percentage of profit that a company distributes among its shareholders. Thus, it is not necessary to look only at the amount in itself that we receive when we are paid dividends, but to reflect on what percentage it represents with respect to the profits obtained and whether the company is pampering its shareholders more or less.

PER (Price Earnings Ratio):
It is a very useful ratio to see if a company is cheap within its sector. PER = Price per share / annual net profit per share. Example: if a company is trading at 150 euros and has a profit of 15 euros/share, its PER will be 10 times; in other words, if nothing changes, we will need 10 years to recover our investment. A company is considered to trade cheaper the lower the PER.

Profit warning:
Negative announcement made by a company about its profit forecasts. Periodically companies give visibility on what they expect to earn, in the quarter or year. When they deviate downwards from their expectations and announce new ones, we are facing a profit warning.

R

Resistance:
It is used in technical analysis and is based on the study of the past behavior of a security's share price. It is that price level at which the market considers that the security has risen too

high, and at which there begins to be more supply than demand for securities, thus stopping the upward trend of the security.

Relevant fact:

The CNMV is the body in charge of ensuring market transparency. For this to be possible, companies must communicate any circumstance that may affect their share price, and this information is published on the CNMV's website. Relevant events are, among others, quarterly results, changes in shareholding, corporate operations, etc.

ROE (Return on Equity):

Fundamental ratio for measuring a company's profitability. ROE compares the net profit generated in relation to the company's equity. An ROE of 10% tells us that the company makes €10 profit for every €100 invested. It is not just a question of the company earning a lot, but that this profit represents an attractive return on investment.

Risk premium:

Let us keep in mind a risk-free investment, such as German debt. This investment gives us a return. From this, if we invest in a riskier asset, we will ask for an additional return to assume that extra risk. The higher the risk, the thinner we will ask to invest in the asset. It is expressed in basis points.

S

Smart beta:

When investing, often the goal is to achieve a return above the average or above the benchmark. Smart beta is a type of passive investment (it replicates a benchmark index), but introduces some modification, depending on specific criteria. Examples: they give more weight to stocks with more dividends in the index, to those with less volatility, or to those that are cheaper by PER.

Support:

It is used in technical analysis and is based on the study of the past behavior of the price of a security. It is that price level at which the market accepts that the security has already declined enough, and at which there starts to be more demand than supply of securities, thus stopping the downward trend of the security.

Stock market cycle:

It is generally accepted that markets move in large cycles, with a certain trend of quotations. It can be bullish (prices go up), bearish (prices go down) or sideways (there is no trend). There are no fixed terms, but they usually last from 5 to 7 years.

Stop loss:

This is a type of order that we place in the market, which essentially allows us to protect ourselves from unwanted losses. Thus, if I have bought some shares at 10€ and I know that I do not want to lose more than 2€ per share, I can place a stop loss at 8€; as long as the stock is trading above this level nothing will happen, but if it falls to that level the shares will be sold automatically, avoiding losses above my risk threshold. The phrase that best defines a stop loss is the following: "Limited losses, unlimited profits".

Swap:

It is a type of financial derivative, widely used to reduce risks when we are exposed to the evolution of interest or exchange rates. For example, if I have to make an important payment in dollars in 1 year and I do not want to risk the currency evolving against me, I can hedge today with a currency swap.

Stock:

The ownership of a company is divided into shares. Example: company A has a capital of 100.000€, which is made up of 10.000 shares of 10€ each. Owning a share implies that we are 'owners' of the company, so we will have the right to participate in the decisions and receive its benefits, although we also assume the risks of the business.

Safe haven asset:

There are no 100% safe assets, but gold, the Swiss franc, the dollar or US or German government bonds tend to perform well when there is tension in the markets.

T

Takeover Bid:

It is the offer made by a company interested in buying another. This offer can be in cash, shares or mixed (shares + cash). If there is a lot of interest in the company that is the object of the takeover bid, a premium is usually offered over the current share price, so that the shareholders give their approval to the operation.

Trend:
It is the direction taken by the market in time space. It can be bearish or bullish, depending on whether prices go up or down. It can be short term (if we look at only a few days or even a single session), medium or long term (we take into account a longer time horizon). There are several theories about market trends (Dow, Fibonacci. Elliot...).

Technical analysis:
Try to predict the future behavior of stock prices by analyzing historical data. It starts from the idea that markets are cyclical and past movements will be repeated in the future. Use mathematics and statistics to try to predict future trends.

Treasury stock:
It is the percentage of shares of a company that is in its own hands. Thus, the company is a shareholder of itself. Sometimes these shares are bought at times of high share price volatility, in order to stabilize the share price. At other times, they are used to distribute shares to shareholders, as a system of remuneration. Treasury shares may not account for more than 5% of the total volume of shares on the market.

V

Value investing:
Investment technique based on the selection of undervalued securities in the market. Thus, stocks that are trading below their target price are sought, hoping that in the future investors will recognize their value.

VIX:
It is not as well-known as others (Nasdaq, Ibex 35...), but it is also an index. In this case, it measures future volatility. It is produced by the Chicago options market and is calculated based on the implied volatility of the S&P 500 index options over a 30-day period. If there is uncertainty in the market and option trading increases to hedge equity portfolios, the VIX rises.

Volatility:
A statistical concept, which measures the change in the price of an asset (stock, fixed income, funds), relative to the average over a given period. A highly volatile security deviates significantly from its average, so the risk when we buy it is higher.

Volume:

In the stock market, it equals the number of traded securities (or their cash equivalent) of a stock in a given period of time. A high volume means that many investors are buying and selling this stock, so there will be no liquidity problems. Volume is also important in determining the strength of an uptrend or downtrend.

W

Warrant 'call':

It is a financial product listed on the stock exchange. It gives the theoretical right to buy an asset (shares, commodities, indices...) at a fixed price and until a certain date. Example: company A is trading at 10€; I can decide to buy it now in cash or acquire a warrant, which gives me the right to carry out the operation within a given period and at a given price.

Warrant 'put':

It is a financial product listed on the stock exchange. It gives the theoretical right to sell an asset (shares, commodities, indexes...) at a fixed price and until a certain date. Example: I am invested in company A, which is trading at €10; I can decide to sell it in cash at that moment or buy a put, which gives me the right to make the sale within a certain period and at a certain price.

Z

Zero coupon:

These are fixed income securities that do not pay a daily coupon. The yield is obtained because they are issued at a discount, i.e., for a price lower than their nominal value. For example: I buy a bill of exchange, the nominal value is €1,000; at the time of purchase, I pay for it only €990 and when it reaches maturity the State returns me €1,000.

2. STOCK MARKET INDEX GRAPHICS:

DAX 30

A line chart titled "DAX 30" showing values from 0,00 to 18.000,00 on the y-axis, with dates on the x-axis from 02/01/1995 to 02/01/2021. The line rises from about 2.000,00 in 1995 to about 16.000,00 by 2021.

BEL 20

A line chart titled "BEL 20" showing values from 0,00 to 5.000,00 on the y-axis, with dates on the x-axis from 03/01/1995 to 03/01/2021. The line rises from about 1.400,00 in 1995 to about 4.200,00 by 2021.

CAC 40

AEX 25

IBEX 35

S&P 500

IPC MEXICO

NIKKEI 225

3. INTERVIEWS WITH EXPERTS – QUESTIONS ASKED:

Do you think that macroeconomic variables have an impact on financial markets?

If so, which do you think is the variable that has a greater impact? Because?

Do you think that macroeconomic variables are the most decisive factor when it comes to affecting the financial markets?

Do you think measures should be taken to minimize this incidence? If so, what should that measure be?

How do you think the impact of macroeconomic variables on financial markets could be measured?

Do you think that knowing this incidence accurately would help investors anticipate the effects it may have on the financial markets when investing? How?

4. ECONOMETRIC REGRESSIONS GRETL

4.1. GERMANY:

```
Model 1: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANDAX30

                        coefficient    std. error    t-ratio   p-value
      --------------------------------------------------------------------
      const             -12674.5        5974.28       -2.122    0.0449   **
      GDP                    0.00755877     0.00191112  3.955    0.0006   ***
      INFLATION           -410.283         377.326      -1.087    0.2881
      LONGTERMINTEREST~    321.999         463.012       0.6954   0.4937

      Mean dependent var    7267.982    S.D. dependent var    3430.774
      Sum squared resid    25675100     S.E. of regression    1056.555
      R-squared             0.916101    Adjusted R-squared    0.905158
      F(3, 23)             83.71350     P-value(F)            1.59e-12
      Log-likelihood     -224.1415      Akaike criterion      456.2830
      Schwarz criterion   461.4663      Hannan-Quinn          457.8242
      rho                   0.617949    Durbin-Watson         0.740668

Excluding the constant, p-value was highest for variable 4 (LONGTERMINTERESTRA
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Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANDAX30

                    coefficient    std. error     t-ratio    p-value
      --------------------------------------------------------------------
      const         -8951.86        1028.66        -8.702     4.90e-09 ***
      GDP               0.00625747     0.000389275  16.07      1.09e-14 ***

      Mean dependent var    7267.982    S.D. dependent var    3430.774
      Sum squared resid    26996303     S.E. of regression    1039.159
      R-squared             0.911784    Adjusted R-squared    0.908255
      F(1, 25)            258.3957      P-value(F)            1.09e-14
      Log-likelihood     -224.8189      Akaike criterion      453.6378
      Schwarz criterion   456.2294      Hannan-Quinn          454.4084
      rho                   0.624944    Durbin-Watson         0.736511
```

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANDAX30

                coefficient    std. error    t-ratio    p-value
  -------------------------------------------------------------------
  const           7606.43       1573.84        4.833    5.74e-05  ***
  INFLATION       -234.280       984.964      -0.2379    0.8139

Mean dependent var    7267.982    S.D. dependent var     3430.774
Sum squared resid     3.05e+08    S.E. of regression     3494.764
R-squared             0.002258    Adjusted R-squared    -0.037652
F(1, 25)              0.056576    P-value(F)             0.813931
Log-likelihood       -257.5659    Akaike criterion       519.1319
Schwarz criterion     521.7236    Hannan-Quinn           519.9025
rho                   0.957824    Durbin-Watson          0.095617
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANDAX30

                    coefficient   std. error   t-ratio   p-value
  ------------------------------------------------------------------
  const                 11497.6      441.578     26.04    1.24e-19  ***
  LONGTERMINTEREST~    -1445.39      121.669    -11.88    8.91e-12  ***

Mean dependent var    7267.982    S.D. dependent var     3430.774
Sum squared resid     46052824    S.E. of regression     1357.245
R-squared             0.849513    Adjusted R-squared     0.843494
F(1, 25)              141.1274    P-value(F)             8.91e-12
Log-likelihood       -232.0291    Akaike criterion       468.0582
Schwarz criterion     470.6498    Hannan-Quinn           468.8288
rho                   0.600747    Durbin-Watson          0.816175
```

4.2. BELGIUM:

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANBEL20

                      coefficient   std. error   t-ratio  p-value
    ---------------------------------------------------------------
    const              5676.36       1980.13       2.867   0.0087  ***
    GDP                  -0.00446625    0.00433658  -1.030   0.3138
    INFLATION           130.724        133.888      0.9764  0.3390
    LONGTERMINTEREST~  -413.438        182.167     -2.270   0.0329  **

Mean dependent var   2990.035    S.D. dependent var   737.5170
Sum squared resid    7543173     S.E. of regression   572.6815
R-squared            0.466620    Adjusted R-squared   0.397049
F(3, 23)             6.707078    P-value(F)           0.002045
Log-likelihood       -207.6056   Akaike criterion     423.2112
Schwarz criterion    428.3946    Hannan-Quinn         424.7525
rho                  0.571348    Durbin-Watson        0.840040

Excluding the constant, p-value was highest for variable 3 (INFLATION)
```

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANBEL20

              coefficient    std. error    t-ratio   p-value
    ------------------------------------------------------------
    const      1290.42        481.357        2.681    0.0128  **
    GDP           0.00494132    0.00135747    3.640    0.0012  ***

Mean dependent var   2990.035    S.D. dependent var   737.5170
Sum squared resid    9243233     S.E. of regression   608.0537
R-squared            0.346408    Adjusted R-squared   0.320265
F(1, 25)             13.25019    P-value(F)           0.001241
Log-likelihood       -210.3495   Akaike criterion     424.6989
Schwarz criterion    427.2906    Hannan-Quinn         425.4696
rho                  0.651931    Durbin-Watson        0.616650
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANBEL20

              coefficient   std. error   t-ratio   p-value
  -------------------------------------------------------------
  const         3039.33      315.711       9.627    6.87e-10 ***
  INFLATION      -26.7449    152.245      -0.1757    0.8620

  Mean dependent var    2990.035    S.D. dependent var    737.5170
  Sum squared resid     14124780    S.E. of regression    751.6590
  R-squared             0.001233    Adjusted R-squared   -0.038718
  F(1, 25)              0.030860    P-value(F)            0.861968
  Log-likelihood       -216.0740    Akaike criterion      436.1480
  Schwarz criterion     438.7397    Hannan-Quinn          436.9186
  rho                   0.718174    Durbin-Watson         0.423974
```

```
Model 5: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANBEL20

                    coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------------------
  const               3759.95      206.520      18.21     6.13e-16 ***
  LONGTERMINTEREST~   -228.826      52.1689     -4.386     0.0002   ***

  Mean dependent var    2990.035    S.D. dependent var    737.5170
  Sum squared resid      7991910    S.E. of regression    565.3993
  R-squared             0.434890    Adjusted R-squared    0.412285
  F(1, 25)              19.23916    P-value(F)             0.000183
  Log-likelihood       -208.3857    Akaike criterion      420.7715
  Schwarz criterion     423.3631    Hannan-Quinn          421.5421
  rho                   0.636968    Durbin-Watson         0.684927
```

4.3. FRANCE:

```
Model 1: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANCAC40

                     coefficient    std. error    t-ratio    p-value
    ---------------------------------------------------------------------
    const               299.869       4266.71      0.07028    0.9446
    GDP                   0.00584354     0.00416834  1.402     0.1743
    INFLATION          -358.103        266.167     -1.345     0.1916
    LONGTERMINTEREST~  -607.208        379.856     -1.599     0.1236

Mean dependent var    4295.520    S.D. dependent var    1111.159
Sum squared resid    19553052     S.E. of regression     922.0264
R-squared                0.390900 Adjusted R-squared       0.311452
F(3, 23)                 4.920214 P-value(F)               0.008740
Log-likelihood        -220.4642   Akaike criterion        448.9284
Schwarz criterion      454.1118   Hannan-Quinn            450.4697
rho                      0.638745 Durbin-Watson            0.715564

Excluding the constant, p-value was highest for variable 3 (INFLATION)
```

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANCAC40

              coefficient     std. error     t-ratio    p-value
    ----------------------------------------------------------------
    const     1241.78         903.937        1.374      0.1817
    GDP          0.00162654     0.000471877  3.447      0.0020   ***

Mean dependent var    4295.520    S.D. dependent var    1111.159
Sum squared resid    21759950     S.E. of regression     932.9512
R-squared                0.322153 Adjusted R-squared       0.295039
F(1, 25)                11.88147  P-value(F)               0.002016
Log-likelihood        -221.9079   Akaike criterion        447.8158
Schwarz criterion      450.4075   Hannan-Quinn            448.5864
rho                      0.712152 Durbin-Watson            0.506576
```

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANCAC40

                 coefficient   std. error   t-ratio   p-value
      ---------------------------------------------------------------
      const        3201.25       372.134      8.602    6.10e-09  ***
      INFLATION     78.1622       23.2282     3.365    0.0025    ***

Mean dependent var    4295.520    S.D. dependent var    1111.159
Sum squared resid    22094482     S.E. of regression     940.0954
R-squared             0.311732    Adjusted R-squared      0.284201
F(1, 25)             11.32305     P-value(F)               0.002473
Log-likelihood      -222.1139     Akaike criterion        448.2277
Schwarz criterion    450.8194     Hannan-Quinn            448.9984
rho                   0.707956    Durbin-Watson             0.508711
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANCAC40

                      coefficient   std. error   t-ratio   p-value
      ---------------------------------------------------------------
      const             5299.93       331.971     15.97    1.27e-14  ***
      LONGTERMINTEREST~ -310.868       86.8592    -3.579    0.0014    ***

Mean dependent var    4295.520    S.D. dependent var    1111.159
Sum squared resid    21226037     S.E. of regression     921.4345
R-squared             0.338785    Adjusted R-squared      0.312336
F(1, 25)             12.80917     P-value(F)               0.001447
Log-likelihood      -221.5725     Akaike criterion        447.1450
Schwarz criterion    449.7367     Hannan-Quinn            447.9157
rho                   0.687521    Durbin-Watson             0.583139
```

4.4. NETHERLANDS:

```
Model 1: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANAEX25

                      coefficient    std. error    t-ratio   p-value
    ---------------------------------------------------------------------
    const               585.140        330.085        1.773    0.0895   *
    GDP                  -0.000194960    0.000422773   -0.4611   0.6490
    INFLATION            56.1072        28.7945        1.949    0.0637   *
    LONGTERMINTEREST~    -44.3251       30.0553       -1.475    0.1538

Mean dependent var    439.6748    S.D. dependent var    124.7992
Sum squared resid     285208.1    S.E. of regression    111.3569
R-squared             0.295688    Adjusted R-squared    0.203821
F(3, 23)              3.218661    P-value(F)            0.041502
Log-likelihood       -163.3907    Akaike criterion      334.7814
Schwarz criterion     339.9647    Hannan-Quinn          336.3227
rho                   0.655484    Durbin-Watson         0.656065

Excluding the constant, p-value was highest for variable 2 (GDP)
```

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANAEX25

                 coefficient     std. error    t-ratio   p-value
    ---------------------------------------------------------------------
    const          241.949         95.1370        2.543    0.0176   **
    GDP            0.000333437     0.000155876    2.139    0.0424   **

Mean dependent var    439.6748    S.D. dependent var    124.7992
Sum squared resid     342294.9    S.E. of regression    117.0120
R-squared             0.154714    Adjusted R-squared    0.120903
F(1, 25)              4.575791    P-value(F)            0.042379
Log-likelihood       -165.8538    Akaike criterion      335.7076
Schwarz criterion     338.2993    Hannan-Quinn          336.4783
rho                   0.799023    Durbin-Watson         0.393525
```

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANAEX25

                  coefficient   std. error   t-ratio   p-value
  -----------------------------------------------------------------
  const            388.297       61.8902       6.274    1.45e-06 ***
  INFLATION         26.9486      29.8990       0.9013   0.3760

Mean dependent var    439.6748    S.D. dependent var    124.7992
Sum squared resid     392201.1    S.E. of regression    125.2519
R-squared             0.031472    Adjusted R-squared   -0.007269
F(1, 25)              0.812378    P-value(F)            0.376020
Log-likelihood       -167.6912    Akaike criterion      339.3824
Schwarz criterion     341.9741    Hannan-Quinn          340.1530
rho                   0.778608    Durbin-Watson         0.386011
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANAEX25

                       coefficient   std. error   t-ratio   p-value
  ----------------------------------------------------------------------
  const                 516.231       39.5560      13.05     1.16e-12 ***
  LONGTERMINTEREST~     -24.8008      10.6086      -2.338    0.0277   **

Mean dependent var    439.6748    S.D. dependent var    124.7992
Sum squared resid     332300.3    S.E. of regression    115.2910
R-squared             0.179395    Adjusted R-squared    0.146571
F(1, 25)              5.465345    P-value(F)            0.027700
Log-likelihood       -165.4538    Akaike criterion      334.9075
Schwarz criterion     337.4992    Hannan-Quinn          335.6782
rho                   0.782463    Durbin-Watson         0.430793
```

4.5.   SPAIN:

```
Model 1: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANIBEX35
```

	coefficient	std. error	t-ratio	p-value
const	5686.03	3379.10	1.683	0.1060
GDP	0.00418781	0.00264861	1.581	0.1275
INFLATION	198.098	340.602	0.5816	0.5665
LONGTERMINTEREST~	−198.462	295.619	−0.6713	0.5087

Mean dependent var	9176.112	S.D. dependent var	2323.266
Sum squared resid	95788471	S.E. of regression	2040.764
R-squared	0.317438	Adjusted R-squared	0.228409
F(3, 23)	3.565530	P-value(F)	0.029756
Log-likelihood	−241.9159	Akaike criterion	491.8317
Schwarz criterion	497.0151	Hannan-Quinn	493.3730
rho	0.712153	Durbin-Watson	0.527370

Excluding the constant, p-value was highest for variable 3 (INFLATION)

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANIBEX35
```

	coefficient	std. error	t-ratio	p-value	
const	4375.14	1511.55	2.894	0.0078	***
GDP	0.00520242	0.00158500	3.282	0.0030	***

Mean dependent var	9176.112	S.D. dependent var	2323.266
Sum squared resid	98073531	S.E. of regression	1980.642
R-squared	0.301156	Adjusted R-squared	0.273202
F(1, 25)	10.77335	P-value(F)	0.003035
Log-likelihood	−242.2341	Akaike criterion	488.4682
Schwarz criterion	491.0599	Hannan-Quinn	489.2389
rho	0.700997	Durbin-Watson	0.504088

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANIBEX35

               coefficient   std. error   t-ratio   p-value
  -----------------------------------------------------------------
  const          9877.82        806.285      12.25    4.60e-12  ***
  INFLATION      -320.731       306.916      -1.045   0.3060

Mean dependent var     9176.112    S.D. dependent var    2323.266
Sum squared resid      1.34e+08    S.E. of regression    2319.165
R-squared              0.041854    Adjusted R-squared    0.003528
F(1, 25)               1.092053    P-value(F)            0.306016
Log-likelihood        -246.4943    Akaike criterion      496.9887
Schwarz criterion      499.5804    Hannan-Quinn          497.7593
rho                    0.702231    Durbin-Watson         0.409731
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANIBEX35

                      coefficient   std. error   t-ratio   p-value
  -----------------------------------------------------------------
  const                 11026.3        784.722      14.05    2.27e-13  ***
  LONGTERMINTEREST~     -454.467       165.850      -2.740   0.0112    **

Mean dependent var     9176.112    S.D. dependent var    2323.266
Sum squared resid      1.08e+08    S.E. of regression    2077.708
R-squared              0.230980    Adjusted R-squared    0.200219
F(1, 25)               7.508901    P-value(F)            0.011165
Log-likelihood        -243.5259    Akaike criterion      491.0519
Schwarz criterion      493.6435    Hannan-Quinn          491.8225
rho                    0.772120    Durbin-Watson         0.431693
```

4.6. USA:

```
Model 1: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANSP500

                       coefficient     std. error    t-ratio   p-value
   ---------------------------------------------------------------------
   const             -2870.19          1175.64        -2.441    0.0227   **
   GDP                   0.000244174      5.04970e-05   4.835    7.02e-05 ***
   INFLATION            54.0348          82.1037        0.6581   0.5170
   LONGTERMINTEREST~   216.614          141.276        1.533    0.1389

Mean dependent var    1618.206    S.D. dependent var   855.1459
Sum squared resid     3558175     S.E. of regression   393.3234
R-squared             0.812857    Adjusted R-squared   0.788447
F(3, 23)              33.30023     P-value(F)           1.53e-08
Log-likelihood       -197.4618    Akaike criterion     402.9236
Schwarz criterion     408.1069    Hannan-Quinn         404.4648
rho                   0.804557    Durbin-Watson        0.485501

Excluding the constant, p-value was highest for variable 3 (INFLATION)
```

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANSP500

              coefficient      std. error    t-ratio    p-value
   -------------------------------------------------------------------
   const    -828.514          277.107        -2.990    0.0062    ***
   GDP         0.000168112       1.82292e-05   9.222    1.60e-09  ***

Mean dependent var    1618.206    S.D. dependent var   855.1459
Sum squared resid     4319305     S.E. of regression   415.6588
R-squared             0.772825    Adjusted R-squared   0.763738
F(1, 25)              85.04744     P-value(F)           1.60e-09
Log-likelihood       -200.0787    Akaike criterion     404.1574
Schwarz criterion     406.7491    Hannan-Quinn         404.9281
rho                   0.882834    Durbin-Watson        0.228993
```

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANSP500

                 coefficient   std. error   t-ratio   p-value
  ----------------------------------------------------------------
  const            1551.46       395.070      3.927     0.0006   ***
  INFLATION          29.4681     157.925      0.1866    0.8535

Mean dependent var    1618.206    S.D. dependent var     855.1459
Sum squared resid     18986695    S.E. of regression     871.4745
R-squared             0.001391    Adjusted R-squared    -0.038554
F(1, 25)              0.034818    P-value(F)              0.853483
Log-likelihood       -220.0674    Akaike criterion       444.1348
Schwarz criterion     446.7265    Hannan-Quinn           444.9055
rho                   0.979436    Durbin-Watson           0.079326
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANSP500

                      coefficient   std. error   t-ratio   p-value
  --------------------------------------------------------------------
  const                 3053.16       282.155     10.82     6.37e-11  ***
  LONGTERMINTEREST~     -382.675        69.0174    -5.545    9.17e-06  ***

Mean dependent var    1618.206    S.D. dependent var     855.1459
Sum squared resid      8527181    S.E. of regression     584.0267
R-squared             0.551511    Adjusted R-squared     0.533572
F(1, 25)              30.74275    P-value(F)              9.17e-06
Log-likelihood       -209.2609    Akaike criterion       422.5219
Schwarz criterion     425.1135    Hannan-Quinn           423.2925
rho                   0.967435    Durbin-Watson           0.357370
```

4.7. MEXICO:

```
Model 1: OLS, using observations 2002-2006 (T = 5)
Dependent variable: COTIZACIANINDICEIPCMEXICO

                      coefficient     std. error    t-ratio    p-value
    ---------------------------------------------------------------------
    const              -15590.2         36020.4      -0.4328    0.7400
    GDP                    0.00420472       0.00199046  2.112    0.2815
    INFLATION           -1839.21          5542.43     -0.3318    0.7960
    LONGTERMINTEREST~    -129.547          2458.37     -0.05270   0.9665

Mean dependent var   12449.34    S.D. dependent var    6494.233
Sum squared resid     3139862    S.E. of regression    1771.966
R-squared            0.981388    Adjusted R-squared    0.925552
F(3, 1)              17.57619    P-value(F)            0.173163
Log-likelihood      -40.47032    Akaike criterion      88.94064
Schwarz criterion    87.37839    Hannan-Quinn          84.74772
rho                 -0.060435    Durbin-Watson         1.501619

Excluding the constant, p-value was highest for variable 4 (LONGTERMINTERESTR
```

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANINDICEIPCMEXICO

              coefficient     std. error    t-ratio    p-value
    -------------------------------------------------------------------
    const      -4480.72         2357.66      -1.900     0.0690    *
    GDP            0.00232098       0.000160500  14.46     1.20e-13  ***

Mean dependent var   25565.28    S.D. dependent var    17373.62
Sum squared resid    8.38e+08    S.E. of regression    5789.756
R-squared            0.893216    Adjusted R-squared    0.888945
F(1, 25)             209.1172    P-value(F)            1.20e-13
Log-likelihood      -271.1962    Akaike criterion      546.3924
Schwarz criterion    548.9841    Hannan-Quinn          547.1630
rho                  0.904300    Durbin-Watson         0.253093
```

```
Model 3: OLS, using observations 1995–2021 (T = 27)
Dependent variable: COTIZACIANINDICEIPCMEXICO

                  coefficient   std. error   t-ratio   p-value
  ---------------------------------------------------------------
  const             35422.1       3758.00      9.426    1.04e-09  ***
  INFLATION        -1191.52        313.967     -3.795    0.0008    ***

Mean dependent var    25565.28    S.D. dependent var    17373.62
Sum squared resid     4.98e+09    S.E. of regression    14112.86
R-squared             0.365522    Adjusted R-squared    0.340143
F(1, 25)              14.40250    P-value(F)            0.000837
Log-likelihood       -295.2531    Akaike criterion      594.5062
Schwarz criterion     597.0979    Hannan–Quinn          595.2768
rho                   0.959658    Durbin–Watson         0.128610
```

```
Model 4: OLS, using observations 2002–2006 (T = 5)
Dependent variable: COTIZACIANINDICEIPCMEXICO

                      coefficient   std. error   t-ratio   p-value
  -----------------------------------------------------------------
  const                 81070.9       36316.0      2.232    0.1118
  LONGTERMINTEREST~     -7386.47       3901.48     -1.893    0.1547

Mean dependent var    12449.34    S.D. dependent var    6494.233
Sum squared resid     76863790    S.E. of regression    5061.745
R-squared             0.544377    Adjusted R-squared    0.392502
F(1, 3)               3.584385    P-value(F)            0.154658
Log-likelihood       -48.46496    Akaike criterion      100.9299
Schwarz criterion     100.1488    Hannan–Quinn          98.83346
rho                   0.167340    Durbin–Watson         1.583402
```

4.8. JAPAN:

```
Model 1: OLS, using observations 1995-2020 (T = 26)
Dependent variable: COTIZACIANNIKKEI225

                        coefficient      std. error      t-ratio   p-value
        ---------------------------------------------------------------------
        const            -86143.4          21732.0         -3.964   0.0007   ***
        GDP                0.000191741      4.08017e-05     4.699    0.0001   ***
        INFLATION         631.452           784.982         0.8044   0.4298
        LONGTERMINTEREST~ -10.3959          730.220        -0.01424  0.9888

Mean dependent var    15421.87    S.D. dependent var    4618.351
Sum squared resid     2.28e+08    S.E. of regression    3220.960
R-squared             0.571965    Adjusted R-squared    0.513596
F(3, 22)              9.799214    P-value(F)            0.000266
Log-likelihood       -244.7340    Akaike criterion      497.4680
Schwarz criterion     502.5004    Hannan-Quinn          498.9172
rho                   0.464273    Durbin-Watson         0.892897

Excluding the constant, p-value was highest for variable 4 (LONGTERMINTERESTRA
```

```
Model 2: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANNIKKEI225

                coefficient       std. error      t-ratio   p-value
        ---------------------------------------------------------------------
        const    -102418            20799.8         -4.924   4.54e-05 ***
        GDP        0.000223196      3.92268e-05      5.690   6.33e-06 ***

Mean dependent var    15870.69    S.D. dependent var    5093.892
Sum squared resid     2.94e+08    S.E. of regression    3429.063
R-squared             0.564269    Adjusted R-squared    0.546840
F(1, 25)              32.37487    P-value(F)            6.33e-06
Log-likelihood       -257.0535    Akaike criterion      518.1070
Schwarz criterion     520.6987    Hannan-Quinn          518.8777
rho                   0.640252    Durbin-Watson         0.657552
```

Model 3: OLS, using observations 1995–2020 (T = 26)
Dependent variable: COTIZACIANNIKKEI225

	coefficient	std. error	t-ratio	p-value	
const	15114.8	878.253	17.21	5.26e–15	***
INFLATION	1893.45	1006.33	1.882	0.0721	*

Mean dependent var	15421.87	S.D. dependent var	4618.351
Sum squared resid	4.65e+08	S.E. of regression	4400.209
R-squared	0.128547	Adjusted R-squared	0.092236
F(1, 24)	3.540209	P-value(F)	0.072082
Log-likelihood	−253.9764	Akaike criterion	511.9529
Schwarz criterion	514.4691	Hannan–Quinn	512.6775
rho	0.784088	Durbin–Watson	0.509829

Model 4: OLS, using observations 1995–2021 (T = 27)
Dependent variable: COTIZACIANNIKKEI225

	coefficient	std. error	t-ratio	p-value	
const	17504.5	1579.27	11.08	3.86e–11	***
LONGTERMINTEREST~	−1411.79	1078.83	−1.309	0.2026	

Mean dependent var	15870.69	S.D. dependent var	5093.892
Sum squared resid	6.31e+08	S.E. of regression	5025.496
R-squared	0.064109	Adjusted R-squared	0.026674
F(1, 25)	1.712526	P-value(F)	0.202561
Log-likelihood	−267.3739	Akaike criterion	538.7478
Schwarz criterion	541.3395	Hannan–Quinn	539.5185
rho	0.876579	Durbin–Watson	0.288827

4.9. BRAZIL:

```
Model 1: OLS, using observations 1995–2020 (T = 26)
Dependent variable: COTIZACIANBOVESPA

                       coefficient      std. error    t-ratio  p-value
    -------------------------------------------------------------------
    const                25449.3          17368.2       1.465   0.1570
    GDP                   0.00972580       0.00185831    5.234   3.00e-05 ***
    INFLATION            215.378          432.843        0.4976  0.6237
    LONGTERMINTEREST~   -2072.76          1658.63       -1.250   0.2245

Mean dependent var    43162.68    S.D. dependent var    30725.69
Sum squared resid     4.00e+09    S.E. of regression    13489.95
R-squared             0.830371    Adjusted R-squared    0.807240
F(3, 22)              35.89830    P-value(F)            1.19e-08
Log-likelihood       -281.9729    Akaike criterion      571.9458
Schwarz criterion     576.9782    Hannan-Quinn          573.3949
rho                   0.870276    Durbin-Watson          0.404051

Excluding the constant, p-value was highest for variable 3 (INFLATION)
```

```
Model 2: OLS, using observations 1995–2020 (T = 26)
Dependent variable: COTIZACIANBOVESPA

                coefficient     std. error     t-ratio   p-value
    -----------------------------------------------------------------
    const         1571.85         4900.80        0.3207    0.7512
    GDP           0.0118744       0.00117199    10.13      3.80e-10 ***

Mean dependent var    43162.68    S.D. dependent var    30725.69
Sum squared resid     4.47e+09    S.E. of regression    13650.90
R-squared             0.810508    Adjusted R-squared    0.802613
F(1, 24)              102.6545    P-value(F)            3.80e-10
Log-likelihood       -283.4124    Akaike criterion      570.8249
Schwarz criterion     573.3411    Hannan-Quinn          571.5494
rho                   0.877882    Durbin-Watson          0.360350
```

```
Model 3: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANBOVESPA

                 coefficient   std. error   t-ratio   p-value
   ----------------------------------------------------------------
   const          54074.1       7531.64      7.180     1.59e-07  ***
   INFLATION       -966.963      518.247     -1.866     0.0738     *

Mean dependent var    45643.90     S.D. dependent var    32771.66
Sum squared resid     2.45e+10     S.E. of regression     31311.57
R-squared             0.122232     Adjusted R-squared     0.087121
F(1, 25)              3.481336     P-value(F)             0.073841
Log-likelihood       -316.7694     Akaike criterion       637.5389
Schwarz criterion     640.1305     Hannan-Quinn           638.3095
rho                   0.994002     Durbin-Watson          0.169611
```

```
Model 4: OLS, using observations 1995-2021 (T = 27)
Dependent variable: COTIZACIANBOVESPA

                      coefficient   std. error   t-ratio   p-value
   ----------------------------------------------------------------------
   const                95479.0      10570.2       9.033    2.40e-09  ***
   LONGTERMINTEREST~    -5762.33      1108.19      -5.200    2.22e-05  ***

Mean dependent var    45643.90     S.D. dependent var    32771.66
Sum squared resid     1.34e+10     S.E. of regression     23164.70
R-squared             0.519578     Adjusted R-squared     0.500361
F(1, 25)              27.03753     P-value(F)             0.000022
Log-likelihood       -308.6328     Akaike criterion       621.2655
Schwarz criterion     623.8572     Hannan-Quinn           622.0362
rho                   0.791675     Durbin-Watson          0.352810
```

4.10. CHINA:

```
Model 1: OLS, using observations 2014-2021 (T = 8)
Dependent variable: COTIZACIANHANGSENG
```

	coefficient	std. error	t-ratio	p-value	
const	−8424.93	11004.9	−0.7656	0.4866	
GDP	0.00930206	0.00292411	3.181	0.0335	**
INFLATION	1092.27	952.083	1.147	0.3152	
LONGTERMINTEREST~	2149.34	1558.81	1.379	0.2400	

Mean dependent var	25273.87	S.D. dependent var	2394.289
Sum squared resid	9887782	S.E. of regression	1572.242
R-squared	0.753596	Adjusted R-squared	0.568793
F(3, 4)	4.077834	P-value(F)	0.104009
Log-likelihood	−67.46098	Akaike criterion	142.9220
Schwarz criterion	143.2397	Hannan-Quinn	140.7788
rho	−0.497450	Durbin-Watson	2.981743

```
Excluding the constant, p-value was highest for variable 3 (INFLATION)
```

```
Model 2: OLS, using observations 2000-2021 (T = 22)
Dependent variable: COTIZACIANHANGSENG
```

	coefficient	std. error	t-ratio	p-value	
const	3882.53	1957.69	1.983	0.0612	*
GDP	0.00838369	0.000954938	8.779	2.69e-08	***

Mean dependent var	20414.74	S.D. dependent var	5398.137
Sum squared resid	1.26e+08	S.E. of regression	2510.712
R-squared	0.793976	Adjusted R-squared	0.783675
F(1, 20)	77.07629	P-value(F)	2.69e-08
Log-likelihood	−202.3913	Akaike criterion	408.7826
Schwarz criterion	410.9647	Hannan-Quinn	409.2967
rho	0.450756	Durbin-Watson	1.083482

Model 3: OLS, using observations 1995–2021 (T = 27)
Dependent variable: COTIZACIANHANGSENG

	coefficient	std. error	t-ratio	p-value	
const	19387.8	1495.61	12.96	1.35e-12	***
INFLATION	−241.160	334.590	−0.7208	0.4777	

Mean dependent var	18726.83	S.D. dependent var	6082.213
Sum squared resid	9.42e+08	S.E. of regression	6139.206
R-squared	0.020357	Adjusted R-squared	−0.018829
F(1, 25)	0.519500	P-value(F)	0.477741
Log-likelihood	−272.7785	Akaike criterion	549.5571
Schwarz criterion	552.1487	Hannan–Quinn	550.3277
rho	0.879608	Durbin–Watson	0.230606

Model 4: OLS, using observations 2014–2021 (T = 8)
Dependent variable: COTIZACIANHANGSENG

	coefficient	std. error	t-ratio	p-value	
const	25483.7	7731.83	3.296	0.0165	**
LONGTERMINTEREST~	−63.1772	2311.64	−0.02733	0.9791	

Mean dependent var	25273.87	S.D. dependent var	2394.289
Sum squared resid	40123336	S.E. of regression	2585.966
R-squared	0.000124	Adjusted R-squared	−0.166521
F(1, 6)	0.000747	P-value(F)	0.979083
Log-likelihood	−73.06362	Akaike criterion	150.1272
Schwarz criterion	150.2861	Hannan–Quinn	149.0556
rho	0.517261	Durbin–Watson	0.889016