
The Fall in Gas Exports, International Reserves and Economic Growth in Bolivia

Cesar Daniel Vargas Diaz¹, Hernan Delgadillo Dorado², Eloy Wilson Villca Copali³

¹Department of International and Spanish Economics, Faculty of Economic and Business Sciences, University of Granada, Granada, Spain

³Department of Economics, Faculty of Economic Sciences, Universidad Mayor de San Simón, Cochabamba, Bolivia

³Department of Administration, Faculty of Economic Sciences, Universidad del Valle, Cochabamba, Bolivia

Email address:

cvargasd@ugr.es (Cesar Daniel Vargas Diaz), hdelgadillo@umss.bo (Hernan Delgadillo Dorado),

ewwillcac@cochabamba.bo (Eloy Wilson Villca Copali)

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Abstract: The objective of this article is to offer an overview of the deterioration of Bolivia's economic growth, in the period 2013 to 2022, mainly of the macroeconomic variables of study such as gross domestic product, natural gas exports, net international reserves, external debt and imports of diesel and gasoline fuels. Each of these variables are dependent on the foreign currency dollars. In this understanding, the deterioration is mainly due to the fall in gas exports since 2015 that the country's gas production falls because the government on duty, allocated more investment to exploitation than to exploration, generating a decrease in foreign exchange earnings dollars to the country, failing to cover subsidies for diesel and gasoline fuels imported in dollar foreign currency. This is mainly due to the fact that half of Bolivia's GDP growth in the last 15 years is due to the sale of gas to Brazil and Argentina in foreign currency in dollars, since it does not cover the subsidies of imported fuels with gas, net international reserves are used to exhaust them at their maximum level. At the same time, the gradual increase in external debt in foreign currency dollar. The fall in gas exports and the increase in imports of diesel and gasoline fuels due to the growth of the vehicle fleet, as reflected in historical data and where we identify the four stages of inflection. In the last stage, it was characterized with a shortage of dollars and a high demand for it by citizens and the government, added to the lack of transparency in the disclosure of information of net international reserves and dependence on non-renewable resources results in a deterioration of the economic growth of the gross domestic product. In addition, Bolivia is characterized by not promoting science, knowledge, qualified human capital, research, development and technological innovation, which led to a high level of informal employment and insufficient productive sustainability in foreign currency.

Keywords: Net International Reserves, Gas Exports, External Debt, Gross Domestic Product, Economic Growth

1. Introduction

Economic growth deteriorates in Bolivia after the exhaustion of gas exports, the fall of international reserves and the increase in external debt, are insufficient to cover the obligations mainly of subsidies of imported fuels, as well as interest and amortizations of the external debt, according to the reports of the Ministry of Economy and Finance (2023) [20]. The National Statistical Institute (2023) and the Central Bank of Bolivia (2023) [24, 4] and in the face of a shortage of foreign currency, mainly dollars and added to the lack of

transparency in the disclosure of information on these variables, as mentioned by Vargas *et. al.* (2017) [37].

To the above, the Ministry of Economy and Finance (2023) [20] and the Central Bank of Bolivia (2023) [4] have reacted with short-term policies, with some measures to increase the availability of dollars. According to the author Loza (2023) [16] breaks down these policies into three parts: First, market your gold reserves to have greater liquidity in foreign currency. Second, a higher preferential exchange rate has been implemented for exporters to encourage them to sell dollars to the National Institute of Statistics of Bolivia (2014)

[23] and third, pending loans from international organizations to finance infrastructure projects, they will most likely be used to correct the shortage of dollars. Thus, these measures would temporarily increase the supply of foreign currency dollars and would allow to maintain, in the short term, the fixed exchange rate policy and the high level of public spending and the fiscal deficit (Loza, 2023) [16].

Thus, the purpose of this article is to offer an overview of the deterioration of the economic growth of the Gross Domestic Product (GDP) in Bolivia, in the aforementioned period from 2013 to 2022, mainly of these macroeconomic variables of study such as the export of natural gas, Net International Reserves (NIR) and external debt, to cover mainly the imports for the subsidy of diesel and gasoline fuels, each of these variables are dependent on the foreign currency dollars.

To do this, we will define the theories of economic growth based on economic models of renewable resources such as science, research and knowledge of qualified human capital and non-renewable resources based on the sale of raw materials and will also study theories on the transparency of the disclosure of economic information, financial and monetary. From these theories, we will study the case of Bolivia with the macroeconomic variables already mentioned and identify the stages of inflection in the period of study analysis and identifying economic growth model used by Bolivia.

2. Reflections on Economic Growth

Over the years, as mentioned by the authors Franco and Ramírez (2005) [8] they study the pioneers of economic growth such as Schumpeter (1934) [29] but focus more on Harrod (1942) and Domar (1946) [10, 7], the latter begin to lay the foundations for the explanation of economic growth, from the multiplier and the accelerator. The endogenous neoclassical model of Solow (1956) [30] with the capital product ratio by changing the production function of fixed coefficients to one of variable coefficients. For Romer (1986) [27] the essential idea of endogenous growth is that the returns on capital, public capital and knowledge among others, are not decreasing and, therefore, their accumulation does not cease.

The new trends of economic growth may not be really desirable, it is that not everything that is spent is renewable, such as many raw materials or many geological reserves such as coal, oil, gas, etc. (Martínez and Vidal, 1995) [17]. According to Mochón (2000) [21] economic growth refers to the increase in indicators, such as production, consumption, savings, investment and the trade balance, the improvement of these indicators should theoretically lead to better living standards of the population.

But it is necessary to consider Romer (1986) [27] who explains that there are two types of endogenous growth models, those that suppose perfect competition and those that have introduced imperfect competition to be able to consider Research and Development and models of perfect

competition Technology is disseminated without costs. Romer's (1990) [28] the key is the accumulation of human capital and knowledge, especially through direct learning in the workplace, also Ray (1998) [25] considers that the generation of sustained economic growth is through technological innovation and scientific knowledge.

To the above we can deduce that the theories mentioned, focused on qualified human capital through research and development and technological innovation are the horizon of sustainable and renewable economic growth and the theories sustained in the sale of non-renewable resources such as the sale of raw materials are generators of economic growth but in different temporalities.

3. Technologies and Transparency of Information

With respect to Information and Communication Technologies (ICT) and the Internet, they are tools, mainly web pages are a channel for governments to be more transparent when disclosing monetary, economic and financial information and the authors Vargas, Delgadillo and Villca (2022) and Vargas (2011a) [38, 35]. The main international organizations such as the World Bank (2014), the International Monetary Fund (1999) and the United Nations (2005) and Transparency International (2014) [13-40]. are focused on making ICT and the Internet and websites the appropriate instrument for the implementation of Electronic Governments (Vargas, 2011b) [36], all with the same nuance of generating greater transparency by disclosing information to citizens (Vargas, 2011a) [35].

All these organizations and many others propose Codes for "good practices", the International Monetary Fund (1999) [13] proposes a Code of good practices called "Code of good practices on transparency in monetary and financial policies" focused on transparency in disseminating information on the resources administered by each Government in its management, considering ICT, internet and websites as essential tools, as mentioned by Transparency International (2014), World Bank (2004), United Nations (2005) and International Monetary Fund (1999) [13-33, 39]. To demonstrate these theories, we will see the model of the economy of Bolivia, for this we will address the following section.

4. Economic Growth, ICT and Transparency in Bolivia

Bolivia, characterized internationally by its leading role in economic GDP growth for several years, low and controlled inflation and a stable financial system in national currency, in the search for a long-term relationship between economic growth and development of the financial system, as had been studied by Humérez and Yáñez (2010) and Diaz and Rocabado (2016) [11, 6].

According to the authors Gutiérrez *et al.* (2009) [9]

analyze the process of determining economic growth in Bolivia based on measures of financial depth like Morales (2007) [22], the results suggest that the financial sector in Bolivia is too small, even if the component of the deposit rate is high to have a significant impact on economic growth in the same way authors agree at different times Dell'ariccia et. al. (2008), Reinhart et. al. (2001) and Larrazabal (1989) [5, 26-14]. But this scenario changed, according to risk rating agencies such as Standard & Poor's (2023) [31] where Bolivia is in the Ratings lowered long-term sovereign ratings from 'B' to '-B' due to weakening of the liquidity of the external currency, the outlook is negative, due to the variation of the Net International Reserves.

Given the above, the Ministry of Economy and Finance (2022) [19] ratifies and promotes the dynamism and economic growth based on non-renewable resources and the expected performance resulting from several industrialization projects with import substitution in the process of implementation, replacing the export of Natural Gas, such as the Zinc Separation Plant, the Mutún Project, the new NPK Fertilizer Plant, start-up of the Biodiesel Plant, the entry into larger-scale production of lithium carbonate and its concentrates, accompanied by actions aimed at making efficient use of spending in public administration.

On the other hand, the Ministry of Development and

Planning (2002) [18] bases the guidelines for Bolivia's strategy in the digital age and transparency of information in Bolivia and the authors Vargas et. al. (2012) [34] argue that it is necessary for Electronic Government to enter Bolivia and solve and make viable Bolivian Public Management for Efficiency, Transparency and Citizen Participation.

According to the authors Afcha et. al. (1992) [1], Bolivia always had to face since the 90s external vulnerability, fiscal policy and macroeconomic adjustment and growth, after more than 30 years we still have the same symptoms that affect the economic growth of Bolivia, after the exhaustion of natural gas exports, the fall of international reserves and the increase of the external debt and the import for the subsidy of diesel and gasoline fuels that we study separately for its better understanding and analysis in the following sections.

4.1. The Export of Natural Gas

Since 2014, exports of Gas, Bolivia's main product, have steadily decreased due to its lower production, as a result of the low investment executed in recent years after the nationalization of this industry, and the lower demand of its only two buyers Argentina and Brazil according to data from the Central Bank of Bolivia (2022) [4] and the Bolivian Institute of Foreign Trade (2022) [2] See Figure 1.

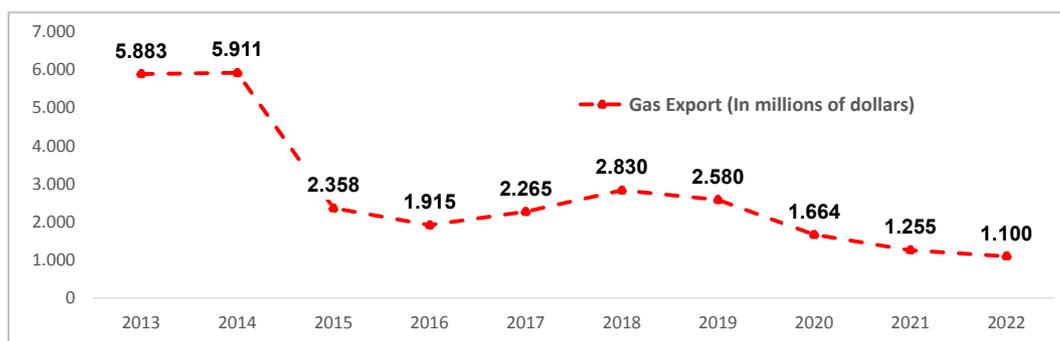


Figure 1. Bolivia's gas export in foreign currency.

Period: 2013 to 2022 (In millions of dollars)

Source: National Statistical Institute (2023) and Bolivian Institute of Foreign Trade (2022)

According to the Bolivian Institute of Foreign Trade (2022) [2] Bolivia exported in a decade almost 27,761 millions of dollars for the sale of natural gas between 2013 and 2022, reaching its maximum record in 2013 with 5,883 million dollars. By 2022, external gas sales declined to 1.1 million dollars. This, added to the end of the boom in gas prices, led to a reduction in the entry of foreign currency or dollars and tax revenues, while public spending remained at high levels of 36% of GDP by 2022.

4.2. Imports of Diesel and Petrol Fuels

For many years, according to information released on its website by the National Institute of Statistics (2023) and authors López and Baruch (2011) [24, 15], Bolivia has

maintained a system of fuel price subsidies, with the aim of keeping consumer prices relatively low and fostering economic growth. However, these subsidies have had a significant fiscal cost for Bolivia, since they have implied a significant expenditure on fuel subsidies (López and Baruch, 2011) [15].

According to official sources released in the reports of the National Statistical Institute (2023) and the Bolivian Institute of Foreign Trade (2022) [24, 2] that can be seen in Figure 2, imports of fuels, such as gasoline and diesel, increased significantly, from 1,216 million dollars in 2013 to 4,320 million dollars in 2022, noting that the year 2020 had a decrease in fuels due to the pandemic of the COVID-19. Likewise, the constant growing trend of the automotive fleet, which went from 1,327 thousand

vehicles in 2013 to 2,494 to a thousand vehicles, and if it continues at this rate of growth Bolivia will need more

fuels for its vehicle fleet (Bolivian Institute of Foreign Trade, 2022) [2].

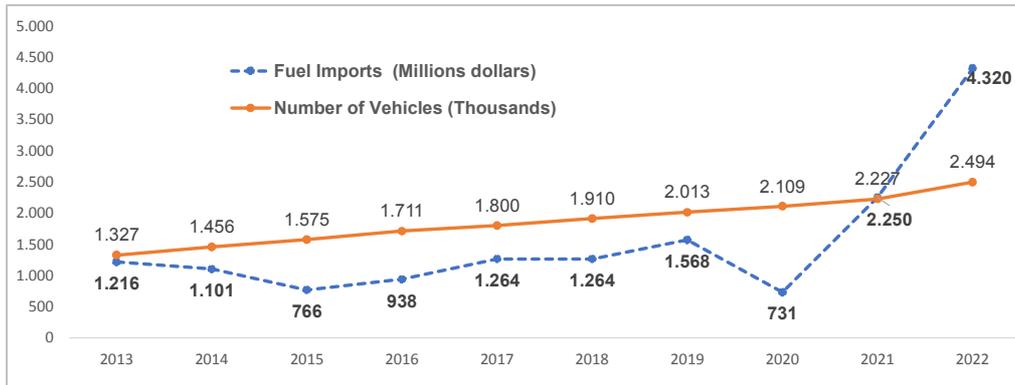


Figure 2. Bolivia fuel imports and number of vehicles.

Period: 2013 to 2022 (In thousands and millions of dollars)
 Source: National Statistical Institute (2023) and Bolivian Institute of Foreign Trade (2022)

4.3. Net International Reserves

Net International Reserves in the last ten years, according to reports from the Central Bank of Bolivia (2023) [4], decreased from 15,123 million of dollars in 2014 to 3,796 million of dollars by 2022, see Figure 3.

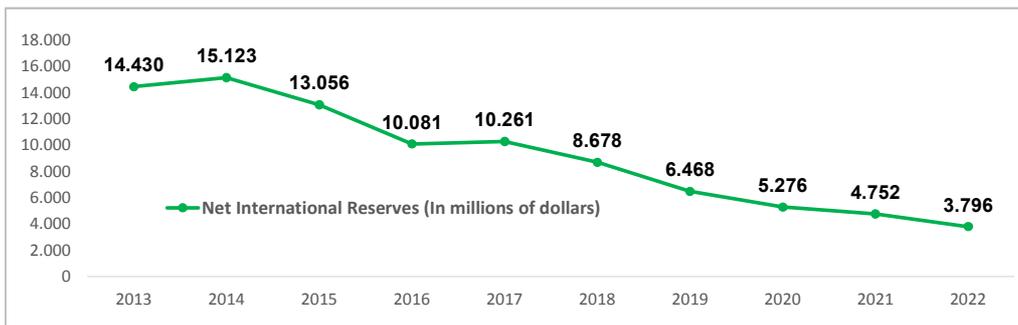


Figure 3. Bolivia's net international reserves in foreign currency.

Period: 2013 to 2022 (In millions of dollars)
 Source: Central Bank of Bolivia (2023)

4.4. External Debt

In the recent report of the Central Bank of Bolivia (2023) [4] on external debt during the last ten years, it is growing and amounts to 12,000 million of dollars, as can be seen in Figure 4.

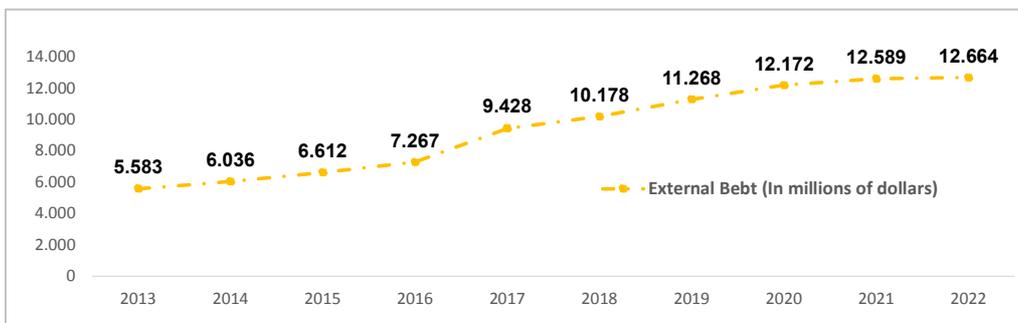


Figure 4. Bolivia's external debt in foreign currency.

Period: 2013 to 2022 (In millions of dollars)
 Source: Central Bank of Bolivia (2023)

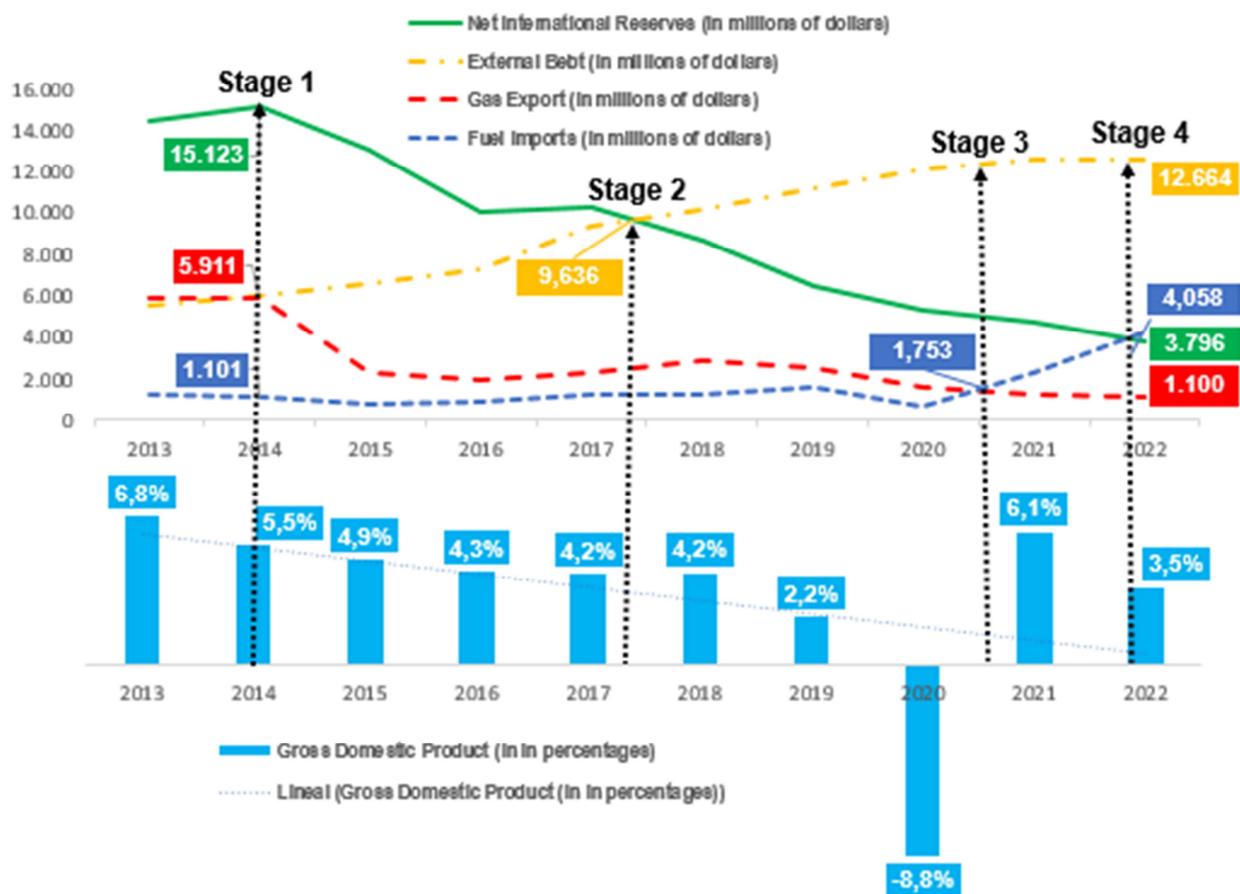
Bolivia's external debt tends to rise year after year in 2022 reached 12,664 million dollars, 3.5% more than in all of 2020, according to official data from the Central Bank of Bolivia (2022) [4], see Figure 4. Likewise, financing costs could continue to rise due to a greater risk of default on the external debt, due to lower revenues and the increase in interest payments and amortization. In fact, Bolivia does not have investment grade according to Standard & Poor's (2023) [31], suffered a downgrade in its credit rating and the country risk increased by up to 12 percentage points since the end of February 2023, when the strong depletion of international reserves became evident due to the shortage of foreign currency. Once the variables have been studied separately, we will analyze them together and identify the inflection stages in the last decade of the period 2013 to 2022, for this,

we address the following section.

5. Bolivia's Inflection Stages and Growth Rate Gross Domestic Product

For the government of Bolivia, the fundamental variable was the export of natural gas to generate income in foreign currency, that is, dollars, while the export of gas covered obligations in foreign currency, followed by Net International Reserves and later by external debt, mainly to cover subsidy imports of gasoline and diesel fuels.

For a better understanding and analysis, we will identify the inflection stages that these macroeconomic variables had in the period 2013 to 2022 and that is detailed below see Figure 5.



Source: National Statistical Institute (2023), Bolivian Institute of Foreign Trade (2022) and Central Bank of Bolivia (2022)

Figure 5. Bolivia's inflection stages and Growth rate Gross Domestic Product. Period: 2013 to 2022 (In millions of dollars and percentage's).

Stage 1. Gas exports and the RIN reach their maximum and cover fuel subsidies, it was since 2014 when gas exports reached their highest peak of 5,911 million dollars and in the same way the RIN reached its highest level of 15,023 million dollars, since that year gas exports fall, the RIN and the external debt begins to grow, each of the three variables with the same purpose of covering mainly the subsidy of diesel and gasoline fuels, see Figure 5.

Stage 2. RIN intercepts with the external debt and gas

exports still cover fuel subsidies, since 2014, the RIN began to be used and the decline of the same began and the external debt began to grow until mid-2017 and 2018 where both the RIN and the external debt are intercepted, having an average value of 9,636 million dollars and gas exports reaching only 2,548 million dollars, less than half compared to 2014, see Figure 5, but there was still foreign currency dollars to meet its obligations as a State of Bolivia.

Stage 3. Gas exports match fuel subsidies and reserves fall

and external debt increases, in mid-2020 and 2021, natural gas exports and fuel subsidies are intercepted, it is the turning point, where gas exports of approximately 1,753 million dollars reach their limit, See Figure 5. From this point on, more international reserves and more foreign currency debt are used.

Stage 4. Shortage of dollars, gas exports and the RIN do not cover fuel subsidies and external debt reaches its maximum, see Figure 5, since mid-2017 and 2018, and the years 2019, 2020, 2021 and 2022 the external debt grows significantly reaching a value of 12,664 million dollars, of the same the RIN with the same trend but decreased until reaching 3,796 million dollars and gas exports reach a minimum of 1,100 million dollars by 2022. In this year 2022, the fourth turning point is born where the policies of capturing foreign currency begins in the face of the shortage of dollars by the Central Bank of Bolivia (2023) [4], in order to have greater liquidity in foreign currency dollars to cover obligations such as fuel subsidies, amortization and interest on external debt.

From this fourth stage, imports for fuel subsidies exceeded gas exports and international reserves and what remains is external debt and other financing mechanisms and fresh economic resources to cover these obligations, or apply structural policies.

To all the above, Bolivia's economic growth deteriorates mainly due to the problems that worsened since 2014 when lower exports and the constant fall in the price of gas decreased significantly as well as the entry of foreign currency or foreign currency, to the point of having a shortage of dollars throughout the Bolivian economy and international reserves were reduced minus 3,500 million in February 2023.

According to the latest report officially published by the Central Bank of Bolivia (2023) [4], the Gross Domestic Product (GDP) of Bolivia registered an economic growth of 3.48% for the year 2022, it is estimated for the year 2023 to fall even GDP of 2.7% according to the [12] International Monetary Fund (2023) and World Bank (2023) [12, 40], see Figure 5.

From the aforementioned theories on economic growth, we see that Bolivia is based its economy on non-renewable resources in the extractives of raw materials, as mentioned by Martínez and Vidal (1995) and Mochón (2000) [17, 21] and export non-renewable resources without added value. At the same time, the scarce transparency of the disclosure of economic, monetary and financial information by the government of Bolivia and, not complying with the codes of good transparency practices of the international organizations International Monetary Fund (1999), United Nations (2005) and Transparency International (2014) [13, 32, 33].

Considering the labor policies of the Bolivian government, to grow day by day the state apparatus towards a greater fiscal deficit, greater corruption and bureaucracy by not having qualified human capital, rather partisan. Without supporting the private productive apparatus, added to the high labor informality and not betting on science, research, development and technological innovation through qualified

human capital, but despite all this, Bolivia had an economic growth for several years, mainly due to the sale of its non-renewable resources, that is, an economic growth of short and medium term and, not so long-term economic growth based on non-renewable resources.

6. Conclusions

We can conclude that, for the government of Bolivia, the fundamental variable was the export of natural gas to generate income in foreign currency, that is, dollars, as we could see in the inflection stages, while the export of gas covered the obligations in foreign currency, mainly the subsidy imports of gasoline and diesel fuels. But Bolivia's economic growth deteriorates mainly due to the problems that worsened in stage 1, since 2014 when lower exports and the constant fall in the price of gas decreased significantly as well as the entry of foreign currency or foreign currency, and the situation worsened in stages 2 and 3 and reaching stage 4 to the point of having a shortage of dollars throughout the country. Bolivia's economy and international reserves were reduced to 3.5 millions of dollars in February 2023.

We can also conclude that, from the aforementioned theories on economic growth, we see that Bolivia is based its economy on the export of non-renewable resources on the extractives of raw materials without added value. At the same time, Bolivia is characterized by little transparency in the disclosure of economic, monetary and financial information and not as recommended by the international organizations IMF, EU, WB and Transparency International.

Therefore, we conclude dependence on non-renewable resources results in short- and medium-term economic growth, but not so long-term. Bolivia does not consider science, knowledge, research, development and technological innovation in its economic growth, which led to a high level of informal employment without sustainability with a productive apparatus without qualified human capital.

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