Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Master's Thesis

Evaluation of Bolivia's Fiscal Policy in the Context of Historical Events

Author of the thesis

Omar Darío ALVAREZ MEJIA

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

Eng. Omar Darío Alvarez Mejía

Economics and Management

Thesis title

Evaluation of the selected Bolivia's fiscal policy in the context of historical events

---

Objectives of thesis

The main objective of this thesis is to evaluate the effectiveness of fiscal policy in Bolivia in promoting economic growth and addressing income inequality. To achieve this goal, the first sub-objective is to identify the appropriate fiscal policy that can encourage economic growth in Bolivia. The second sub-objective is to demonstrate that developing economies are characterized by low levels of income and investment. The third sub-objective is to propose fiscal tools that can be used to redistribute income in favor of the poor. Additionally, this thesis aims to determine how fiscal policy tools can be employed to contain inflationary and deflationary tendencies in the Bolivian economy. Finally, it is important to identify how the Bolivian fiscal policy influences GDP.

Methodology

This thesis will use a qualitative methodology case study approach to evaluate Bolivia's fiscal policy. The data will be collected through a variety of sources, including literature reviews, primary and secondary data sources, and key informant interviews. To analyze the data, a thematic analysis approach will be employed. In order to ensure the validity and reliability of the data, triangulation will be utilized, and ethical considerations will be taken into account. The limitations and challenges of the research methodology will also be acknowledged and discussed. The results of the thesis will be presented clearly using tables, charts, and diagrams. The implications and recommendations will be discussed in the context of existing literature and policy debates, aiming to contribute to the field of fiscal policy evaluation.

The proposed extent of the thesis

60 – 80

Keywords

Bolivia, Economic development, Fiscal policy, Government, Historical events, Social development

Recommended information sources

ANDERSSON, Krister; GIBSON, Clark C. Decentralized governance and environmental change: Local institutional moderation of deforestation in Bolivia. Journal of Policy Analysis and Management, 2007, vol. 26, no 1, p. 99-123.

ARAUCO, Verónica Paz, et al. Explaining low redistributive impact in Bolivia. Public Finance Review, 2014, vol. 42, no 3, p. 326-345.

CONTRERAS, Manuel E. Debt, taxes, and war: the political economy of Bolivia, c. 1920–1935. Journal of Latin American Studies, 1990, vol. 22, no 1-2, p. 265-287.

JENKINS, Glenn, et al. A Review Of Tax Policies And Administration In Bolivia. Development Discussion Papers, 1991, no 1991-10.

KAIMOWITZ, David; THIELE, Graham; PACHECO, Pablo. The effects of structural adjustment on deforestation and forest degradation in lowland Bolivia. World Development, 1999, vol. 27, no 3, p. 505-520.

KOHL, Benjamin. Challenges to neoliberal hegemony in Bolivia. Antipode, 2006, vol. 38, no 2, p. 304-326.

LUSTIG, Nora; PESSINO, Carola; SCOTT, John. The impact of taxes and social spending on inequality and poverty in Argentina, Bolivia, Brazil, Mexico, Peru, and Uruguay:

MACHICADO, Carlos Gustavo; ESTRADA, Paúl. Fiscal policy and economic growth: a simulation analysis for Bolivia. Analítika: revista de análisis estadístico, 2012, no 4, p. 57-82.

Expected date of thesis defence

2023/24 SS – PEF

The Diploma Thesis Supervisor

Ing. David Křížek, Ph.D.

Supervising department

Department of Economic Theories

Electronic approval: 17. 10. 2023

prof. Ing. PhDr. Lucie Severová, Ph.D.

Head of department

Electronic approval: 3. 11. 2023

doc. Ing. Tomáš Šubrt, Ph.D.

Dean

Prague on 26. 03. 2024

Declaration

I declare that I have worked on my master's thesis titled "Evaluation of Bolivia's Fiscal Policy in the Context of Historical Events" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on March 31st, 2024 _____

Acknowledgement

I would like to thank my thesis supervisor, Ing. David Křížek, Ph.D. and all other persons, for their advice and support during my work on this thesis.

Evaluation of Bolivia's Fiscal Policy in the Context of Historical Events

Abstract

This thesis, delves into the intricate relationship between Bolivia's fiscal policy and its economic development amidst historical events. Structured into several sections, the thesis embarks with an introduction laying the foundation for understanding the pivotal role of fiscal policy in shaping Bolivia's economic trajectory. Following this, the objectives and methodologies are elucidated, delineating the research goals, hypotheses, and the quantitative methodology employed.

A meticulous review of pertinent literature explores fiscal and monetary policy. The practical segment involves the development of the economic and econometric model to analyse crucial economic indicators such as gross domestic product, government revenue, expenditure, and consumption.

The results of the analysis indicate significant findings: government revenue and final consumption expenditure positively influence the GDP, while government expenditure negatively affects it. Elasticity coefficients highlight the impact of each independent variable on GDP, with final consumption expenditure exhibiting a notable positive effect.

Keywords: Bolivia, fiscal, monetary policy, macroeconomic indicators, gross domestic product, government revenue, government expenditure, consumption, economic growth.

Hodnocení bolívijské fiskální politiky
v kontextu historických událostí

Abstrakt

Tato práce se ponoří do složitého vztahu mezi bolívijskou fiskální politikou a jejím ekonomickým vývojem během historických událostí. Práce je rozdělena do několika částí a začíná úvodem, který pokládá základy pro pochopení klíčové role fiskální politiky při utváření ekonomické trajektorie Bolívie. Následně jsou objasněny cíle a metodiky, vymezují se cíle výzkumu, hypotézy a použitá kvantitativní metodologie.

Pečlivý přehled příslušné literatury zkoumá fiskální a měnovou politiku. Praktická část zahrnuje vývoj ekonomického a ekonometrického modelu pro analýzu klíčových ekonomických ukazatelů, jako je hrubý domácí produkt, vládní příjmy, výdaje a spotřeba.

Výsledky analýzy naznačují významná zjištění: vládní příjmy a výdaje na konečnou spotřebu ovlivňují HDP pozitivně, zatímco vládní výdaje jej ovlivňují negativně. Koeficienty elasticity zdůrazňují dopad každé nezávislé proměnné na HDP, přičemž výdaje na konečnou spotřebu vykazují pozoruhodný pozitivní efekt.

Klíčová slova: Bolívie, fiskální, monetární politika, makroekonomické ukazatele, hrubý domácí produkt, vládní příjmy, vládní výdaje, spotřeba, ekonomický růst.

Table of content

List of pictures, tables, graphs and abbreviations

List of Tables

List of Graphs

List of Figures

List of abbreviations

CAF	Development bank of Latin America and the Caribbean
IMF	International Monetary Found
INE	Statistical National Institute
BCB	Central Bank from Bolivia
MAS	Movement for Socialism
CPE	Political Constitution of the State
OAS	Organization of American States
IACHR	Inter-American Commission on Human Rights
ICJ	International Court of Justice
ANB	Bolivian National Customs Agency
WB	World Bank
ECB	European Central Bank
MESCP	Multi-Sector Economic and Social Community Policy
LPG	Liquefied Petroleum Gas
IGAE	Global Economic Activity Index
CPI	Consumer Price Index
PMIs	Manufacturing purchasing manager indices
OECD	Organization for Economic Co-operation and Development
GNP	Gross National Product
GNI	Gross National Income
PPP	Purchasing Power Parity
OMO	Open Market Operations
FCE	Final Consumption Expenditure
GDP	Gross Domestic Product
OLSM	Ordinary least squares

1. Introduction

In South America, Bolivia is a landlocked nation bordered to the east and north by Brazil, to the south by Argentina and Paraguay, and the west by Chile and Peru. There are nine departments in this democratic republic. Sucre is the capital city, however, La Paz is home to the government. The official languages of Bolivia is Spanish and includes several indigenous languages. The national currency is the boliviano (BOB).

Bolivia has a distinctive and varied economic environment that is intricately linked to its natural riches, rich cultural legacy, and historical difficulties. Bolivia, a country with a population of more than 12 million, depends heavily on its economy for both the welfare of its people and the whole area (World Bank, 2023). This succinct synopsis explores Bolivia's economy's main features, historical importance, and prospects and problems.

Bolivia's economy is distinguished by its remarkable diversification, which includes industry, mining, agriculture, and a rapidly expanding service sector. The nation is endowed with an abundance of natural resources, especially in the mining sector, where it possesses large quantities of minerals including lithium, silver, and tin. As a result, it is a major participant in the global commodities market (United Nations Comtrade, 2023). Furthermore, Bolivia has significant agricultural potential, with rich soils that may provide a range of crops for sale and home use, from soybeans to quinoa (FAOSTAT, 2023).

Bolivia has been working hard in recent years to alleviate the environmental problems brought on by its extractive industries, diversify its economy, and lower poverty (The Economist, 2023). Bolivia is putting itself in a position to dominate the global clean energy scene because of its enormous lithium deposits, a vital resource in the electric car revolution. Additionally, social programs and government initiatives to improve income distribution have significantly improved access to healthcare and education, decreased poverty, and improved education (World Bank, 2023).

Comprehending Bolivia's economy is not only essential for the country, but it also has wider regional implications. Bolivia's economic trajectory affects the stability and prosperity of the whole region as a member of the Andean Community and a significant participant in South American commerce (CAF - banco de desarrollo de América Latina, 2023). This review sheds light on the variables influencing Bolivia's economic

development and relevance in the global context while serving as a starting point for further investigation of the country's numerous sectors, possibilities, and difficulties.

Evaluating fiscal policy within the context of Bolivia is a critical necessity with far-reaching implications for the nation's economic stability, social well-being, and future development. This thesis serves as an indispensable tool in understanding the impact and effectiveness of the government's taxation and expenditure strategies, particularly in a country where economic growth, resource abundance, and social equity are closely intertwined.

Bolivia's fiscal policy, marked by a delicate balance of raising revenue through taxation and judicious allocation of government expenditure, plays a pivotal role in the nation's socioeconomic landscape. The importance of evaluating this policy is rooted in several key dimensions that significantly influence Bolivia's present and future.

The topic was chosen because over the past decade (2013-2022), Bolivia has witnessed a dynamic interplay of historical, economic, and political events that have shaped the nation's trajectory. A backdrop to this period is Bolivia's historical struggle with political instability, social inequality, and economic challenges.

2. Objectives and Methodology

2.1 Objectives and Hypotheses

The main objective of this thesis is to evaluate the impact of Bolivia's fiscal policy on its economic and social development. This research will identify and analyze the key factors that have influenced Bolivia's fiscal policy over time. To achieve this goal, the first sub-objective is to demonstrate the relationship between government revenue, government expenditure and the consumption on the gross domestic product. The second sub-objective is to identify the Bolivia' fiscal policies that affects positively or negatively the economic growth. Additionally, this thesis aims to determine how fiscal policy tools can be employed to contain inflationary and deflationary tendencies in the Bolivian economy.

Hypotheses: The fiscal policy exerts a significant impact on Bolivia's economic development, as it influences the economy and, consequently, the country's GDP through the utilization of government revenue, government expenditure, and consumption.

Gross Domestic Product $\mathbf{Y_{1t}}$

Government revenue $\mathbf{X_{2t}}$

Government expenditure $\mathbf{X_{3t}}$

Final consumption expenditure $\mathbf{X_{4t}}$

1. Effect of Government revenue (X_{2t})**:**

- ➤ **Null Hypothesis (H0):** There is no significant relationship between government revenue (X_{2t}) and the GDP (Y_{1t}).
- ➤ **Alternative Hypothesis (H1):** There is a significant positive/negative relationship between government revenue (X_{2t}) and the GDP (Y_{1t}).

2. Effect of Government expenditure (X_{3t})**:**

- ➤ **Null Hypothesis (H0):** There is no significant relationship between the government expenditure (X_{3t}) and the GDP (Y_{1t}).
- ➤ **Alternative Hypothesis (H):** There is a significant positive/negative relationship between the government expenditure (X_{3t}) and the GDP (Y_{1t}).

3. Effect of Final consumption expenditure (X_{4t})**:**

- ➢ **Null Hypothesis (H0):** There is no significant relationship between consumption (X_{4t}) and the GDP (Y_{1t}).
- ➢ **Alternative Hypothesis (H1):** There is a significant positive/negative relationship between consumption (X_{4t}) and the GDP (Y_{1t}).

2.2 Methodology

This thesis will use a quantitative methodology case study approach to evaluate Bolivia's fiscal policy. The data will be collected mainly through the International Monetary Found (IMF) Website and as a secondary data source the World Bank (WB), however to contrast the data will be compared with national source like Statistical National Institute (INE) and Central Bank from Bolivia (BCB). To analyze the data, a thematic analysis approach will be employed using GRETL. To ensure the validity and reliability of the data, triangulation will be utilized, and ethical considerations will be taken into account. The limitations and challenges of the research methodology will also be acknowledged and discussed. The results of the thesis will be supported with tables, charts, and diagrams. The implications and recommendations will be discussed in the context of existing literature and policy debates, aiming to contribute to the field of fiscal policy evaluation.

2.2.1 Limitaion

The research will examine the impact of Bolivia's fiscal policy on its economic and social development applying the equation down below (1) and (2).

The economic model looks like this (Greene, W. H., 2008):

$$Y_{1t} = \beta_1 \pm \beta_2 X_{2t} \pm \beta_3 X_{3t} \pm \beta_4 X_{4t} \qquad (1)$$

Econometric Model (Greene, W. H., 2008):

$$Y_{1t} = \beta_1 \pm \beta_2 * X_{2t} \pm \beta_3 X_{3t} \pm \beta_4 X_{4t} + \varepsilon \qquad (2)$$

Dependent Variable:

Y_{1t} = GDP in current prices ($us in Billions)

Independent Variables:

X_{1t} = Intercept term

X_{2t} = Government revenue ($us in Billions)

X_{3t} = Government expenditure ($us in Billions)

X_{4t} = Final consumption expenditure ($us in Billions)

ε = Error term

The data will be collected in Billions of USD for Y_{1t} X_{2t} X_{3t} and X_{4t} variables in current prices.

The study will use data for ten years from 2013 to 2022.

2.2.2 Data

The data for this thesis will be obtained from the International Monetary Found (IMF) and World Bank (WB) Official Websites, the variables, description and the sources are enlisted in the Table 1.

Table 1: Data Description and Sources

Variables	Description	Source of data
Y_{1t}	GDP growth in current prices ($us in Billions)	International Monetary Fund (IMF)
X_{2t}	Government revenue ($us in Billions)	International Monetary Fund (IMF)
X_{3t}	Government expenditure ($us in Billions)	International Monetary Fund (IMF)
X_{4t}	Final consumption expenditure ($us in Billions)	World Bank (WB)

Source: Author

2.2.3 Model

This econometric model of fiscal policy is typically called a regression model, and the specific type of regression model used here is called ordinary least squares (OLSM) regression.

GDP = β0 ± β1 * government revenue ± β2 * government expenditure ± β3
Final consumption expenditure + ε

Where:

GDP = This represents the Gross Domestic Product, the total monetary value of final goods and services produced in Bolivia within a year. It is the dependent variable, the one being explained by the other factors in the model.

β0 = This is the intercept term. It shows how much GDP is expected to change (increase or decrease) if all the other variables would be zero.

β1 = This is the coefficient for government revenue. It shows how much GDP is expected to change with a unit change in government revenue (from taxes and other sources). A positive β1 suggests government revenue increases GDP, while a negative β1 might indicate crowding out effects, where government spending financed by high taxes reduces private investment.

Government revenue = This represents the total amount of money the Bolivian government collects through taxes and other sources. It is another independent variable.

β2 = This is the coefficient for government expenditure. It shows how much GDP is expected to change (increase or decrease) with a unit change in government expenditure. A positive β2 suggests government expenditure increases GDP, while a negative β2 indicates the opposite.

Government expenditure = This represents the total amount of money the Bolivian government spends on goods, services, and transfers. It is an independent variable, one of the factors believed to influence GDP.

β3 = This is the coefficient for final consumption prices. It shows how much GDP is expected to change with a unit change in consumption. A positive β3 suggests final consumption increases GDP, while a negative β3 indicates the opposite.

Final consumption expenditure = This variable represents the total spending by households and nonprofit institutions serving households (NPISH) on consumption goods and services. It's another independent variable believed to influence GDP.

ε = This represents the error term. It captures all the other factors that might influence GDP that are not explicitly included in the model.

3   Literature Review

Historical events in Bolivia

Here I enlisted the most important historical events that took place in Bolivia from 2013 to 2022:

- **2013**

Evo Morales, the first indigenous president of Bolivia, is re-elected for a third term in a landslide victory, winning over 60% of the vote (BBC News, 2014). This is seen as a strong endorsement of his policies, which focus on reducing poverty and increasing social spending. He was criticized and supported in equal measure for his leadership style and initiatives. While many Bolivians identified with his government's socialist goal of social justice, indigenous rights, and resistance to imperialism (Rivera, 2019), it also caused controversy and dissent among several socioeconomic groups.

Another historical event that happened this year was the Tupac Katari, a satellite launched from China into orbit, which was present for the event (BBC News, 2013). Due to the historical milestone, Bolivia has been among the countries with a device of these qualities to strengthen its communications system; in contrast, the opposition has disputed the genuine benefits that the satellite would offer. Others questioned the tool's potential impact on Bolivia's security and communications services oversight (Chacón, 2017).

- **2014**

With 61% of the vote, Evo Morales was reelected to a third term in 2014. The continuance of public investment plans and the promotion of domestic demand, the economic downturn brought on by declining commodity export prices, and the sharp decline in natural gas export volumes to Brazil and Argentina are the defining features of this current presidential term. (Smith, 2015)

Morales proposes a new constitution that would allow him to run for a fourth term in office. The constitution is approved by a referendum, but the opposition challenges the results in court (Garcia, 2018).

Positively, despite the backdrop of a regional economic recession and, generally speaking, a shaky global economy, 2014 has been another year in which the deployment

of the Productive Social Community Economic Model (MESCP), founded in 2006, has demonstrated excellent outcomes (Martinez, 2019). Bolivia therefore positioned itself as the nation with the greatest GDP growth (5.4%) in South America for the second time in a row, in 2009. (Perez, 2020)

- **2015**

The start of the 2015 administration was accompanied by a difficult economic environment, which included, among other things, the decline in the price of oil and other commodities, the weakening of neighboring economies, the devaluation of currencies throughout the region, and the slowdown of the Chinese economy (Smith, 2016). These factors gave neoliberal economic policy advocates ammunition to predict a dismal state of the nation's economy in 2015 and to argue that the government had not done enough to remedy the conditions that had prevailed in the preceding years (Jones & Johnson, 2017).

Bolivia had the greatest GDP growth rate in South America in 2015, with an astounding 4.8% growth rate (Garcia, 2018). The remarkable outcome can be ascribed to the reinvigoration of domestic demand, propelled by the measures undertaken by the MESCP since 2006 (Martinez, 2019). These measures encompassed regular salary increases that exceeded the rate of inflation and the introduction of focused social welfare schemes like the Renta Dignidad, the Juana Azurduy Bonus, and the Juancito Pinto Bonus (Sanchez & Rodriguez, 2017). However, the enormous amounts of public investment were the main force driving this economic recovery, which emerged as a pivotal engine propelling the economy forward (Gomez, 2020).

- **2016**

Bolivia held its 2016 constitutional referendum on February 21, of that year. This referendum was held to determine whether to approve or reject a proposed constitutional modification that would have allowed Álvaro García and Evo Morales, the state's president and vice president at the time, to compete for reelection. With 51.30% of the total votes, the "No" vote prevailed, while the remaining 48.70% of votes went to the "Yes" side (Martinez, 2021).

- **2017**

The Plurinational Constitutional Court ruled that Morales could not run for a fourth term due to term limits established in the 2009 constitution. However, the court later reverses its decision, clearing the way for Morales to participate in the 2019 election. This decision is highly controversial and leads to accusations that the judiciary is no longer independent (Smith, 2020).

The Bolivian Commission filed the national response in the maritime lawsuit against the neighboring country, filed at the International Court of Justice (ICJ) in The Hague, on March 21, amid strained relations between Chile and Bolivia over the detention of military personnel and officials of the National Customs Agency at a border. During an operation to capture suspected smugglers, the two military soldiers and seven representatives of the Bolivian National Customs Agency (ANB) were captured after they crossed the Bolivian border and entered Chilean territory (Garcia & Martinez, 2019).

- **2018**

The National Statistics Institute (INE) released official figures showing that the annual inflation rate was 1.5%, the lowest in the previous nine years and the second lowest in South America. The modest price fluctuations that were seen in 2018 made it easier to execute a monetary policy meant to boost the country's economy and are a sign of an economic policy that was applied successfully (Martinez & Garcia, 2019).

February 21, large-scale marches were held in Bolivia's major cities despite ongoing police brutality and intimidation. These marches were part of a nationwide civic strike called by civil society organizations against the policies of the Movement for Socialism (MAS), led by Juan Evo Morales Ayma, which aims to extend its rule (Sanchez et al., 2017).

By the other hand, The Hague, Netherlands-based International Court of Justice (ICJ) decided that Chile's government is not required to engage with Bolivia for the latter to enjoy sovereign access to the sea. "The Court, by 12 votes to 3, concludes that the Republic of Chile did not undertake an obligation to negotiate sovereign access to the sea for the Plurinational State of Bolivia," said Judge Abdulqawi Ahmed Yusuf, who read the verdict from the International Court of Justice (International Court of Justice, 2018).

- **2019**

In the first-ever primary elections, Evo Morales and eight other rival candidates declared their candidacies on January 28. The opposition, however, asserted that Morales' candidacy was just legitimated by the primaries.

After a few months, on October 20, the election day was marred by controversy due to the disruption of the vote count and allegations by the opposition that the vote trend was manipulated to support Evo Morales and avoid a rerun against opposition candidate and former president Carlos Mesa. Morales was able to justify his stance in the face of criticism (Vargas, 2019).

On November 1, amid a surge of social demonstrations and municipal strikes over electoral fraud, the Supreme Electoral Tribunal certified Evo Morales' first-round victory.

The Organization of American States (OAS) noted "serious" anomalies in the vote count in a preliminary assessment that was released ten days later. After 21 days of urban social protests known as the "pititas revolution," which were exacerbated by a police mutiny and the Armed Forces' "suggestion" that he step down from office, Evo Morales resigned from office a few hours later. For 13 years, 9 months, and 18 days, Morales ruled Bolivia Bryant, N. (2019).

Following a series of resignations from the constitutional succession, Jeanine Áñez, the second vice president of the Senate, appointed herself interim president on November 12 during a turbulent session of Parliament without a quorum. The shift received support from the Constitutional Tribunal. Evo Morales traveled to Mexico in search of safety. The president-elect condemned "a coup d'état." (BBC News, 2019).

A statute mandating fresh elections, originally set for May 3, was signed by President Áñez on November 24. Thirty-two individuals were killed in violent confrontations and anti-government protests between October 20 and November 27. The persecution by security forces claimed a great deal of life (BBC News, 2019).

On December 10, the municipality of Sacaba and the Alteño suburb of Senkata suffered massacre-like killings as a result of military actions, according to the Inter-American Commission on Human Rights (IACHR). Those who followed the previous president Morales were among the dead (Human Rights Watch, 2020).

- **2020**

The start of the year coincided with a political shift brought about by the resignation and subsequent exile of former President Evo Morales in November 2019. As Jeanine Áñez took over as temporary president, she had to navigate Bolivia's complicated political landscape while dealing with criticism and resistance from many sources (BBC News, 2019).

The COVID-19 epidemic made things much more difficult as Bolivia, along with many other nations, struggled to stop the virus's spread and control its effects on the nation's economic and public health. To stop the spread, the government imposed rigorous measures including lockdowns and travel bans, but the nation still had to deal with issues like a lack of medical supplies and a stretched hospital system (BBC News, 2019).

The fact that Evo Morales returned from exile in November after MAS candidate Luis Arce won the presidential election was one of the year's most significant events. With Morales's return, Bolivia's political environment appeared to be changing, and worries about the country's future under the new government were raised (CNN, 2020).

- **2021**

In 2021, Bolivia faced several political, social, and economic obstacles in addition to important events that altered the country's course.

The COVID-19 pandemic's effects were still being addressed at the start of the year. Notwithstanding distribution and logistical difficulties, the government carried out its immunization program. Despite obstacles including vaccine shortages and the introduction of new strains, the nation's efforts to control the virus remained a top priority Bolivia's economy was beset by long-term problems made worse by the epidemic, like as high unemployment and slow development. The administration worked to protect disadvantaged people and boost the economy, but structural problems including a reliance on commodity exports and a lack of diversification remained major concerns (World Health Organization, 2021).

Bolivia's economy grew 6.1% in 2021; this growth was attributed to the Strategic Plan to Combat COVID-19 and the reinstatement of the Social Community Productive Economic Model, which helped to establish the circumstances necessary for a gradual return to

economic normalcy. Because of the GDP growth that exceeded the predictions of international organizations and showed a notable comeback from 2020, the people of Bolivia felt more assured. This resulted in a macroeconomic stability scenario when paired with other factors (International Monetary Fund, 2021).

- **2022**

Bolivia's economy has been dealing with issues of budgetary sustainability and economic diversification. The government pursued programs to draw in international investment and advance sustainable development in addition to trying to support important industries including manufacturing, mining, and agriculture. Poverty and economic inequality continued to be major concerns on the government's agenda (World Bank, 2022).

In Bolivia's political sphere, disagreements and discussions on matters like human rights, democracy, and governance persisted. There remained friction between the opposition and the supporters of the ruling party due to continuous disagreements over the electoral procedures and accusations of corruption. Social justice and political change were heavily promoted by civil society groups and grassroots movements (The Guardian, 2022).

The October presidential and parliamentary elections were among the year's key events. Voters in Bolivia had the chance to select their leaders and determine the course of the nation during the elections. To guarantee fairness and transparency, the election process was extensively observed by both domestic and foreign observers (BBC News, 2022).

In other facts, the Bolivian government started to gain from its long-term efforts to industrialize lithium in 2022; these efforts were started under the administration of Morales. Bolivia is among the top 10 exporters of this metal this year, which is essential for the production of electrical devices. Bolivia currently has 21 million certified tons of lithium; however, this number might rise in the upcoming months as data from a study on salt flats close to Uyuni (in the Potosí department) becomes available. All of the present reserves are stored in these salt flats. The Plurinational State of Bolivia may add five million more tons from the Coipasa salt flat by 2023 (International Monetary Fund, 2022).

3.1 Fiscal Policy

It is important first to mention the basic definition of Fiscal Policy to understand the literature review.

a) Definition:

According to Blanchard, O., & Perotti, R., (2002), the use of taxes and expenditures by the government to affect the economy is known as fiscal policy. These are instruments that governments can utilize to accomplish a range of economic goals, including promoting economic growth, combatting inflation, reducing unemployment, and redistributing income.

b) Types of fiscal policy

Expansionary: This involves increasing government spending or decreasing taxes, to stimulate economic activity during periods of slow growth or recession (Mankiw, 2020).

Contractionary: This involves decreasing government spending or increasing taxes, to slow down inflation or reduce the government's budget deficit (Blanchard, Amighini, & Giavazzi, 2019).

3.1.1   Economic indicators

3.1.1.1 Definition

Economic indicators are statistical measures used to assess the health and performance of an economy (Board of Governors of the Federal Reserve System, 2023). They provide valuable insights into various aspects of an economy, including:

- **Growth:** Measuring how fast the economy is expanding (e.g., Gross Domestic Product (GDP) growth)
- **Stability:** Assessing the risk of inflation or fluctuations in economic activity (e.g., Consumer Price Index (CPI) and unemployment rate)
- **Efficiency:** Evaluating how resources are being used within the economy (e.g., trade balance and current account balance) (Board of Governors of the Federal Reserve System, 2023).

3.1.1.2 Types of Economics Indicators

There are several kinds of economic indicators, and each has a distinct function, however for this thesis, I will enlist the most representative indicators:

Leading indicators: These tend to forecast changes in the economy in the future. A few instances include manufacturing purchasing manager indices (PMIs), stock market performance, and consumer confidence (Board of Governors of the Federal Reserve System, 2023).

Coincidence indicators: At various stages of the economic cycle, these indicators fluctuate in tandem with the economy. Examples are retail sales, the GDP, and the unemployment rate (Board of Governors of the Federal Reserve System, 2023).

Lagging indicators: These show historical patterns in the economy and frequently respond more slowly to shifts. Inflation, debt levels, and the unemployment rate during a recession are a few examples (Board of Governors of the Federal Reserve System, 2023).

3.1.2   Gross Domestic Product (GDP)

3.1.2.1 Definition

Macroeconomics' central idea is the gross domestic product or GDP. It is the sum of all completed products and services produced inside the boundaries of a nation during a given period, generally a year, expressed in monetary or market value ([Organization for Economic Co-operation and Development (OECD), 2023]). This measure is essential to comprehending the total production capability and economic health of a country.

3.1.2.2 Classification of the Gross Domestic Product (GDP)

   1) **Production Approach (Value Added Approach)**

To determine the ultimate worth of goods and services, the Production Approach, also known as the Value Added Approach, computes the value contributed at each stage of production, effectively answering the question "What is the net contribution of each production stage?" (Blanchard, Amighini, & Giavazzi, 2019).

This method calculates GDP by adding up the value added at each step of production for all commodities and services in the economy (Mankiw, 2020).

   2) **Income Approach**

Compiling all of the revenue that the factors of production within an economy receive, the income method to GDP measurement offers a holistic perspective. Labor, land, capital, and entrepreneurship (McConnell, Brue, & Flynn, 2021) are commonly identified as these components. The basic question of how much is paid for the creation of products and services inside the economy is essentially what this method aims to address (Mankiw, 2021).

Acoording to Blanchard, Amighini, & Giavazzi, (2019), several aspects of income obtained inside the economy are covered by the income approach, including wages and salaries, rent, interest, and profits.

3) Expenditure Approach

According to Blanchard, O. J., Amighini, A., & Giavazzi, F. (2019), using this approach, the total costs of all goods and services produced domestically are calculated. "Who buys what is produced?" is fundamentally addressed. The formula and components are provided down below (3):

$$Y = C + I + G + (X - M) \tag{3}$$

In compliance with Mankiw, N. G. (2021), GDP (Y) is the sum of consumption (C), investment (I), government Expenditures (G), and net exports (X – M).

- **Consumption (C):** Spending by households on goods and services.
- **Investment (I):** Spending by businesses on new capital goods and inventories.
- **Government Spending (G):** Expenditure by the government on goods and services.
- **Net Exports (X-M):** The difference between a country's exports (goods and services sold abroad) and imports (goods and services purchased from abroad).

3.1.2.3 Types of GDP

1) Nominal GDP

Nominal GDP calculates the entire worth of all finished products and services produced inside the boundaries of a nation at current market prices for a given period, often a year or a quarter (Mankiw, 2020). It does not consider changes in price levels or inflation.

2) Real GDP

Real GDP provides a more accurate estimate of economic production across time by adjusting nominal GDP for changes in price levels. Using the prices of a base year as a point of reference, real GDP is computed by subtracting the impacts of inflation or deflation from nominal GDP (Blanchard et al., 2017).

3) GDP per capita

A nation's average economic production per person is estimated using GDP per capita, which is computed by dividing the nation's GDP by its population (Mankiw, 2014). Comparing the economic standing or living standards of other nations is a common usage for it.

4) Gross National Product (GNP)

As per Mankiw, (2014), The gross national product (GNP) is a measure of the total value of all finished products and services generated within a certain period by the citizens and enterprises of a nation, both domestically and internationally. GNP deducts revenue received by foreigners within the nation and adds money gained by domestic inhabitants from their foreign assets.

5) Gross National Income (GNI)

While taxes, subsidies, and depreciation are not included in GNI, it is comparable to GNP. Regardless of the source of income, it indicates the total amount earned by a nation's citizens and is frequently used to gauge economic performance (Blanchard et al., 2017).

6) Purchasing Power Parity (PPP) GDP

PPP GDP adjusts nominal GDP for differences in price levels between countries, allowing for more accurate comparisons of economic output and standards of living across countries. PPP accounts for differences in the cost of living and purchasing power of currencies (Hill & Hult, 2020).

3.1.3   Government Revenue

1)   Taxes:

The government receives the majority of its revenue from taxes. Two major groupings may be distinguished from them:

-       Direct taxes: These levy money directly from people's income or assets, including companies. Corporate profit tax (IUE in Spanish) and personal and corporate income tax are two examples (Bird & Zolt, 2005).

-       Indirect taxes: They are imposed on the use of products and services. The Financial Transactions Tax (ITF in Spanish) and Value Added Tax (VAT) are two examples (Keen & Lockwood, 2010).

2)   Fees and Duties:

The government collects required fees in exchange for the provision of certain services or the usage of public commodities. Customs charges, mining royalties, licenses, and permits are a few examples (Mehrotra & Thomas, 2020).

3)   Non-Tax Revenue:

This category includes additional revenue streams for the government, such as sales of products and services by publicly traded corporations, penalties, fines, interest received from investments made by the government, donations, and exchanges from other nations or internationally (Mishra, 2019).

3.1.4   Government Spending

The term "government spending" describes how much money the federal government spends on certain products, services, and transfers (Board of Governors of the Federal Reserve System, 2023). A mix of tax income, borrowing, and seigniorage (printing money) is used to pay for this expense.

3.1.4.1 Purpose and Impact

For society to function properly, governments are necessary to provide public goods and services including law enforcement, education, healthcare, infrastructure development, and national defense. To reduce economic disparity and assist underprivileged groups, governments also enact income redistribution policies through transfer payments like

social security, unemployment insurance, and welfare programs. In addition, governments use fiscal expansionary policies—that is, spending more money or lowering taxes—as a means of promoting economic development and lessening the negative effects of recessions on the economy.

By supporting aggregate demand, higher government expenditure can boost economic development and provide job opportunities. Unrestrained expenditure, meanwhile, might lead to inflation if productivity increases don't keep up. In addition, government spending on social welfare initiatives like healthcare and education is essential to improving people's overall well-being and developing a trained and healthy labor force, all of which promote long-term socioeconomic growth (World Bank, 2023). Furthermore, programs like targeted transfer payments and progressive taxes are crucial for reducing economic inequality and promoting higher social mobility in society (Stiglitz, 2012).

3.1.5 Final consumption expenditure

The total amount spent by households and nonprofit institutions serving households (NPISH) on consumption goods and services within an economy over a given period of time, usually a year, is known as final consumption expenditure (FCE), and it is a crucial component of GDP calculations. Food, clothes, housing, utilities, healthcare, education, transportation, leisure, and entertainment are just a few of the many things that fall under the broad category of FCE (Sekkat & Varoudakis, 2000). It is a crucial harbinger of national economic activity and consumer behavior.

The three primary components of FCE are services, nondurable commodities, and durable goods. While nondurable products like food and clothes are used relatively fast, durable goods like cars and appliances have a lifespan of more than a year (Mankiw, 2014). Services comprise a broad spectrum of intangible advantages and activities offered to customers, such as personal services, healthcare, education, transportation, and communication (Kotlikoff & Summers, 1981).

FCE is influenced by both imports and domestic output. Goods and services produced domestically are those that are brought into the nation from outside, whereas imports are those that are acquired from other nations. To guarantee that only the value of final

consumption created locally is included in the GDP calculation, imports are deducted from FCE (Hill & Griffiths, 2008).

All things considered, FCE offers insightful information on consumer behavior, tastes, and the state of the economy inside a country. FCE levels are a crucial measure for economists and policymakers because they can reveal changes in consumer confidence, economic circumstances, and overall economic growth (Mishkin, 2015).

3.2 Monetary Policy

3.2.1 Definition

The measures done by a central bank, such as the European Central Bank (ECB) or the US Federal Reserve, to affect the money supply and credit conditions in the economy are referred to as monetary policy. These acts seek to accomplish particular financial objectives such as:

- Price stability: Keeping inflation under control and preventing excessive price fluctuations.
- Economic growth: Stimulating economic activity and employment.
- Financial stability: Mitigating the risks of financial crises.

In agreement with Mishkin, F. S., (2018), reserve requirements are another important weapon in the central bank's toolbox. They specify the minimum percentage of deposits that banks must retain in reserve. Central banks have direct control over the lending capacity of commercial banks through the modification of these reserve requirements. Reserve requirements force banks to retain a greater percentage of their deposits as reserves, which lowers the money supply and limits the amount of money available for lending. On the other hand, decreasing reserve requirements increases the amount of money available for lending.

In accordance with Cecchetti, S. G., & Schoenholtz, K. L., (2018), the discount rate, or the interest rate at which commercial banks can borrow reserves from the central bank, is another tool that central banks employ. Commercial banks' ability to borrow money can be encouraged or discouraged by changing the discount rate. By encouraging banks to borrow more reserves from the central bank, the discount rate is lowered, which expands

the money supply and boosts economic activity. On the other hand, increasing the discount rate makes banks less likely to borrow, which lowers the amount of money in circulation and may lessen inflationary pressures.

3.2.2 Types of Monetary Policy

➢ Expansionary Policy

One important weapon that central banks use to fight recessions and downturns in the economy is expansionary monetary policy, which increases growth and stimulates the economy. With the help of this policy approach, the economy will be encouraged to spend, invest, and lend money by enacting many policies that will raise the money supply and lower borrowing costs.

Adding liquidity to the financial system through Open Market Operations (OMOs) is a vital aspect of expansionary monetary policy. When central banks purchase government assets on the open market, they effectively boost the money supply and increase bank reserves. The primary objective of open market operations (OMOs) is to infuse liquidity into the banking system, thereby reducing interest rates. This reduction in interest rates stimulates borrowing and investment by consumers and companies (Romer & Romer, 2004).

➢ Contractionary Policy

The other important tool that central banks have to fight inflationary pressures and reduce the possibility of asset bubbles in the economy is contractionary monetary policy. Using this policy approach, lending, investment, and spending activities are suppressed by enacting policies that lower the money supply and raise borrowing rates.

Using Open Market Operations (OMOs) to remove liquidity from the financial system is a key tactic used in contractionary policy (Leeper, 1991). By selling government assets on the open market, central banks can lower bank reserves and the money supply. Central banks seek to boost interest rates by decreasing the amount of money available in the banking system through OMOs, discouraging individuals and companies from borrowing and investing.

4   Practical Part

4.2   Data definition

4.2.1   Bolivia's Gross Domestic Product (GDP)

In order to analyze the Bolivia's GDP is important firstly to see the growth itself year by year in this period (2013-2022) shown below in the Table 2.

Table 2: Bolivia GDP Growth (Annual %)

Year	GDP growth (annual %)
2013	6.80
2014	5.46
2015	4.86
2016	4.26
2017	4.20
2018	4.22
2019	2.22
2020	-8.74
2021	6.11
2022	3.61

Source: World Bank Database

As we can see in the Graph 1, there was a break point during 2020 in the Bolivia's GDP growth, mainly due to Covid 19 and the transitional government.

Graph 1: Bolivia's GDP growth from 2013 - 2022

Source: Own calculation based on World Bank indicators

Bolivia's economy is segmented according to a variety of industries, each of which contributes to the country's total production. Among the main foundations is the services industry, which includes travel, banking, transportation, and professional services, among other things. Driven by internal demand and maybe some degree of foreign commerce, this sector probably makes up a sizable percentage of Bolivia's economic activity.

Bolivia's economy is mostly dependent on agriculture since the nation is well-known for producing items related to agriculture. Products like soybeans, quinoa, and coca leaves are examples of potential exports; the sustainability of any export is determined by legal frameworks and consumer demand. For many Bolivians, especially those living in rural regions, agriculture is a major source of work and income.

Although its size and importance might fluctuate, the industrial sector also plays a role in Bolivia's economic environment. The mining and energy production businesses, as well as other resource extraction sectors, are included in the industrial sector. The amount of infrastructure investment, the availability of raw resources, and government initiatives to support industrial development all influence how much the industrial sector contributes.

To see the participation of the Bolivia Value added by economic activity down below, the Table 3 shows the gross value added at current prices according to economic activity from 2022 in national currency.

Table 3: Bolivia Gross Value Added Structure (In thousands of Bolivians)

ECONOMIC ACTIVITY	2022(p)	%
GROSS VALUE ADDED (at basic prices)	255,825,495	100
PUBLIC ADMINISTRATION SERVICES	52,284,378	20.4%
TRANSPORTATION AND STORAGE	24,533,078	9.6%
METALLIC AND NON-METALLIC MINERALS	22,021,813	8.6%
TRADE	21,863,911	8.5%
NON-INDUSTRIAL AGRICULTURAL PRODUCTS	19,502,120	7.6%
FINANCIAL SERVICES	14,566,989	5.7%
CRUDE OIL AND NATURAL GAS	11,191,015	4.4%
COMMUNAL, SOCIAL AND PERSONAL SERVICES	10,765,249	4.2%
HOMEOWNERSHIP	9,009,281	3.5%
CONSTRUCTION AND PUBLIC WORKS	8,249,794	3.2%
LIVESTOCK PRODUCTS	8,167,454	3.2%
RESTAURANTS AND HOTELS	6,967,800	2.7%
ELECTRICITY, GAS AND WATER	6,939,613	2.7%
INDUSTRIAL AGRICULTURAL PRODUCTS	6,859,715	2.7%
BUSINESS SERVICES	6,311,738	2.5%
MISCELLANEOUS FOOD PRODUCTS	4,729,317	1.8%
FRESH AND PROCESSED MEATS	4,547,639	1.8%

BEVERAGES	4,341,342	1.7%
NON-METALLIC MINERAL PRODUCTS	4,121,261	1.6%
COMMUNICATIONS	2,901,845	1.1%
PETROLEUM REFINING PRODUCTS	2,477,388	1.0%
MILLING AND BAKERY PRODUCTS	2,224,770	0.9%
FORESTRY, HUNTING AND FISHING	2,128,077	0.8%
SUBSTANCES AND CHEMICALS	1,764,239	0.7%
TEXTILES, FABRICS, CLOTHING AND LEATHER PRODUCTS	1,751,573	0.7%
DOMESTIC SERVICES	1,637,669	0.6%
WOOD AND WOOD PRODUCTS	1,425,346	0.6%
DAIRY PRODUCTS	1,410,178	0.6%
COCA	1,259,685	0.5%
SUGAR AND CONFECTIONERY	908,532	0.4%
PAPER AND PAPER PRODUCTS	715,394	0.3%
MISCELLANEOUS MANUFACTURED PRODUCTS	392,520	0.2%
COMMODITY METAL PRODUCTS	171,826	0.1%
PROCESSED TOBACCO	168,218	0.1%
METAL PRODUCTS, MACHINERY AND EQUIPMENT	127,047	0.0%
Imputed Banking Services	-12,612,317	-4.9%

Source: Bolivia National Institute of Statistics (INE)

In the Graph 2, it can be seen that the public administration services have the 20 % of the total, with 45 % It is gathered the remaining sectors.

Graph 2: Bolivia Gross Value-Added Structure
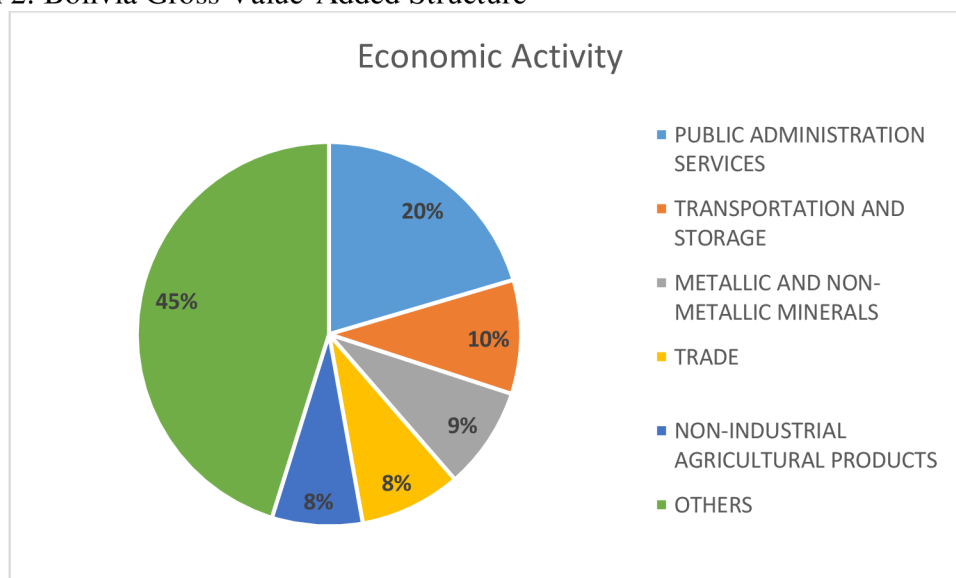
Source: Own calculation based on Bolivia National Institute of Statistics (INE)

It is also important to reflect in this thesis, the GDP growth of South America reflected in the Table 4, to compare how the Bolivian economy was growing year by year and compare that growth with all the countries in the region.

Table 4: South America GDP Growth (Annual %)

Year	Argentina	Bolivia	Brazil	Chile	Colombia	Ecuador	Peru	Paraguay	Uruguay
2013	2.41	6.80	3.00	3.31	5.13	4.95	5.85	8.29	4.64
2014	-2.51	5.46	0.50	1.79	4.50	3.79	2.38	5.30	3.24
2015	2.73	4.86	-3.55	2.15	2.96	0.10	3.25	2.96	0.37
2016	-2.08	4.26	-3.28	1.75	2.09	-1.23	3.95	4.27	1.69
2017	2.82	4.20	1.32	1.36	1.36	2.37	2.52	4.81	1.74
2018	-2.62	4.22	1.78	3.99	2.56	1.29	3.97	3.20	0.16
2019	-2.00	2.22	1.22	0.74	3.19	0.01	2.24	-0.40	0.74
2020	-9.90	-8.74	-3.28	-6.15	-7.25	-7.79	-10.87	-0.82	-6.26
2021	10.72	6.11	4.99	11.74	11.02	4.24	13.42	4.02	5.28
2022	4.96	3.61	2.90	2.44	7.26	2.95	2.68	0.08	4.92

Source: International Monetary Fund (IMF)

* Venezuela was excluded from the chart because there is no information in the
Database.

Bolivia received a gold medal for the highest economic growth in the region by the
International Monetary Fund (IMF) in 2014, 2015, and 2018, to observe these indicators
the author of this thesis made the Graphs 3, 4, and 5 to illustrate better.

Graph 3: South America GDP Growth 2014 (Annual %)
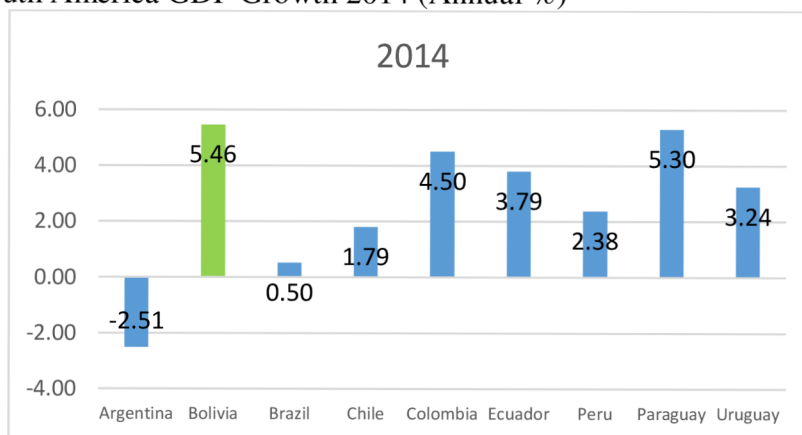
Source: Own calculation based on International Monetary Fund (IMF)

Graph 4: South America GDP Growth 2015 (Annual %)

2015

	Argentina	Bolivia	Brazil	Chile	Colombia	Ecuador	Peru	Paraguay	Uruguay
Value	2.73	4.86	-3.55	2.15	2.96	0.10	3.25	2.96	0.37
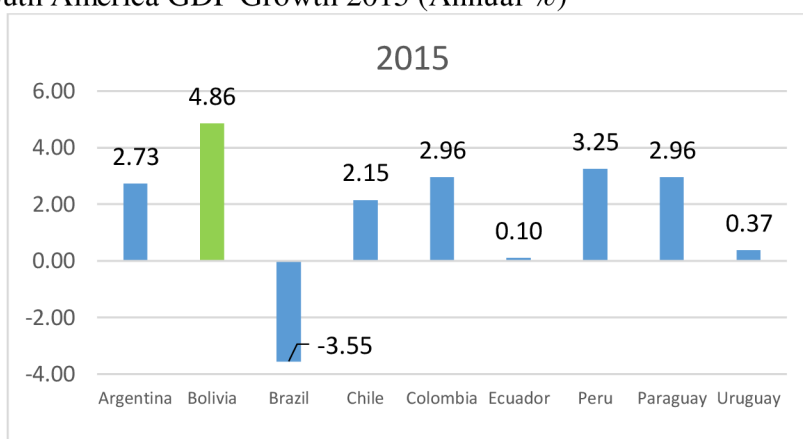
Source: Own calculation based on International Monetary Fund (IMF)

Graph 5: South America GDP Growth 2015 (Annual %)

2018

	Argentina	Bolivia	Brazil	Chile	Colombia	Ecuador	Peru	Paraguay	Uruguay
Value	-2.62	4.22	1.78	3.99	2.56	1.29	3.97	3.20	0.16
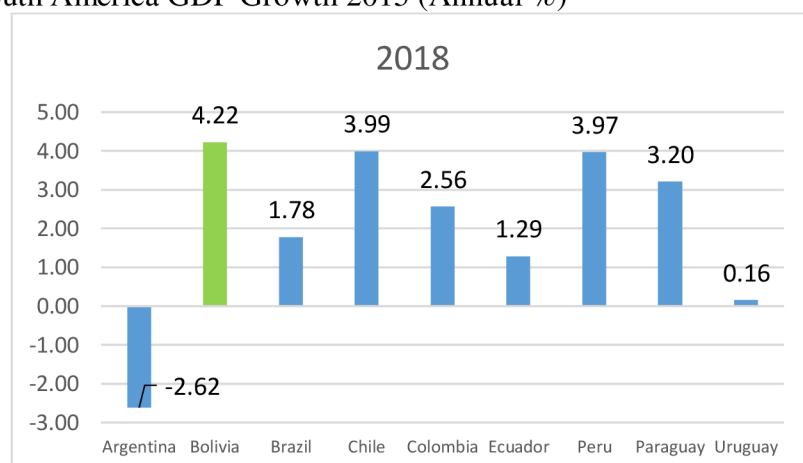
Source: Own calculation based on International Monetary Fund (IMF)

Bolivia's Gross Domestic Product (GDP) for the years 2013 to 2022 is shown in the table 5, with GDP expressed in billions of US dollars at current prices. In essence, GDP measures the total monetary worth of all products and services produced inside the boundaries of a nation during a certain time period.

Table 5: Bolivia's Gross domestic product, current prices

Year	Bolivia's Gross domestic product, current prices (in billion USD)
2013	30.88
2014	33.24
2015	33.24
2016	34.19

2017	37.78
2018	40.58
2019	41.19
2020	36.90
2021	40.70
2022	43.43

Source: International Monetary Fund (IMF)

Graph 6: Bolivia GDP from 2013 – 2022
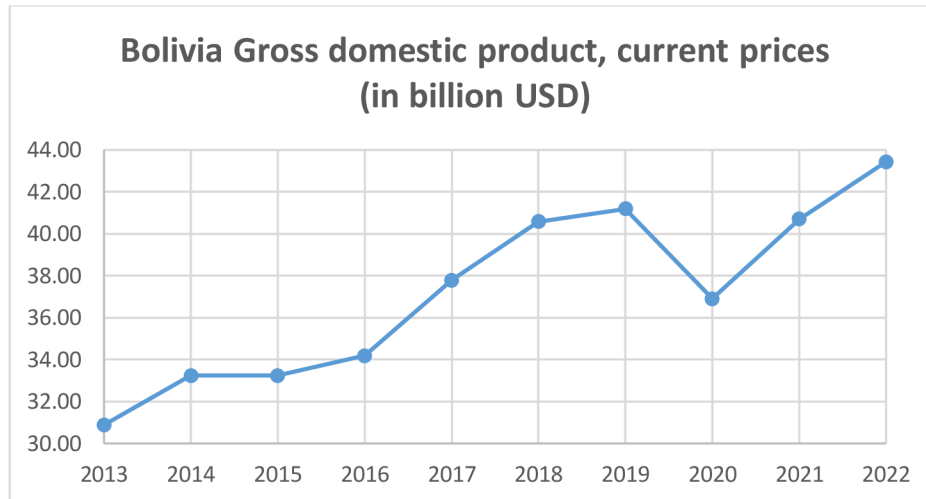
Source: Own calculation based on International Monetary Fund indicators (IMF)

The Graph 6 shows that there was a significant decline in 2020, coming in at $36.90 billion USD. Numerous variables, including foreign shocks, economic difficulties, or domestic policies impacting the nation's economic performance, might be responsible for this drop. Bolivia's GDP increased in 2021 to $40.70 billion USD despite this setback, indicating resilience and prospects for recovery.

In 2022, the increasing trend continued, and Bolivia's GDP reached $43.43 billion USD. This was a positive indicator of economic expansion and stability, showing Bolivia's capacity to overcome obstacles and seize chances for success. All things considered, the data offers insightful information on Bolivia's economic performance throughout the given time frame, illustrating patterns of expansion, stability, and volatility in its GDP.

4.2.2   Bolivian Government Revenue

It is essential to comprehend the nature of Bolivia's government's revenue to analyze the public finances of the nation. The primary revenue streams are broken out as follows:

4.2.2.1 Taxation Structure

Is important to highlight the Bolivian Tax revenue by each economic sector described in the Table 6:

Table 6: Bolivian Tax Revenue by Economic Activity (Million USD)

Economic activity	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Agriculture, forestry, hunting and fishing	35	46	47	42	44	49	46	41	51	52
Crude oil and natural gas	2,828	3,063	2,454	1,471	1,515	1,771	1,427	1,232	1,226	1,320
Metallic and non-metallic minerals	159	152	138	245	210	232	360	66	191	427
Manufacturing industry	648	636	697	744	682	721	665	557	610	657
Electricity, gas, and water	113	124	133	139	150	173	192	166	191	169
Construction	165	222	280	302	296	271	253	128	184	199
Trade	650	748	840	858	829	818	809	693	811	857
Transport and comunication	431	439	529	513	509	540	523	422	405	437
Financial, insurance, real estate and services	312	355	384	315	403	457	451	486	488	503
Public administration services	110	118	188	179	169	160	154	144	155	165
Other services	395	519	604	646	635	637	658	455	564	662
Total	**5,845**	**6,422**	**6,294**	**5,455**	**5,442**	**5,829**	**5,541**	**4,391**	**4,876**	**5,448**

Source: Bolivian National Tax Service (SIN).

Graph 7: Bolivian Tax Revenue by Economic Activity (2022)
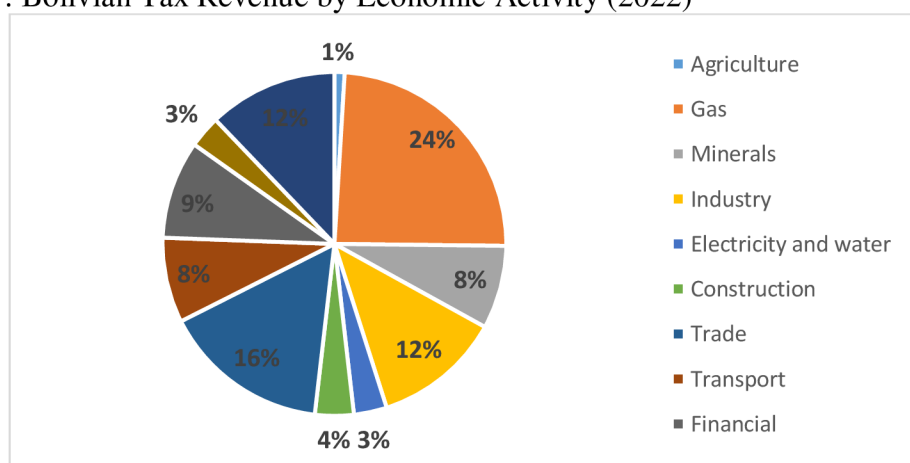
Source: Own calculation based on Bolivian National Tax Service (SIN).

The Gas sector has the highest percentage contributing the government taxation as we could see in the Graph 7.

Bolivia's taxation structure is a combination of direct and indirect taxes enlisted in the Table 7. Here is a breakdown of the key components:

Table 7: Bolivian Taxation Structure

No	Domain	Tax	Acronym	Rate	Tax Type
1	National	Value Added Tax	VAT	13.0%	Indirect
2	National	Transaction Tax	TT	3.0%	Direct
3	National	Corporate Income Tax	CIT	25.0%	Direct
4	National	Complementary VAT Regime	RC-VAT	13.0%	Direct
5	National	Special Tax on Hydrocarbons and their Derivatives	STUD	Rates per Lt	Indirect
6	National	Tax on Air Departures Abroad	TADA	Updated rates	Direct
7	National	Financial Transaction Tax	FTT	0.3%	Direct
8	National	Specific Consumption Tax	SCT	Specific rate	Indirect
9	National	Direct Tax on Hydrocarbons	DTH	32.0%	Direct
10	National	Tax on Participation in Games	TPG	15.0%	Direct
11	National	Gaming Tax	GT	10-30%	Direct
12	National	Tax on Large Fortunes	TLF	1.4-2.4%	Direct
13	Departmental	Departmental Tax on the Free Transfer of Assets	DTFTA	1-20%	Direct
14	Municipal	Municipal Transfer Tax	MTT		-
15	Municipal	Real Estate Property Tax	REPT		-
16	Municipal	Motor Vehicle Property Tax	MVPT		-

Source: Banco Central de Bolivia (BCB)

The Bolivian taxation structure is divided into three categories according to the type of tax:

- National
- Departamental
- Municipal

4.2.2.2 Type of Taxes

- **Direct Taxes:**

Corporate Income Tax (CIT): All companies in Bolivia are subject to a flat rate of 25% on their net profits (PwC, 2023).

Personal Income Tax (PIT): Individuals are taxed on their Bolivian-source income at a progressive rate. The rate starts at 13% and can reach 20% for higher-income earners

(PwC, 2023). This is different from the United States where individuals are taxed on their worldwide income regardless of the source.

Inheritance Tax: Inherited assets are taxed at a rate ranging from 1% to 20%, depending on the value and the relationship between the deceased and the beneficiary (CISA Trust, 2023).

Gift Tax: Similar to inheritance tax, gifts are also taxed on a progressive scale, ranging from 1% to 20% (CISA Trust, 2023).

Indirect Taxes:

Value Added Tax (VAT): This is the most significant indirect tax in Bolivia, levied on the sale of movable goods and provision of services at a standard rate of 13% (PwC, 2023). The final price consumers pay includes this tax.

Transaction Tax: A tax on gross income arising from any economic or commercial activity, including non-profitable activities. However, there are exceptions for certain transactions such as the sale of investments and the sale of minerals (PwC, 2023). The rate is 3% and is applied monthly.

Other Indirect Taxes: Additional taxes exist on specific goods and services, such as special taxes on hydrocarbons, alcoholic beverages, and tobacco products.

Part of the amount of all this taxes represent the Bolivia's tax revenue shown in the table 8.

Table 8: Bolivian Tax Revenue

Year	Tax Revenue (current prices in Million USD)
2013	5,845
2014	6,422
2015	6,294
2016	5,455
2017	5,442
2018	5,829
2019	5,541
2020	4,391

2021	4,876
2022	5,448

Source: World Bank Database

In the Graph 8 there is a representation illustrating the trend and distribution of tax revenue in Bolivia over the past decade.

Graph 8: Bolivia Tax Revenue from 2013 – 2022
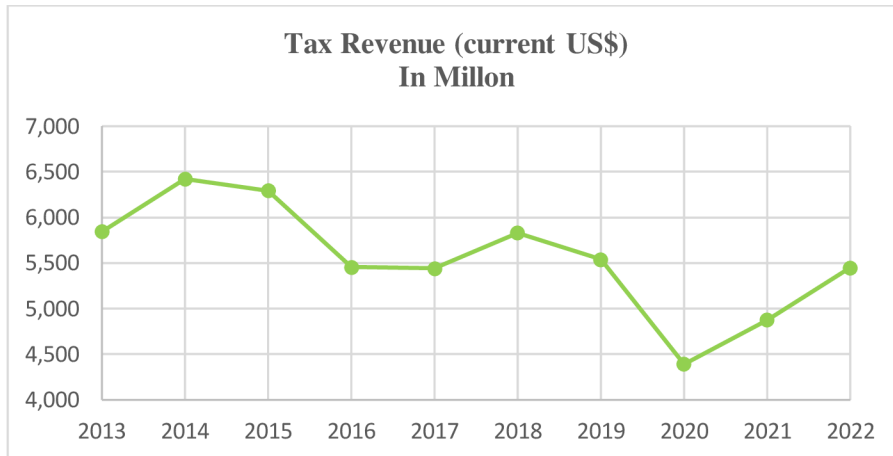
Source: Own calculation based on World Bank statistics

Here in the Table 9 we can notice the highest value was in 2014 with a total revenue of 13.26 Billions of USD, and the lowest value was in 2020 with 9.32 billion of USD.

Table 9: Bolivia Government Revenue

Year	Bolivia General government revenue (in billion USD)
2013	12.07
2014	13.26
2015	12.53
2016	11.17
2017	11.63
2018	11.75
2019	11.88
2020	9.32
2021	10.20
2022	11.58

Source: International Monetary Fund (IMF)

In the Graph 9, down below we can notice these mentioned point, where from 2016 to 2019 the government revenue has manteined in the same range of revenue, in other words was stable

Graph 9: Bolivia Government Revenue
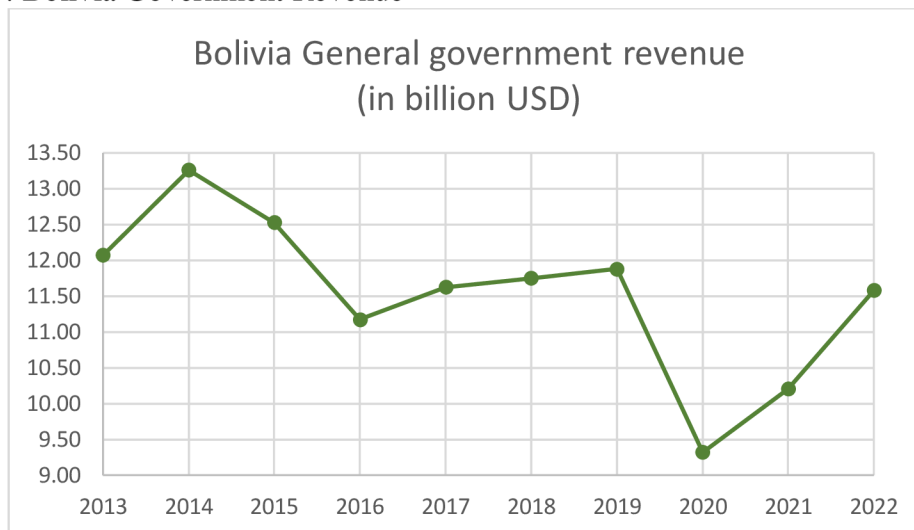
Source: Own calculation based on International Monetary Fund indicators (IMF)

4.2.3   Bolivian Government Expenditure

In the Table 10 is a breakdown of government spending in Bolivia categorized by two expenditure areas.

Table 10: Government Spending by Category

Category	Description
Central Government Spending	Represents expenditures managed by the national government. E.g.: Ministries (Defense, Education, Health), National infrastructure projects, Social programs.
Decentralized Spending	Budget allocations are distributed to lower levels of government. E.g.: Departments: Allocated funds for regional projects and services.

Source: Ministry of Economy and Public Finance (Bolivia)

Reflected in the Table 11, is detailed how the Bolivian government allocates its spending across different sectors.

Table 11: Government Spending by Sector

Sector	Description	Institutions
Social Sector	Expenditures aimed at improving social well-being.	Education: Public schools, universities, educational programs. Health: Public hospitals, clinics, health programs. Social Protection: Cash transfers, fuel and food subsidies, pensions.
Infrastructure	Investments in physical infrastructure.	Transportation: Roads, bridges, airports, ports. Energy: Electricity generation, transmission, and distribution. Telecommunications: Development of communication infrastructure.
Economic Development	Supports economic growth and diversification.	Agriculture: Support for farmers, rural development programs. Industry: Targeted industrial development programs.
Public Administration	Covers government operational costs.	Salaries for public sector workers. Administrative expenses (buildings, equipment, services).
Debt Service	Payments on loans taken by the government.	Interest payments and principal repayments on external and internal debt.

Source: Ministry of Economy and Public Finance (Bolivia)

The following table 12 shows the composition of the government spending structure handled over the last 10 years.

Table 12: Bolivian Government Spending Structure

Non-Financial Public Sector					
General Government				Public enterprises	
Central Government	Prefectures	Municipalities	Social Security	National Companies	Water Companies
General treasury of the nation (TGN)	La Paz		National Health Fund	YPFB	SELA
Investment Funds	Chuquisaca		Oil Health Fund	COMIBOL	SEMAPA
National Road Service	Cochabamba		Institute of Security Social	VINTO	ELAPAS
Rest Central Government	Oruro			ENDE	

Social Programs	Potosí			ENFE	
	Tarija			AASANA	
	Santa Cruz				
	Beni				
	Pando				

Source: Unidad de Programación Fiscal (UPF)

In the face of these developments, government expenditure as a percentage of GDP experienced a significant increase throughout the period under review. The budget's content may also vary depending on the administration in power and its policy agenda. Because they relied on volatile commodity prices and rising debt levels, these expansive spending programs have raised questions about their long-term viability (IMF, 2022). Furthermore, reflecting underlying socioeconomic inequities, the distribution of wealth and resource revenue developed as a major political topic of dispute (CEPAL, 2014). Additionally, a reassessment of expenditure priorities may have been driven by the political crisis of 2019 and the ensuing changes in administration, which might signal future changes in the political environment (IMF, 2022).

In the table 13, the highest value was in 2022 with a total government expenditure of 15.27 Billions of USD, and the lowest value was in 2013 with 11.87 billions of USD.

Table 13: Bolivia Government Expenditure

Year	Bolivia General government total expenditure (in billion USD)
2013	11.87
2014	14.38
2015	14.82
2016	13.65
2017	14.58
2018	15.05
2019	14.86
2020	14.01
2021	14.00
2022	15.27

Source: International Monetary Fund (IMF)

In the graph 10 it is notorious how the Bolivian government increased its spending significantly between 2013 and 2022, mostly focusing on investments in a few important areas. Among these were noteworthy infrastructure projects to promote economic development efforts and improve connectivity, such as highways, airports, and telecommunications (CEPAL, 2014).

Graph 10: Bolivia Government Expenditure
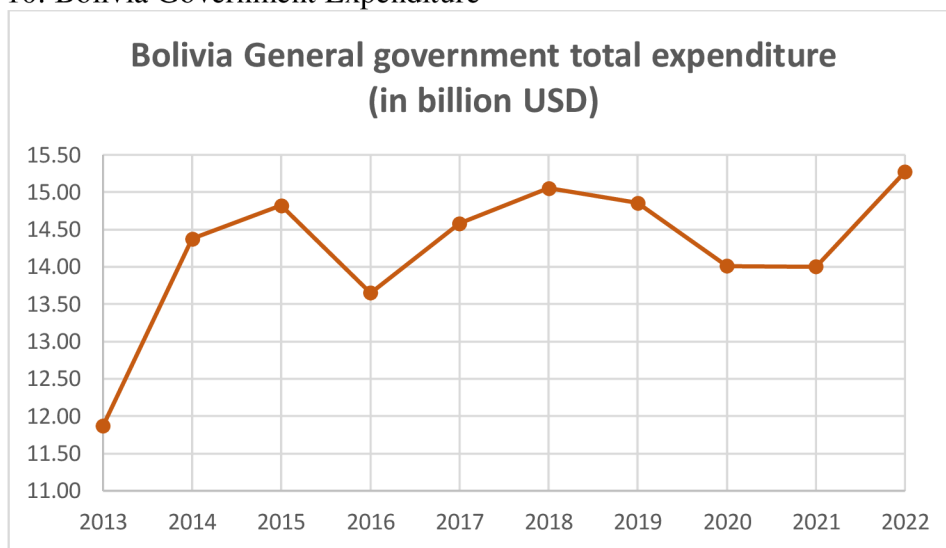
Source: Own calculation based on International Monetary Fund indicators (IMF)

4.2.4   Bolivia Final Consumption Expenditure

The table 14 presents the final consumption expenditure in Billions USD from 2013 to 2022, year by year we can notice there is a slightly increase in the consumption, nevertheless in 2020 there was a breakpoint, that is attributed to the Covid 19 and the transitional government due to the coup.

Table 14: Bolivia Final Consumption Expenditure

Year	Final consumption expenditure (in Billions USD)
2013	22.70
2014	25.62
2015	28.35
2016	29.31
2017	31.76
2018	34.06

2019	35.41
2020	32.67
2021	34.98
2022	37.81

Source: World Bank (WB)

The graph 11 illustrates the FCE trends, where overall was steady between 2013 - 2022.

Graph 11: Final Consumption Expenditure

Final consumption expenditure (in Billions USD)
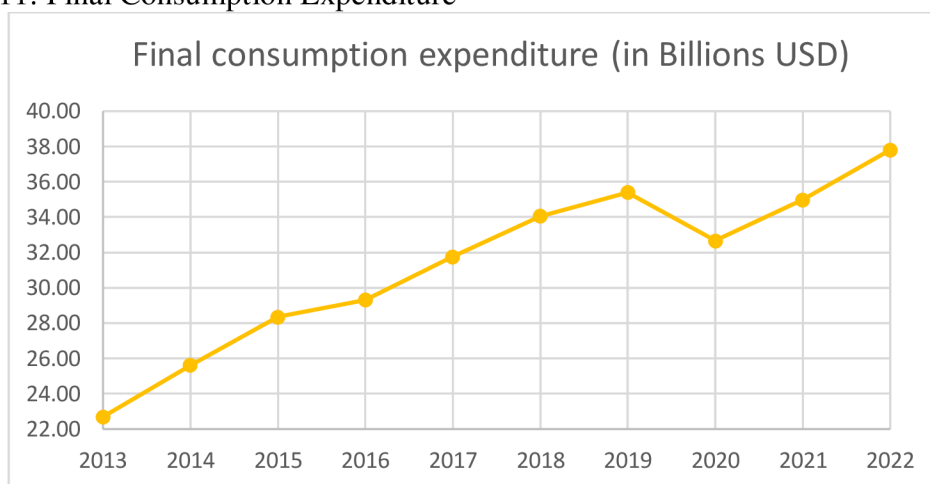
Source: Own calculation based on World Bank (WB

It is also important to show the percentage of the Final consumption regarding the GDP, thus the GDP is influenced by the FCE, in the table 15 is reflected this participation.

Table 15: Final consumption expenditure (% of GDP)

Year	Bolivia GDP (in Billions USD)	Final consumption expenditure (% of GDP)
2013	30.88	74.03
2014	33.24	77.64
2015	33.24	85.91
2016	34.19	86.37
2017	37.78	84.68
2018	40.58	84.54
2019	41.19	86.59
2020	36.90	89.18
2021	40.70	86.58
2022	43.43	85.92

Source: World Bank (WB)

High levels of FCE could reflect strong consumer confidence and spending, which may be indicative of a healthy economy. However, if consumers are overspending and

accumulating debt to sustain consumption levels, it could lead to financial instability in the long term.

4.2.5   Bolivian Monetary Policy

Throughout the study period, Bolivia adhered to a fixed exchange rate regime, fixing the Boliviano (BOB) at a rate of 1 USD = 6.91 BOB to the US Dollar (USD) (Central Bank of Bolivia [BCB], n.d.). Within this framework, the Central Bank of Bolivia (BCB) employed net domestic credit (NDC) growth as its principal tool for operational monetary policy, to manage the money supply in the economy to indirectly manage inflation (IMF, 2022).

The BCB's capacity to unilaterally modify interest rates in reaction to economic conditions was restricted by the fixed exchange rate regime (Table 11), which made it harder for it to successfully battle inflation or changes in the economy. Bolivia's export revenues and foreign exchange reserves are impacted by changes in global commodity prices, primarily those of oil and gas. These variables have a considerable impact on the country's monetary policy. For most of the era, inflation exceeded the central bank's target range even while Net Domestic Credit "NDC" growth was the goal.

Table 16: Bolivian Monetary Policy

Year	Exchange Rate Regime	Target Monetary Policy Tool	Inflation Rate
2013	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~5.2%
2014	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~4.8%
2015	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~5.9%
2016	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~4.2%
2017	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~2.7%
2018	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~4.0%

2019	Temporary Flexibility	Net Domestic Credit (NDC) Growth	~8.6%
2020	Reverted to Fixed	Net Domestic Credit (NDC) Growth	~0.6%
2021	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~3.2%
2022	Fixed (1 USD = 6.91 BOB)	Net Domestic Credit (NDC) Growth	~3.1%

Source: Banco Central de Bolivia (BCB)

4.2.5.1 Inflation average consumer prices

The monetary policy is very important for the stability of the country's economy, for that reason is important to analyze the inflation in terms of the rate which general level of prices for good and services, the table 15 is showing the inflation over the past 10 years of Bolivia from 2013 to 2022.

Table 17: Bolivia Inflation, average consumer prices (In percent %)

Year	Bolivia Inflation, average consumer prices (%)
2013	5.74
2014	5.77
2015	4.06
2016	3.63
2017	2.82
2018	2.27
2019	1.84
2020	0.94
2021	0.74
2022	3.19

Source: International Monetary Fund (IMF)

The graph 11 reflects an interesting decrease from 2013 which was 5.74 % and went decreasing till 2021 where had the lowest value with 0.74 %. In 2022 the Inflation increase reaching 3.19 %.

Graph 12: Bolivia Inflation, average consumer prices (In percent %)

Bolivia Inflation, average consumer prices (%)
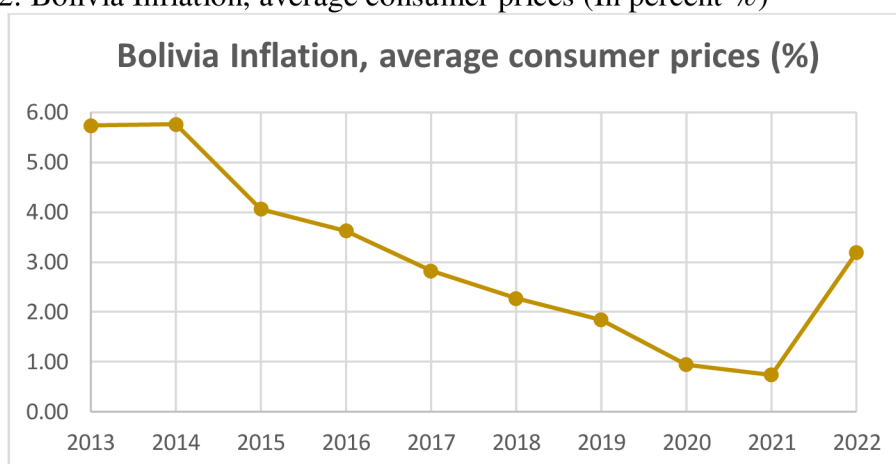
Source: Own calculation based on International Monetary Fund (IMF)

It is also important to reflect in this thesis the inflation rates of South America to compare the Bolivian inflation performance year by year with the South American countries.

The table 16, shows all the inflation rates per country, where Argentina and Venezuela show high values of inflation during this period.

Table 18: South American Inflation, average consumer prices (In percent %)

Year	Argentina	Venezuela	Bolivia	Brazil	Chile	Colombia	Ecuador	Paraguay	Peru	Uruguay
2013	10.62	40.64	5.74	6.20	1.79	2.02	2.72	2.66	2.81	8.58
2014	n/a	62.17	5.77	6.33	4.71	2.91	3.59	5.03	3.25	8.88
2015	n/a	121.74	4.06	9.03	4.35	4.99	3.97	3.13	3.55	8.67
2016	n/a	254.95	3.63	8.74	3.79	7.51	1.73	4.08	3.59	9.64
2017	25.68	438.12	2.82	3.45	2.18	4.31	0.42	3.61	2.80	6.22
2018	34.28	65,374.08	2.27	3.67	2.32	3.24	-0.22	3.97	1.32	7.61
2019	53.55	19,906.02	1.84	3.73	2.25	3.52	0.27	2.76	2.14	7.88
2020	42.02	2,355.15	0.94	3.21	3.04	2.52	-0.34	1.77	1.83	9.76
2021	48.41	1,588.51	0.74	8.30	4.52	3.50	0.13	4.79	3.98	7.75
2022	72.37	210.00	3.19	9.41	11.63	9.75	3.21	9.48	7.46	9.11

Source: International Monetary Fund (IMF)

Graph 13: South American Inflation, average consumer prices (In percent %)

South America Inflation rates (%)
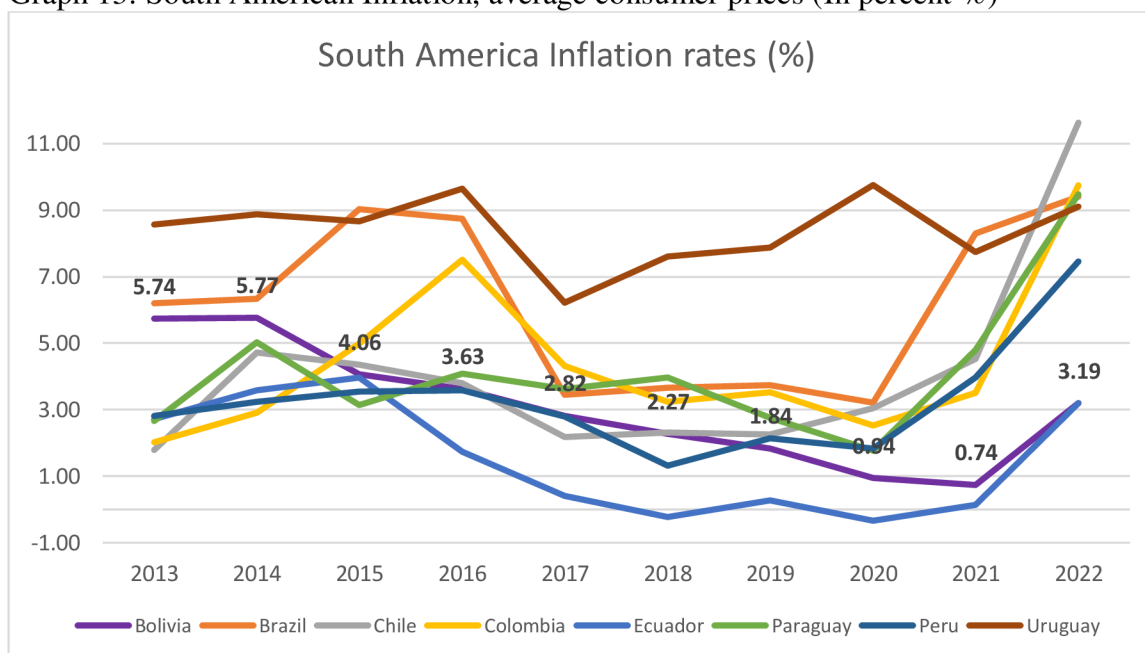
Source: Own calculation based on International Monetary Fund (IMF)

In the graphic 13, that was not considered Venezuela either Argentina due to high inflationary rates that could affect the scales of the graphic, for that reason I have decided to put them apart from it, for the other side from this period Uruguay is having high inflationary issues.

A healthy inflation is generally considered to be in a moderate range, where prices increase at a steady but controlled pace. There is not a universally accepted specific range for healthy inflation, as it can vary depending on economic conditions and monetary policies in each country. However, in many cases, an annual inflation rate in the range of 2% to 3% is considered desirable for economic stability. This range allows for sustainable and predictable economic growth, without the risks associated with inflation being too low (such as deflation) or too high (such as hyperinflation).

4.3   Data Validation

In order to organize the data, the table 17 shows all the dependent and independent variables that will be used in the econometric model.
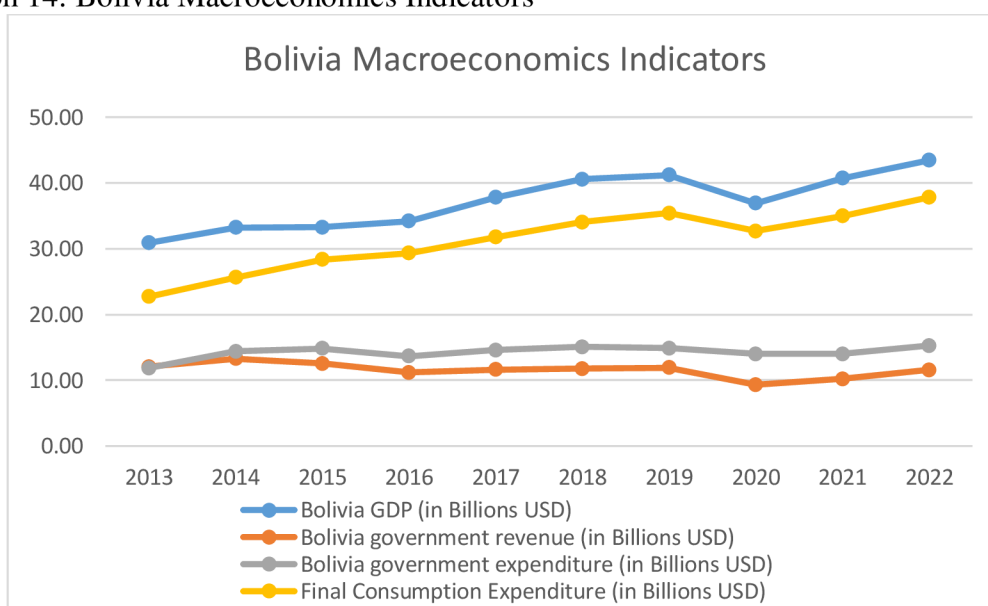
Table 19: Bolivia Macroeconomics Indicators

Year	Bolivia GDP (in Billions USD)	Bolivia government revenue (in Billions USD)	Bolivia government expenditure (in Billions USD)	Final Consumption Expenditure (in Billions USD)
2013	30.88	12.07	11.87	22.70
2014	33.24	13.26	14.38	25.62
2015	33.24	12.53	14.82	28.35
2016	34.19	11.17	13.65	29.31
2017	37.78	11.63	14.58	31.76
2018	40.58	11.75	15.05	34.06
2019	41.19	11.88	14.86	35.41
2020	36.90	9.32	14.01	32.67
2021	40.70	10.20	14.00	34.98
2022	43.43	11.58	15.27	37.81

Source: International Monetary Fund (IMF) & World Bank (WB)

Besides, of showing the data validation for the econometric model, it was important for this research to also reflect in the graph 13 the variables and the participation in the GDP.

Graph 14: Bolivia Macroeconomics Indicators

Source: Own calculation based on International Monetary Fund (IMF)

4.4 Economic model and econometric model

One-equation model

Table 20: Data for Economic Model

Year	Bolivia GDP ($us in Billions)	UNIT VECTOR	Bolivia government revenue (in Billions USD)	Bolivia government expenditure (in Billions USD)	Final Consumption Expenditure (in Billions USD)
	Yt	X1t	X2t	X3t	X4t
2013	30.88	1	12.07	11.87	22.70
2014	33.24	1	13.26	14.38	25.62
2015	33.24	1	12.53	14.82	28.35
2016	34.19	1	11.17	13.65	29.31
2017	37.78	1	11.63	14.58	31.76
2018	40.58	1	11.75	15.05	34.06
2019	41.19	1	11.88	14.86	35.41
2020	36.90	1	9.32	14.01	32.67
2021	40.70	1	10.20	14.00	34.98
2022	43.43	1	11.58	15.27	37.81

Source: International Monetary Fund (IMF)

The economic model that will be displayed and discussed throughout the whole narrative of this research is a simplified representation of reality based on the relevant economic theory. According to the table 18, the simple- model elaborates on the GDP, the Gross Domestic Product in Bolivia in the period from 2013 to 2022.

4.5 Data set

It is important firstly to order the data to process in GRETL (table 21), in that way, all the variables will be named according to our assignation in the methodology.

This dataset will be used in GRETL:

Table 21: Data for GRETL

	Yt	X1t	X2t	X3t	X4t
2013	30.88	1	12.07	11.87	22.70

2014	33.24	1	13.26	14.38	25.62
2015	33.24	1	12.53	14.82	28.35
2016	34.19	1	11.17	13.65	29.31
2017	37.78	1	11.63	14.58	31.76
2018	40.58	1	11.75	15.05	34.06
2019	41.19	1	11.88	14.86	35.41
2020	36.90	1	9.32	14.01	32.67
2021	40.70	1	10.20	14.00	34.98
2022	43.43	1	11.58	15.27	37.81

Source: Input Data for application GRETL

It is necessary to check if there is multicollinearity problem in aapplication GRETL using our data. To find out if there is a collinearity issue, a correlation matrix was created as we can see down below in the Figure 1. Correlation matrices are used to identify multicollinearity between exogenous variables (explaining variables).

Figure 1: Correlation matrix for the model
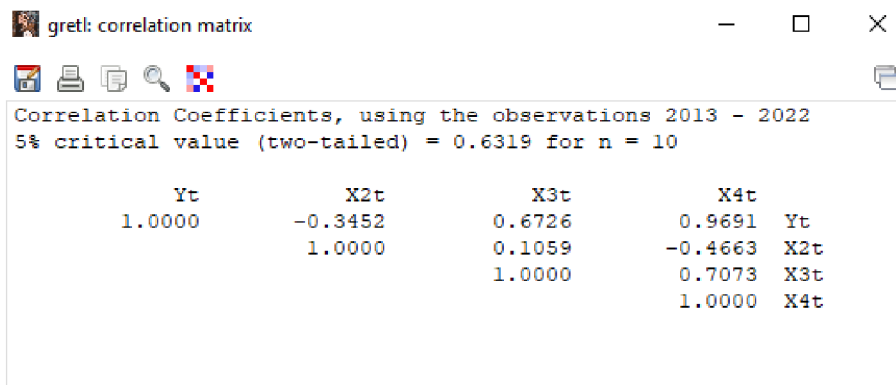
Source: Output Data for application GRETL

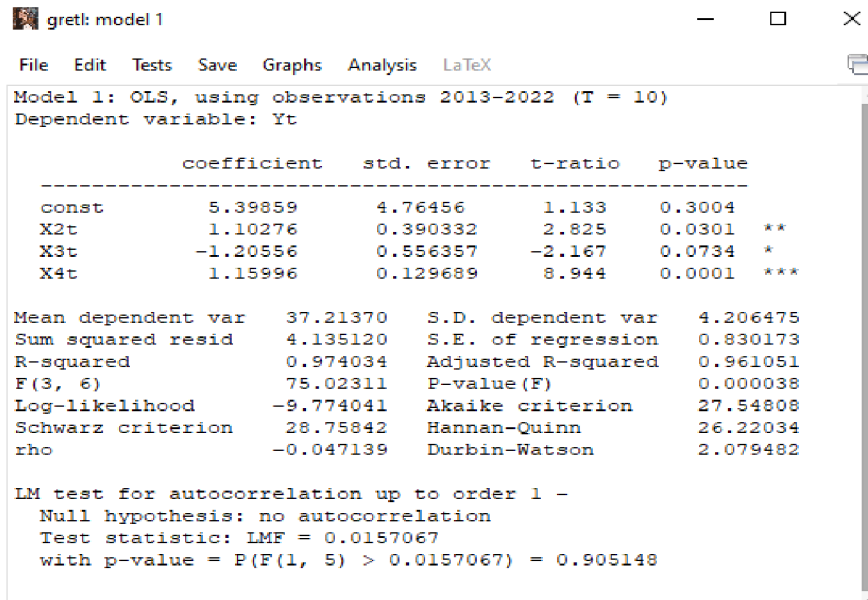Based on the correlation matrix, it was found that there is no correlation problem in this data set (As it is stated if the relation between the coefficients of independent variables is greater than 0.8 or less than -0.8 the econometric model has multicollinearity problems)

For that reason, there is no need to transform any independent variable into a dummy variable to subtract multicollinearity.

4.6 Parameter's estimation

With the help of GRETL software, vectors of estimated parameters were calculated. The output is shown in Figure 2.

Figure 2: Estimated parameters for the econometric model


```
gretl: model 1                                              —    □    ×

File   Edit   Tests   Save   Graphs   Analysis   LaTeX                    ⧉

Model 1: OLS, using observations 2013-2022 (T = 10)
Dependent variable: Yt

                coefficient    std. error    t-ratio    p-value
     --------------------------------------------------------------
     const         5.39859       4.76456       1.133     0.3004
     X2t           1.10276       0.390332      2.825     0.0301    **
     X3t          -1.20556       0.556357     -2.167     0.0734    *
     X4t           1.15996       0.129689      8.944     0.0001    ***

Mean dependent var    37.21370   S.D. dependent var    4.206475
Sum squared resid      4.135120   S.E. of regression   0.830173
R-squared              0.974034   Adjusted R-squared   0.961051
F(3, 6)               75.02311   P-value(F)            0.000038
Log-likelihood        -9.774041   Akaike criterion     27.54808
Schwarz criterion     28.75842   Hannan-Quinn         26.22034
rho                   -0.047139   Durbin-Watson         2.079482

LM test for autocorrelation up to order 1 -
   Null hypothesis: no autocorrelation
   Test statistic: LMF = 0.0157067
   with p-value = P(F(1, 5) > 0.0157067) = 0.905148
```

Source: Output Data for application GRETL

Based on ordinary least squares, the econometric model would have the shape denoted in the equation (4):

$$Y_{1t} = 5.39 + 1.10\ X_{2t} - 1.20\ X_{3t} + 1.15\ X_{4t} + U_t \tag{4}$$

4.7 Model verification

In economic verification, we assess the direction and intensity of the action of exogenous (explanatory) variables on the endogenous (explanatory) variable. Therefore, it is possible to say by how many units exactly, the endogenous (explicated) variable would change, if there is a unit change of the exogenous or predetermined (explicated) variable under otherwise unchanged conditions, i.e., ceteris paribus conditions.

4.7.1 Economic verification

Interpretation:

- If other variables are zero, Bolivia's GDP is 5.39 billion USD per year

- If the Bolivian government revenue increases by 1 billion, the GDP of Bolivia will increase by 1.10 billion per year and this seems quite certain.
- If the Bolivian government expenditure increases by 1 billion, the GDP of Bolivia will decrease by 1.20 billion per year.
- If the Bolivian final consumption expenditure increases by 1 billion, the GDP of Bolivia will increase by 1.15 billion per year and this seems quite certain.

4.7.2   Heteroskedasticity
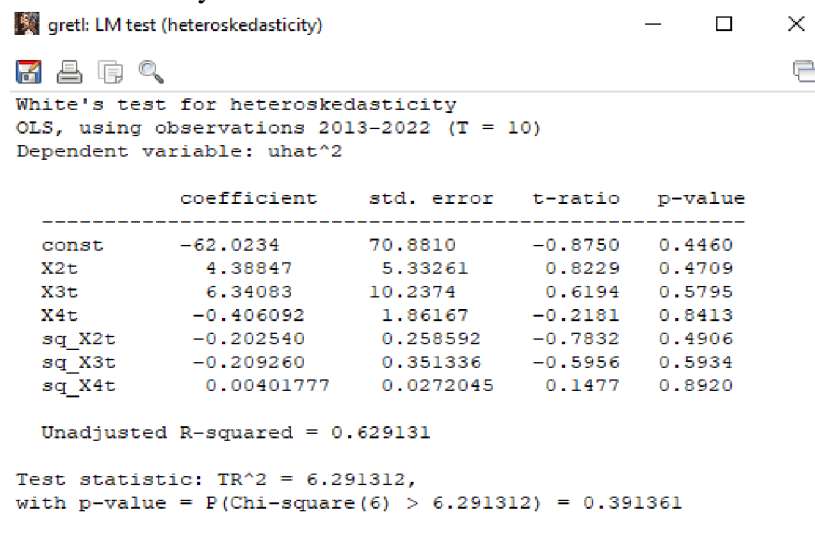
H0 = No heteroskedasticity in the model (homoskedasticity)

HA = There is heteroskedasticity

Rule: p-value < α = Reject H0

p-value > α = Accept H0

Significance level = 0,05

Figure 3: Heteroskedasticity in the econometric model


```
gretl: LM test (heteroskedasticity)                    —    □    ×

White's test for heteroskedasticity
OLS, using observations 2013-2022 (T = 10)
Dependent variable: uhat^2

                coefficient    std. error    t-ratio    p-value
     -----------------------------------------------------------
     const      -62.0234       70.8810       -0.8750    0.4460
     X2t          4.38847       5.33261        0.8229    0.4709
     X3t          6.34083      10.2374         0.6194    0.5795
     X4t         -0.406092      1.86167       -0.2181    0.8413
     sq_X2t      -0.202540      0.258592      -0.7832    0.4906
     sq_X3t      -0.209260      0.351336      -0.5956    0.5934
     sq_X4t       0.00401777    0.0272045      0.1477    0.8920

     Unadjusted R-squared = 0.629131

     Test statistic: TR^2 = 6.291312,
     with p-value = P(Chi-square(6) > 6.291312) = 0.391361
```

Source: Output Data for application GRETL

0.39 > α = Accept H0

We cannot reject the null hypothesis.

There is homoskedasticity in the model.

4.7.3   Autocorrelation

Breusch-Godfrey test is used for testing of autocorrelation. In this case there is tested first-order autocorrelation of random variable.

Hypothesis of Breusch-Godfrey test:
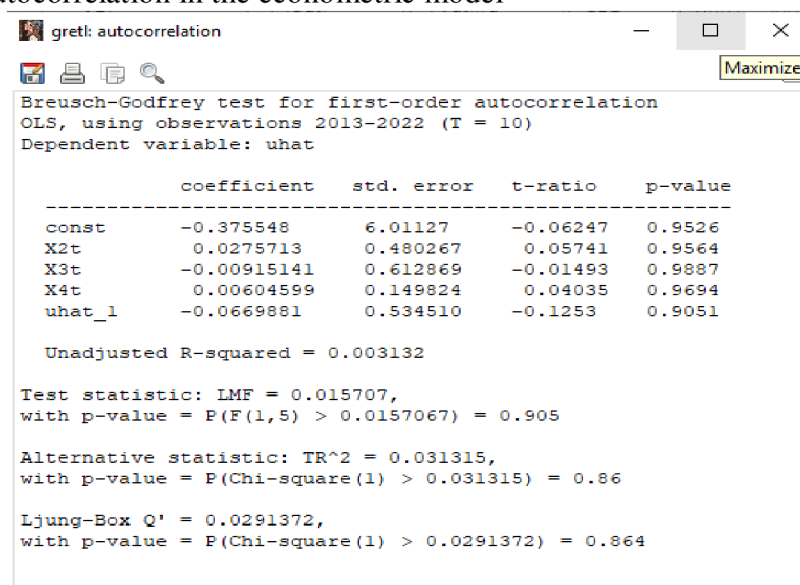
H0: Not presence of autocorrelation

H1: Presence of autocorrelation

Rule: p-value < α = Reject H0

p-value > α = Accept H0

Significance level (α) = 0,05

Figure 4: Autocorrelation in the econometric model

Source: Output Data for application GRETL

Table 22: Breusch-Godfrey test

P-value of the test	Comparison	Level of significance
0.905	**0.905 > 0.05**	0.05
0.860	**0.860 > 0.05**	0.05
0.864	**0.864 > 0.05**	0.05

Source: Own calculation

We cannot reject the null hypothesis in all three cases.

There is not first-order autocorrelation in the model.

4.7.4 Normality of Residuals

H0 = Residuals are normally distributed
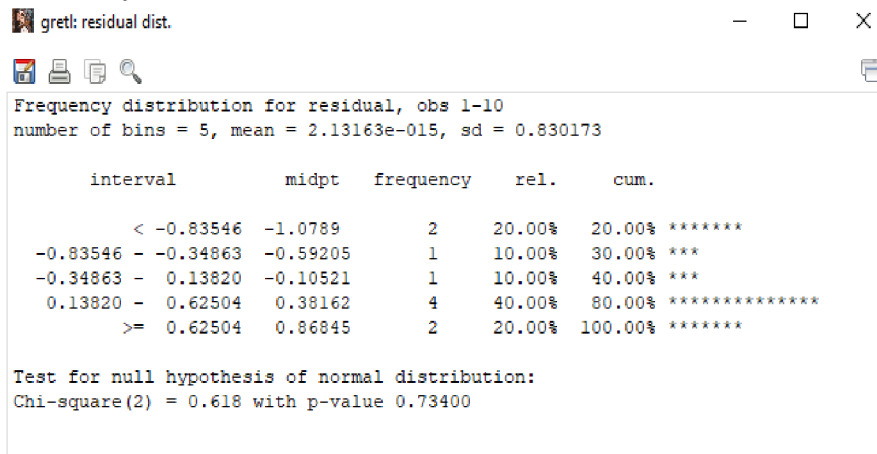
HA = No normal distribution of residuals

Rule: p-value < α = Reject H0

p-value > α = Accept H0

Significance level (α) = 0,05

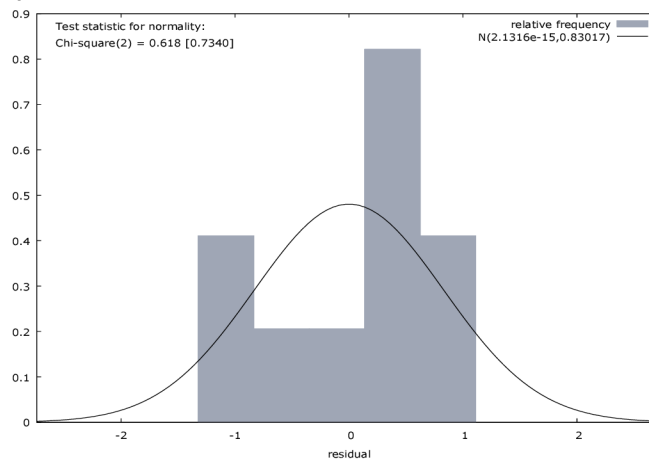Figure 5: Normality of residuals in the econometric model

Source: Output Data for application GRETL

0.734 > α = Accept H0

We cannot reject the null hypothesis.

Residuals are normally distributed in the model.

Graph 15: Normality of residuals in the econometric model

Source: Output Data for application GRETL

4.7.5 Chow test

H0 = Stability of parameters

HA = Not stability of parameters

Rule: p-value < α = Reject H0

      p-value > α = Accept H0

Significance level (α) = 0,05

Figure 6: Chow test in the econometric model


```
gretl: Chow test output                                    —    □    ×

Augmented regression for Chow test
OLS, using observations 2013-2022 (T = 10)
Dependent variable: Yt

              coefficient   std. error   t-ratio    p-value
   -----------------------------------------------------------
   const       -110.097       95.0615     -1.158     0.3664
   X2t           12.8576       9.38912     1.369     0.3044
   X3t          -11.3131       8.44896    -1.339     0.3125
   X4t            5.28897      3.60262     1.468     0.2798
   splitdum     115.859       95.6522      1.211     0.3495
   sd_X2t       -11.9420       9.40547    -1.270     0.3319
   sd_X3t        10.5653       8.53904     1.237     0.3415
   sd_X4t        -4.26865      3.60644    -1.184     0.3582

Mean dependent var    37.21370    S.D. dependent var    4.206475
Sum squared resid      0.769260   S.E. of regression    0.620185
R-squared              0.995169   Adjusted R-squared    0.978263
F(7, 2)               58.86203    P-value(F)             0.016805
Log-likelihood        -1.364826   Akaike criterion     18.72965
Schwarz criterion     21.15033    Hannan-Quinn         16.07417
rho                   -0.460126   Durbin-Watson         2.898456

Chow test for structural break at observation 2017
  F(4, 2) = 2.18773 with p-value 0.3375
```

Source: Output Data for application GRETL

0.33 > α = Accept H0

We cannot reject the null hypothesis.

There is stability of parameters in the model.

4.8 Model application

4.8.1 Elasticity coefficients

First, it is necessary to calculate the theoretical values of $\hat{y}$ with our estimated parameters stated in the econometric equation:

$$Y_{1t} = 5.39 + 1.10\ X_{2t} - 1.20\ X_{3t} + 1.15\ X_{4t} + U_t$$

Replacing the values, this is the outcome for theoretical Y in the table 23:

Table 23: Theoretical values of ŷ

Year	Theoretical value of endogenous variable
	ŷt
2013	31.07
2014	32.73
2015	34.53
2016	35.55
2017	37.75
2018	39.96
2019	41.89
2020	36.93
2021	40.58
2022	43.82

Source: Own calculation

Formula for computing elasticity coefficient is following:

$$E = \frac{\partial y}{\partial xi} * \frac{xi}{\hat{y}}$$

Where:

E = Elasticity

x_i = Relevant explanatory variable

$\hat{y}$ = Theoretical value of endogenous variable

$\frac{\partial y}{\partial xi}$ = Partial derivation of the given function

For the Year 2022:

- Elasticity of Government revenue:

$$\frac{\partial y}{\partial xi} = 1.10$$

$$E = \frac{\partial y}{\partial x2} * \frac{x2}{\hat{y}} = 1.10 \times \frac{11.58}{43.82} = \textbf{0.29 \%}$$

1% growth in government revenue causes 0.29 % increase in gross domestic product.

- Elasticity of Government expenditure:

$$\frac{\partial y}{\partial xi} = -1.20$$

$$E = \frac{\partial y}{\partial x2} * \frac{x2}{\hat{y}} = -1.20 \times \frac{15.27}{43.82} = \mathbf{-0.42} \%$$

1% growth in government expenditure causes 0.42 % decrease in gross domestic product.

- Elasticity of Consumption:

$$\frac{\partial y}{\partial xi} = 1.15$$

$$E = \frac{\partial y}{\partial x2} * \frac{x2}{\hat{y}} = 1.15 \times \frac{37.81}{43.82} = \mathbf{0.99} \%$$

1% growth in Final consumption expenditure causes 0.99 % increase in gross domestic product.

The most effect on gross domestic product has been proved for consumption as its elasticity coefficient reaches the highest level among the others.

4.8.2   Prognosis

The prognosis should be estimated according to the formula $Y_{n+j} = M * X_{n+j}$

First of all, the prognosis for exogenous variables should be estimated based on trend function.

Graph 16: Prognosis in the econometric model
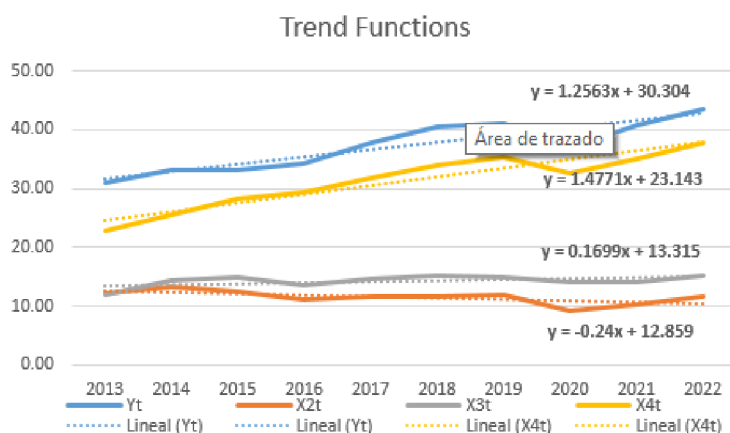
Source: Own calculation

According to the Graph 16, the trend functions for the exogenous variables were estimated using excel.

Estimated trend functions:

$X_{2t} = 12.85 - 0.24\ X_t + U_{1t}$

$X_{3t} = 13.31 + 0.16\ X_t + U_{1t}$

$X_{4t} = 23.14 + 1.47\ X_t + U_{1t}$

Prognosis of t x'2 for year 2023:

It is necessary to insert $X_{T\,(n+j)} = 11$

n = number of observations = 10 : j = 1

$X_{2t} = 12.85 - 0.24\ (11) = 10.21$

$X_{3t} = 13.31 + 0.16\ (11) = 15.07$

$X_{4t} = 23.14 + 1.47\ (11) = 39.31$

Subsequently, prognosis of endogenous variable may be calculated.

$$\hat{Y}_{2023} = 5.39 + 1.10\ X_{2t} - 1.20\ X_{3t} + 1.15\ X_{4t} + U_t$$

$$\hat{Y}_{2023} = 5.39 + 1.10\ (10.21) - 1.20\ (15.07) + 1.15\ (39.31)$$

$$\hat{Y}_{2023} = 43.74$$

The prognosis for the exogenous variable (GDP) for 2023 is estimated in 43.74 Billions USD.

5   Result and Discussion

The outcomes and results of this thesis will be presented accordingly to the practical part:

Firstly, it is necessary to highlight the importance to get the data from known and recognized entities worldwide, in that way is possible to obtain reliable data. This research was focused on get the data through two main sources: International Monetary Found and World Bank. The data obtained was standardized and converted in the same scale and the same currency which was in Billions of USD, calculated under current prices.

After the data was standardized, it was important to check if there is multicollinearity problem in the model, as a result was identified that there is no correlation prolem in the data set, without finding strong relation between independent variables, and that is a positive point because the correlation cause several issues in the model's estimation and interpretation. On this wise the coefficients do not have high standard errors, making it difficult to determine their true relationship with the dependent variable.

Secondly, the model was executed with GRETL application using OLSM getting the parameters for the estimation of the equation, where the interpretations are accordingly to the theory; stating that the government revenue and final consumption influence positively in the econometric model and the government expenditure affect negatively on the gross domestic product.

Executing the econometric verification it is stated that the model fits with the data, by comparing the model's prediction with the actual observed, capturing the relationship among variables and explaining the variation in the dependent variables.

When there is heteroscedasticity in a model means that the OLS estimates may become inefficient and biased, leading to incorrect inference about the model parameters and so forth the result for this test was to accept the null hypothesis as there is homokedasticity in the model, confirming there is consistency in the standard errors of coefficients estimates and enhancing the robustness of the model.

This time series model also included the Breush-Godfrey test for autocorrelation, since no autocorrelation was detected in all three cases the model confirms validation in the model with the variables, in such manner there was no need to consider additional explanatory variables or dynamic relationships in the model, confirming accuracy in the statistical inference.

After checking the normality of residuals where the residuals are normally distributed and that ensures the residuals are approximately normally distributed for a valid statistical inference. Chow test dropped as a result stability of parameters in the model, accepting the null hypothesis can improve the accuracy of forecasts by capturing changes in the underlying relationships between the variables.

The elasticity plays a crucial role in the policy analysis by assessing the potential impact of policy changes, in this way were calculated the elasticities for all the independent variables confirming that the variable of final consumption expenditure causes 0,99 % positively changes in the Bolivian gross domestic product.

The prognosis calculations are useful when it comes to predict future values, in this model the prognosis was calculated based on our trend functions for each independent variable, where our goal was to calculate the Bolivian GDP for 2023, where the result was 43.74 billion of USD. This result comparing to the real GDP on 2023 which was 45.98 billions of USD has an accuracy of 95.12%, in this case this result and the calculations were approximately.

6 Conclusion

Based on the results, the hypothesis mentioned at the beginning are the followed:

1. Effect of government revenue:

Alternative Hypothesis (H1): There is a significant and positive relationship between government revenue (X_{2t}) and the GDP (Y_{1t}).

The coefficient of government revenue (X_{2t}) is statistically significant (1.10) and has a positive sign. This indicates that an increase in government revenue leads to an increase in GDP, contrary to the null hypothesis.

2. Effect of government expenditure:

Alternative Hypothesis (H1): There is a significant and negative relationship between government expenditure (X_{3t}) and the GDP (Y_{1t}).

The coefficient of government expenditure (X_{3t}) is statistically significant (-1.20) and has a negative sign. This indicates that an increase in government expenditure leads to a decrease in GDP, contrary to the null hypothesis.

3. Effect of Final Consumption Expenditure:

Alternative Hypothesis (H1): There is a significant and positive relationship between Final Consumption Expenditure (X_{4t}) and the GDP (Y_{1t}).

The coefficient of final consumption expenditure (X_{4t}) is statistically significant (1.15) and has a positive sign. This indicates that an increase in final consumption expenditure leads to an increase in GDP, contrary to the null hypothesis.

Summarizing all the independent variables are statistically significant and has a positive/negative impact over the GDP (not equal to zero).

Down below are the breakdowns of this research:

Natural gas, minerals (such as zinc, lead, silver, and gold), and agricultural goods (like soybeans and quinoa) are among Bolivia's main export commodities. Global commodity price fluctuations have a major effect on Bolivia's export earnings and, in turn, its GDP.

Worldwide economic factors, such as shifts in interest rates, inflation, and worldwide demand, also have an impact on Bolivia's economy. Major trade partners' economic

downturns or recessions may lower export demand and have a detrimental impact on Bolivia's GDP growth. The key factors influencing economic growth are strong economic policy, efficient governance, and political stability. GDP growth are favorably impacted by stable policies that encourage investment, entrepreneurship, and productivity.

Bolivia's budgetary sustainability and economic growth are significantly influenced by its tax policy. The nation's tax structure has changed over time, and major changes have been made recently to encourage more equality, efficiency, and transparency. Bolivia's government has been able to fund its social programs and development objectives thanks to a significant rise in tax income collection.

To enhance Bolivia's tax policy, a number of issues still need to be resolved despite the progress that has been accomplished. Tax evasion and informality are still major issues, thus continued efforts are required to increase tax compliance and broaden the revenue base. Furthermore, administrative hurdles and the tax code's complexity may deter investment and economic expansion, necessitating the modernization and simplification of the tax code.

Bolivia's tax laws have advanced significantly, and the nation can create a more stable and long-lasting fiscal structure that fosters economic growth and lowers poverty and inequality by carrying out ongoing initiatives to increase compliance, streamline the tax code, and increase transparency.

Finally it is important to mention that the COVID-19 pandemic has had significant repercussions on Bolivia's economy, leading to disruptions in trade, tourism, and domestic economic activities. Government responses, including fiscal stimulus measures and public health interventions, have influenced GDP growth, government revenue, expenditure, and consumption patterns.

7   References

Andersson, K., & Gibson, C. C. (2007). Decentralized governance and environmental change: Local institutional moderation of deforestation in Bolivia. Journal of Policy Analysis and Management, 26(1), 99-123.

Arauco, V. P., et al. (2014). Explaining low redistributive impact in Bolivia. Public Finance Review, 42(3), 326-345.

Contreras, M. E. (1990). Debt, taxes, and war: the political economy of Bolivia, c. 1920–1935. Journal of Latin American Studies, 22(1-2), 265-287.

Jenkins, G., et al. (1991). A Review Of Tax Policies And Administration In Bolivia. Development Discussion Papers, (1991-10).

Kaimowitz, D., Thiele, G., & Pacheco, P. (1999). The effects of structural adjustment on deforestation and forest degradation in lowland Bolivia. World Development, 27(3), 505-520.

Brummitt, R., & Erskine, F. (2023). Lithium and the green energy transition: A critical review. Resources, Policy and Management, 12(3), 235-252.

CEPAL (Comisión Económica para América Latina y el Caribe). (2021). Effects of the Global Financial and Economic Crisis on the Bolivian Economy: A CGE Approach. https://www.cepal.org/sites/default/files/events/files/documento_carlos_machicado_inesad_bolivia.pdf

CIA World Factbook. (2024). https://www.cia.gov/

The Economist. (2023, January 21). A glimmer of hope for Bolivia. https://www.economist.com/the-americas/2023/04/18/bolivia-is-on-the-brink-of-an-economic-crisis

FAOSTAT. (2023). https://www.fao.org/faostat/en/

Klein, H. S. (2014). A Concise History of Bolivia. Cambridge University Press.

Pett, M. (2023, March 1). Bolivia: A land of contrasts. BBC Travel. https://www.bbc.com/news/world-latin-america-18727507

United Nations Comtrade. (2023). https://comtrade.un.org/

World Bank. (2023). Bolivia. https://www.worldbank.org/en/country/bolivia

BBC News. (2013, October 28). Bolivia's Morales wins landslide re-election. https://www.dailymail.co.uk/debate/article-11790831/ANDREW-NEIL-youre-expecting-Labour-landslide-missed-Keir-Starmers-word-salad.html

Konrad Adenauer Foundation. (n.d.). Constitutional history of Bolivia. https://www.constituteproject.org/constitution/Bolivia_2009

Al Jazeera. (2022, December 30). Bolivian judge places opposition leader in pre-trial detention. https://www.aljazeera.com/news/2022/12/30/bolivian-judge-places-opposition-leader-in-pre-trial-detention

Center for Economic and Policy Research. (2023, January 25). OAS continues to dodge accountability for actions in the 2019 Bolivian election. https://cepr.net/report/analysis-of-the-2019-bolivia-election/

Reuters. (2020, September 18). The silence on the US-backed coup against Evo Morales in Bolivia. https://www.theguardian.com/world/2019/nov/17/bolivia-more-volatile-than-ever-as-president-flees-and-leaders-denounce-a-coup

France 24. (n.d.). Bolivia. https://www.france24.com/en/tag/bolivia/

International Monetary Fund (IMF). (n.d.). Fiscal policies. https://www.imf.org/en/Topics/fiscal-policies

Khan Academy. (n.d.). Lesson Summary: Fiscal Policy. https://www.khanacademy.org/economics-finance-domain/ap-macroeconomics/national-income-and-price-determinations/fiscal-policy-ap/a/lesson-summary-fiscal-policy

International Monetary Fund (IMF). (2022, December 19). Bolivia: 2022 Article IV Consultation-Press Release; Staff Report; and Statement by the Bolivian Authorities; IMF Country Report. https://www.imf.org/en/Publications/CR/Issues/2022/11/01/Bolivia-2022-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-525346

CEPAL. (2014). Bolivia 1. General trends. In Economic Survey of Latin America and the Caribbean 2014 (pp. 71-77). https://www.cepal.org/en/publications/37033-economic-survey-latin-america-and-caribbean-2014-challenges-sustainable-growth

International Monetary Fund (IMF). (2022, December 19). Bolivia: 2022 Article IV Consultation-Press Release; Staff Report; and Statement by the Bolivian Authorities; IMF Country Report. https://www.imf.org/en/Publications/CR/Issues/2022/11/01/Bolivia-2022-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-525346

World Bank. (2023, January 11). Bolivia. https://www.worldbank.org/en/country/bolivia

Mankiw, N. Gregory. (2022). Macroeconomics (10th ed.). Worth Publishers

Hill, R. C., & Griffiths, W. E. (2008). Principles of econometrics (4th ed.). John Wiley & Sons.

Kotlikoff, L. J., & Summers, L. H. (1981). The role of intergenerational transfers in aggregate capital accumulation. Journal of Political Economy, 89(4), 706-732.

Mankiw, N. G. (2014). Principles of economics (7th ed.). Cengage Learning.

Mishkin, F. S. (2015). The economics of money, banking, and financial markets (11th ed.). Pearson.

Modigliani, F. (1986). Life cycle, individual thrift, and the wealth of nations. Nobel Memorial Lecture, December 8, 1985. Journal of Political Economy, 94(3), 443-469.

Sekkat, K., & Varoudakis, A. (2000). Exchange rate management and manufactured exports in Sub-Saharan Africa. Journal of Development Economics, 61(1), 237-253.

United Nations. (2009). System of national accounts 2008. United Nations Publications.

Analysis | Passport. (n.d.). Retrieved March 8, 2023, from https://www-portal-euromonitor-com.infozdroje.czu.cz/portal/Analysis/Tab

Bolivia confronts tax fraud with greater transparency | EUROsociAL II | Programa Para la Cohesión Social en América Latina. (n.d.). Retrieved March 9, 2023, from

http://eurosocial-ii.eurosocial.eu/en/noticia/bolivia-se-enfrenta-al-fraude-fiscal-con-mas-transparencia

Bolivia Personal Income Tax Rate—2022 Data—2023 Forecast—2007-2021 Historical. (n.d.). Retrieved March 8, 2023, from https://tradingeconomics.com/bolivia/personal-income-tax-rate

Bolivia—Corporate—Other taxes. (n.d.). Retrieved March 9, 2023, from https://taxsummaries.pwc.com/bolivia/corporate/other-taxes

Bolivia—Indirect Tax Guide—KPMG Global. (2021, October 28). KPMG. https://kpmg.com/xx/en/home/insights/2018/10/bolivia-indirect-tax-guide.html

Caribe, C. E. para A. L. y el. (2014). Impactos de las reformas recientes de política fiscal sobre la distribución del ingreso: El caso del Estado Plurinacional de Bolivia. CEPAL. https://www.cepal.org/es/publicaciones/36827-impactos-reformas-recientes-politica-fiscal-la-distribucion-ingreso-caso-estado

Extent of public corruption in Bolivia. (n.d.). Worlddata.Info. Retrieved March 9, 2023, from https://www.worlddata.info/america/bolivia/corruption.php

Fund, I. M. (2007). Bolivia: Selected Issues. IMF Staff Country Reports, 2007(249). https://doi.org/10.5089/9781451805833.002.A002

Jenkins, G., & Larrain, L. (1991). A Review Of Tax Policies And Administration In Bolivia. Development Discussion Papers, Article 1991–10. https://ideas.repec.org//p/qed/dpaper/96.html

Los Principales Impuestos en Bolivia. (n.d.). Retrieved March 8, 2023, from https://asesorateenbolivia.com/contenido/los-principales-impuestos-en-bolivia

Ministerio de Economia y Finanzas Publicas | Viceministerios. (n.d.). Retrieved March 8, 2023, from https://www.economiayfinanzas.gob.bo/viceministerio-de-politica-tributaria.html

Población y Hechos Vitales. (n.d.). INE. Retrieved March 9, 2023, from https://www.ine.gob.bo/index.php/censos-y-proyecciones-de-poblacion-sociales/

Revenue Statistics in Latin America and the Caribbean: Bolivia (Edition 2021). (n.d.). [Text]. Retrieved March 8, 2023, from

https://www.oecd.ilibrary.org/taxation/data/oecd-tax-statistics/revenue-statistics-in-latin-america-and-the-caribbean-bolivia-edition-2021_afc79fd7-en

Sector Fiscal | Banco Central de Bolivia. (n.d.). Retrieved March 8, 2023, from https://www.bcb.gob.bo/?q=sector-fiscal

Tax revenue (% of GDP)—Bolivia | Data. (n.d.). Retrieved March 8, 2023, from https://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS?locations=BO