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**The economic challenges of post-extractivism in the south.
The Colombian case**

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Contents

CHAPTER 1. JUSTIFICATION, OBJECTIVES, METHODOLOGY, AND RESEARCH QUESTION	1
1.1 JUSTIFICATION	1
1.2 RESEARCH QUESTION AND OBJECTIVES	3
1.3 METHODOLOGY	4
CHAPTER 2. LITERATURE REVIEW	4
CHAPTER 3. THEORETICAL FRAMEWORK	7
3.1 FINANCIALISATION AND MONETARY SYSTEM. A POST-KEYNESIAN APPROACH	7
3.2 THEORY OF DEVELOPMENT	10
3.3 ECOLOGICAL ECONOMICS	11
CHAPTER 4. POST-EXTRACTIVISM	13
4.1 THE STAGES OF POST-EXTRACTIVISM	15
CHAPTER 5. CHALLENGES OF POST-EXTRACTIVISM	16
5.1 PREBISCH-SINGER CONDITION, MONEY HIERARCHY AND POST-EXTRACTIVISM	17
5.1 EXTERNAL RESTRICTIONS AND POST-EXTRACTIVISM AGENDA	22
CHAPTER 6. THE COLOMBIAN CASE	23
6.1 COLOMBIAN CONTEXT	23
6.2 POST-EXTRACTIVE POLICIES IN COLOMBIA	29
6.3 IMPACTS OF STRANDING FOSSIL FUELS	30
6.3.1 <i>Impacts due to the government announcements</i>	31
CHAPTER 7. POLICY RECOMMENDATION	36
CHAPTER 8. CONCLUSION	36
REFERENCES	38

List of Tables

Table 1. *Impacts to not sign new exploration and exploitation agreements in the oil and gas sector*

30

List of Figures

Figure 1. <i>Greenhouse gases emission by type. Worldwide 2020.</i>	1
Figure 2. <i>The capacity factor of different sources of energy. 2020.</i>	2
Figure 3. <i>Relationship between the planet and the economy</i>	11
Figure 4. <i>Use of the energy worldwide 2019.</i>	12
Figure 5. <i>Global energy consumption Twh and GDP in US dollars from 1800 to 2016</i>	12
Figure 6. <i>Co2 Emissions billions of tonnes and GDP USD dollars for the world. 1800-2019</i>	13
Figure 7. <i>Growth of world energy generation and GDP growth. 1986-2020.</i>	14
Figure 8. <i>High-technology exports as % of final exports vs mineral and fossil fuels exports as % of final exports</i>	18
Figure 9. <i>Denomination of international transactions</i>	19
Figure 10. <i>World reserves by currency 2022</i>	19
Figure 11. <i>A schematic representation of the mechanisms behind financial subordination.</i>	22
Figure 12. <i>Participation of different economic sectors in the Colombian GDP in constant currency terms, 2021.</i>	24
Figure 13. <i>Three principal export goods in Colombia in 2021</i>	25
Figure 14. <i>Foreign investment in Colombia per economic activity in 2019</i>	25
Figure 15. <i>Current account balance as part of the GDP and oil prices 2003-2021 for Colombia</i>	26
Figure 16. <i>Oil prices and Colombian economic growth.</i>	26
Figure 17. <i>Complexity export 2002-2020 for Colombia</i>	27
Figure 18. <i>The poverty rate for OECD countries 2020</i>	28
Figure 19. <i>Unemployment rate for OECD countries 2021</i>	28
Figure 20. <i>Central bank policy rates for different economies. February-September 2022</i>	32
Figure 21. <i>Depreciation of the local currency. March-October 2022 for different currencies</i>	33
Figure 22. <i>Nominal depreciation between 1st August- 28 October</i>	34
Figure 23. <i>Nominal exchange rate Colombian pesos and USD dollars. October 2021-October 2022</i>	34

List of Equations

Equation 1. <i>Net trade in economy β</i>	17
Equation 2. <i>Net international trade in economy α</i>	17
Equation 3. <i>International balance</i>	17

List of Acronyms

OECD	Organisation for Economic Co-operation and Development
IMF	International Monetary Fund
WB	World Bank
FED	The Federal Reserve Board of Governors

Abstract

Post-extractivism promotes the reduction of fossil fuel extraction to limit the economy to planetary boundaries. In this research, I will analyse how the external restrictions affect the post-extractive agenda in the south from a heterodox perspective. The question is addressed through a theoretical reflection based on the currency hierarchy theory. Moreover, I analyse the Colombian case using secondary data to confirm my hypothesis. I found that countries with a fossil fuel dependency have a weak position in the monetary system which reduces their policies space. As a result, peripheries cannot strand fossil assets. Otherwise, they will face economic and financial instability. Therefore, economies at the south have to choose between environmental protection or financial instability.

Relevance to Development Studies

Climate change is affecting the entire world. Thus, it is necessary to study the different solutions to solve the climate crisis. Moreover, climate issues are related to our economic, political, and social system. Then, the study of ecological topics implies a discussion about our development model. Therefore, this research is relevant to development studies because it provides a critical perspective of our development model focusing on macroeconomics and financial aspects.

Keywords

Post-extractivism, external restrictions, currency hierarchy theory, Colombia, climate change, decarbonisation, unburn fossil fuels

Introduction

Post-extractivism is a Latin American school of thought. Their authors argue that the extractive model is unsustainable over time. From this approach, it is mandatory to reduce the extraction of minerals and hydrocarbons to ameliorate environmental and social impacts (Gudynas, 2011;2015; Acosta, 2016). However, countries in the global south face restrictions in achieving this objective.

First of all, fossil fuels provide energy to the economy. There is a positive correlation between energy generation and production. If countries want to phase out fossil fuels, they have to use alternative energy sources. Nevertheless, renewable energies do not have the same power as fossil energies (Storm, 2009; U.S Energy information administration, 2021). Therefore, a reduction in fossil fuel extraction will affect the economy.

Secondly, peripheries have less policy space due to their low position in the currency hierarchy (Löscher & Kaltenbrunner, 2022; de Paula, et al., 2017; Löscher, 2022). According to the currency hierarchy theory, the currencies at the top of the hierarchy are determined by the liquidity premium, which depends on four factors: The position in the international market, the global acceptability of the currency, the possibility to denominate debt positions, and the political force of the government.

Countries with a dependency on fossil fuels tend to have a permanent external deficit which affects their financial position. Therefore, these economies are located at the bottom of the hierarchy. As a result, peripheric economies have external constraints¹ which reduces its policy space (Löscher & Kaltenbrunner, 2022). Due to this limit, countries cannot formulate some policies.

In these economies, fossil fuels provide most of the hard currency supply. Then, if an economy in the south with a dependency on fossil fuels reduces its extraction, it will face a shortage of hard currency creating economic and financial instability. The economic instability is caused by the fact that the south is a net importer of capital goods. Then, the lack of hard currency will reduce these imports creating higher costs and inflation pressure.

Moreover, the shortage of hard currencies will create financial instability because investors would reduce their economic expectations. It generates capital outflows and depreciation of the exchange rate. Likewise, the lack of hard currencies creates financial instability due to the impacts on international reserves. Therefore, economies with a significant dependency on fossil fuels cannot strand fossil assets because they will face financial and economic instability.

These challenges affect the possibility of reducing fossil fuel extraction in the south. Related to this topic, some authors have studied macroeconomic challenges (Sotelo & Francke, 2011). They found that stranding fossil assets impacts the external and fiscal deficit. In the same line, some investigations analyse how financial imbalances reduce the formulation of economic policies to reduce environmental damage (Aglietta & Coudert, 2016; Aguila, et al., 2022; Löscher, 2022; Löscher & Kaltenbrunner, 2022).

¹ It is defined as the necessity to get hard currency to boost the economic growth (Thirlwall, 2011; Perez & Vernengo, 2020).

Other scholars have analysed equity considerations of this topic (Caney, 2016) (Bradley, et al., 2020) (Stockholm Environment Institute, 2016). They found that economies in the south face more challenges to phase out fossil fuels. Finally, Samaniego et al. (2022) and Gramkow & Porcile (2022) have examined the environmental and economic challenges of decarbonisation in the south considering external restrictions. Although there are some studies related to post-extractivism and macroeconomics, it is necessary to investigate more about external constraints. Then, I will analyse how external restrictions affect post-extractivism in the south from a heterodox perspective.

Three reasons motivate this investigation. First of all, the economy must decarbonise to reduce environmental damage. Nevertheless, many economies in the south have a dependency on fossil fuels. At least 35% of the exports from Ecuador, Colombia, Bolivia, Chile, and Venezuela are commodities from the mining sector (Harvard, 2022). Thus, it is important to understand the dynamics and challenges associated with the decarbonisation of the economies in the south.

Secondly, some countries have analysed the economic transition from a heterodox approach. Peru, Bolivia and Ecuador have discussed post-extractivism and other heterodox perspectives to achieve the economic transition (Gudynas, 2011; Acosta, 2015; 2016). However, there is a lack of investigation into macroeconomic issues related to the post-extractive agenda. Hence, this research will enrich the debate from the macroeconomic approach giving special analysis to financial issues.

Third, there is a lack of research on ecological issues from a heterodox approach considering the limits of the south. Degrowth theory, ecological economics, and other theories have not considered the south's performance in detail.

This investigation is based on a theoretical reflection. I will use three schools for my theoretical framework; the post-Keynesian theory, the development school and the ecological economics theory. Moreover, I will do a case study based on the Colombian experience to confirm my hypothesis. Colombia is following the post-extractive agenda because its government is promoting different economic policies to reduce the extraction of fossil fuels. Nonetheless, external restrictions limit the possibility of diminishing oil dependency (Semana, 2022).

This research has two important innovations. First, I will analyse post-extractive policies considering external restrictions using a heterodox framework. My investigation will focus on the dynamic of the monetary system as a barrier to limit our economies to planetary boundaries. Secondly, it will be the first investigation which analyses the Colombian case using a heterodox perspective.

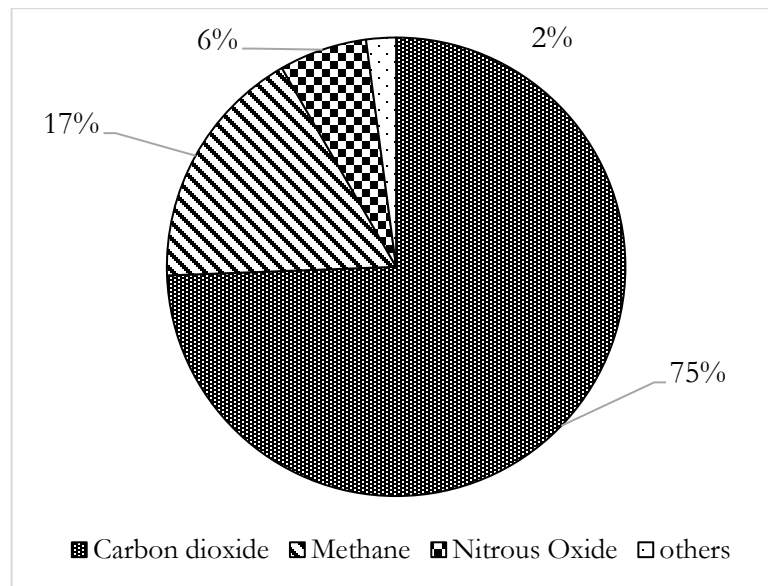
This research has eight parts. First, the justification of the investigation, objectives, methodology, and research question. Secondly, the literature review. Third, I will present the theoretical framework. Fourth, I will explain what is post-extractivism. Five, I will analyse the issues of these school. Sixth, I will examine the Colombian case. Seven, policy recommendations and finally, the conclusion.

Chapter 1. Justification, Objectives, methodology, and research question

1.1 Justification

Climate change is one of the main issues in our society. This phenomenon is caused by greenhouse gases like carbon dioxide (C_2O), oxide nitrous (N_2O), methane (CH_4), and ozone (O_3) (Benavides Ballesteros & León Aristizabal, 2007).

Figure 1. Greenhouse gases emission by type. Worldwide 2020.



Source: (Oxford University, 2020)

Figure 1 depicts that 75% of greenhouse gas emissions are C_2O . Therefore, governments must formulate public policies to reduce C_2O emissions to address the climate crisis. According to (Benavides Ballesteros & León Aristizabal, 2007), burning fossil fuels is the main cause of C_2O emissions. Then, it is necessary to reduce fossil fuel extraction.

There are two ways to unburn fossil fuels. First, demand policies. The objective of these policies is to reduce the consumption of some products to discourage fossil extraction. For instance, consumption ban or taxes. The second way is supply policies, from this perspective, policymakers reduce fossil extraction directly. For example, moratoria, swap debts, reverse auctions, and others (Pellegrini, et al., 2021; Lazarus & Van Asselt, 2018; Macekura, 2016).

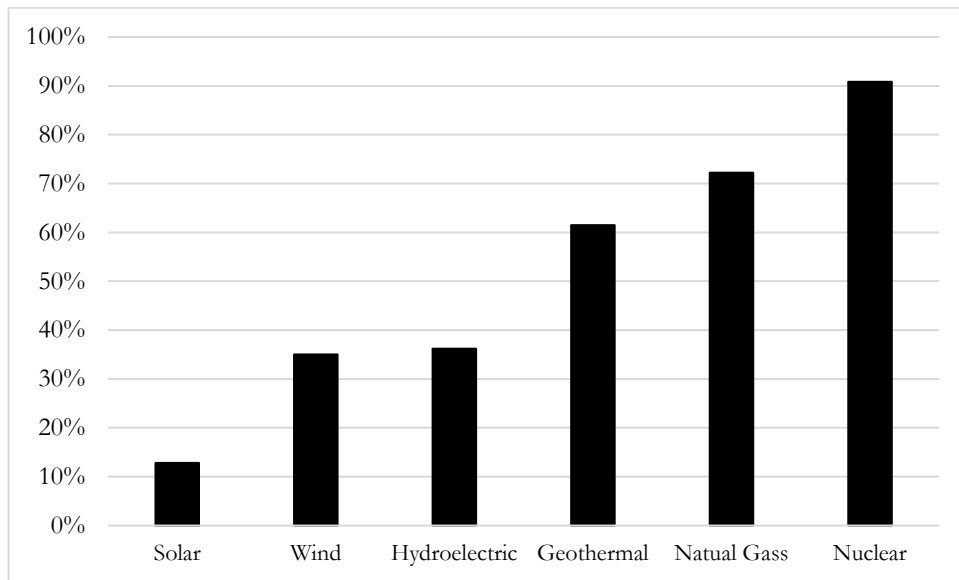
Demand policies try to reduce consumption to ameliorate production (Pellegrini, et al., 2021; Lazarus & Van Asselt, 2018). However, there are at least two problems with these policies. First, the lack of demand will reduce prices in the medium term. Thus, it would encourage fossil-fuel extraction in countries without climate commitments (Pellegrini, et al., 2021). This effect is called the Jevons

paradox. Therefore, in the medium term, the net effect of greenhouse gas emissions will remain constant.

Secondly, demand policies take more time to reduce greenhouse gases emission because the reduction of extraction of fossil fuels depends on the contraction of consumption.

Third, people and companies would reduce the demand for fossil fuels if there were enough alternatives to substitute them. However, it is difficult to replace fossil fuels because renewable energies are not energy efficient as fossil fuels (U.S Energy information administration, 2021; Storm, 2009). Figure 2 depicts that fossil energy is more powerful than renewable energy. Since there is a positive correlation between energy and production, an economy based on renewable energies will affect the economy. Companies will face higher costs, or they must reduce their production.

Figure 2. The capacity factor of different sources of energy². 2020



Source: (U.S Energy information administration, 2021)

Due to these issues, some authors have argued that supply policies are better (Pellegrini, et al., 2021; Lazarus & Van Asselt, 2018). They found three advantages of these policies:

1. Supply-side policies will reduce profits. It will discourage new investment in the sector and reduce mining companies' political force.
2. The effects are more observable. People will put more pressure to continue with these policies.
3. Demand policies have an indirect effect, while the supply side is direct. It will speed up the reduction of greenhouse gases emission.

Lazarus & Van Asselt (2018) state that these policies could be organised into three categories. Economic instruments (Export taxes, removal subsidies for mining companies and others), regulatory approaches (Limit the production, prohibition of some extractions and others) and provision of goods and services (Funding to unburn fossil fuels).

² The net capacity factor is the ratio of electrical energy output over the maximum possible electrical energy output.

An essential issue in demand and supply policies is that they only work correctly if there are countries with climate commitment. For example, a moratorium in Ecuador will not reduce greenhouse gases emission if other countries extract more oil. Then, an international legal framework must force governments to formulate some policies to limit the economy to planetary boundaries. Although this legal enforcement affects national sovereignty, the lack of global commitment will impact the whole society.

This debate is essential because it provides ideas to formulate policies to solve the climate crisis. In this way, the Post-extractivism school is promoting supply side policies to limit our economy to planetary boundaries. Its authors state that economies must strand fossil assets (Gudynas, 2011;2015; Acosta, 2016). Nonetheless, economies face different restrictions in formulating this policy. First, there are not enough alternatives to replace fossil fuels (U.S Energy information administration, 2021; Storm, 2009). Renewable energies do not generate the same energy power as fossil fuels. Therefore, there will be less energy generation which affects the whole economy. Secondly, economies in the south have an export dependency on fossil fuels. If these countries phase out fossil fuels, they will face a shortage of hard currencies affecting their economic and financial instability.

In this investigation, I will analyse external constraints and post-extractivism for four reasons. First, the economy must decarbonise to reduce environmental damage. Nevertheless, many economies in the south have a dependency on fossil fuels. Thus, it is crucial to understand the dynamics and challenges associated with the decarbonisation of the economies in the south.

Secondly, there is not enough literature related to this topic. Caney (2016), Bradley, et al. (2020), Stockholm Enviroment Institute (2016) have studied the impact of stranding fossil assets considering equity aspects. Likewise, Sotelo & Francke (2011) have examined the impacts of post-extractive policies in Peru. Finally, Samaniego et al. (2022) and Gramkow & Porcile (2022) study ecological and external variables considering social issues. However, there is not a complete research line of macroeconomics and post-extractivism from a heterodox perspective.

Third, there is a gap related to monetary imbalances and post-extractivism. Few investigations analyse the relationship of ecological issues and the disparities of the monetary system (Aglietta & Coudert, 2016; Aguila, et al., 2022; Löscher, 2022; Löscher & Kaltenbrunner, 2022). Nonetheless, there is not a research line about post-extractivism and imbalance of the monetary system from a heterodox perspective.

Four, heterodox ecological schools have not studied the particularities of the south. Degrowth theory, ecological economics, and other theories have not considered the south's performance in detail.

Therefore, this investigation will contribute to the literature related to post-extractivism and external restrictions considering the particularities of the south from a heterodox perspective.

1.2 Research question and objectives

Research question. How do external restrictions affect the post-extractive agenda in the south?

General objective. Analyse the mechanisms whereby external restrictions affect the post-extractive agenda in the global south using a heterodox economics framework.

Specific objectives.

1. Contribute to literature related to the post-extractivism school considering macroeconomic and financial aspects.
2. Formulate policy recommendations to limit the economy to planetary boundaries in the south.
3. Contribute to the decarbonisation debate from the supply side perspective considering the performance of the south.

1.3 Methodology

This investigation has a strong theoretical approach. I will analyse the environmental challenges of the economies in the south based on the ecological economics theory. Moreover, I will use the concept of financial subordination from the Post-Keynesian school to understand the financial imbalances in the economy. Finally, I will use the three gaps model and the Thirwall law to examine ecological issues considering external and social variables.

To support my arguments, I will use secondary data from official institutions. Likewise, I will analyse the Colombia case because its economy has oil dependency, and the government is promoting a post-extractive agenda. 46.3% of Colombian exports come from the oil and coal sector, and 29.4% of the foreign investment is related to fossil fuels (Banco de la República, 2022; Dane, 2022). Moreover, the new president argued an economic and energy transition is mandatory to solve the climate crisis. Then, he said that the government would not sign new oil exploitation and exploration agreements (Silla Vacía, 2022; W Radio, 2022).

While the government was promoting post-extractive policies, the international economy suffered the consequences of the higher interest rates in the United States. In Colombia, the depreciation rate was 29.2% (Banco de la República, 2022a). It created a debate about the cause of the capital outflows in Colombia, the post-extractive government policies or the US monetary policy.

Therefore, this case will help me to corroborate if the main challenge of post-extractivism is external restrictions. I will not run an econometric model because the external situation worsened in the second week of October and this research has to be submitted before 9th November. Therefore, there is not enough data to run a regression. Nonetheless, I will use secondary data to support my arguments.

Following the categorisation of (Guerring, 2007) about case studies, this case study is a confirmatory analysis because it would validate a hypothesis.

Chapter 2. Literature review

Related to post-extractivism and its challenges, there are two types of investigations. The first one is related to the theoretical approach of the problem and the second one examines the econometric impacts of stranding fossil assets considering different variables.

First of all, the theoretical investigations. Some authors examine the best strategy to unburn fossil fuels. Pellegrini, et al. (2021) and Lazarus & Van Asselt (2018) contrast demand and supply policies. Both investigations conclude that supply policies are more effective because they take less time and their have more direct effects than demand policies.

Other authors analyse the effects of the extractive model and claim for a new economic structure. In this way, Gudynas (2015) and Acosta (2016) provide a theoretical approach to understand extractive economy considering different aspects. Their main argument is that capitalism is not possible without fossil fuels. Moreover, they state that the extractive model neither protects the environment nor allows to reduce the social crisis. Therefore, they argue that it is necessary to advance towards a post-extractive society. In the same line of research, Riofrancos (2020) examines post-extractivism from a theoretical perspective focusing on some political and sociological aspects. She analyses the conflicts between neo-extractive policies and anti-extractive social movements. Finally, Acosta (2015) finds that post-extractivism and post-growth theories have similarities to each other. The author contends that the main difference between these schools is that post-extractivism studies in detail the realities of the south, whereas most post-growth theories analyse the north.

Furthermore, there are some investigations analysing some particularities of the extractive model. Gudynas (2016) studies the link between globalisation, environmental conservation, and democracy. Based on the trilemma of (Rodrick, 1996; 2011), the author proposes a quadrilemma of impossibility between democracy, sovereignty, globalisation, and environmental protection. Gudynas (2016) concludes that globalisation neither protects the environment nor guarantees national sovereignty. Another study investigates how the extractive model has encouraged corruption and illegal activities (Gudynas, 2018). He studies how multinationals take advantage of a legal vacuum to make profits. Likewise, he analyses the violation of human rights caused by oil companies. Finally, Acosta & Cajas (2020) study how countries with a large dependency on commodities have unstable democracies. Their main argument is that this model encourages a rentier system promoting the concentration of power.

Besides, there are different investigations analysing financial dynamics. Svartzman & Althouse (2022) argue that the financial system generates a dual system divided into core and periphery. They contend that the monetary imbalances do not generate investment for the energy transition. In the same way, Löscher & Kaltenbrunner (2022) study how the currency hierarchy reduces the policy space limiting the formulation of policies to solve the climate crisis. Likewise, Löscher (2022) studies the relationship between the monetary system and the climate crisis. She examines in detail how the currency hierarchy affects the possibility of formulating some policies in Africa. In another investigation, Löscher (2020) examines the same mechanism considering the Ethiopian case. Finally, Gerber (2015) analyses the challenges in implementing post-growth policies within the current financial system. He argues that the current financial system (based on profit-seeking) does not allow to implement a post-growth economy. Therefore, he proposes a local credit system to adapt the financial dynamic to the planetary limits.

In the literature on ecological and financial issues, there is a research line related to the role of the United States. Aglietta & Coudert (2016) argue that the financial system has large imbalances due the huge monetary power of the United States. Then, economies in the south depend on the US dollar which limits their policy space affecting the energy transition. In the same way, Aguila et al. (2022) state that the US dollar is a local currency and an international reserve currency simultaneously. It creates a disparity of power in the monetary system. Due to these imbalances, the south has a

constraint to invest in green projects. To solve this issue, the authors propose "Green Bancor" to promote green investment in the south.

Furthermore, some important investigations consider macroeconomic policies and external restrictions from a theoretical perspective. One of them is made by (Macekura, 2016), who studies external debt and climate issues. The author examines how the burden of external debt affects the formulation of policies to reduce environmental damage. The author proposes the swap-debt as a mechanism to reduce external debt pressure and promote green investment. In a similar way of research, Dutt & Young (2022) contend that economic decarbonisation needs global cooperation toward the same objective. They argue that the north should help the south with climate change mitigation and adaptation. Then, the north should reduce the interest rate to pay the external debt. It would minimise the debt burden in the south, giving policy space to invest in green projects.

Moreover, some scholars investigate extractivism considering some case studies. There are some investigations about post-extractivism in Peru (Gudynas, 2011) and Paraguay (Gudynas, 2017a). In both cases, the author studies specific impacts and mechanisms of the extractive model in each country. Likewise, the author provides solutions and alternatives for each case.

Finally, there is one theoretical investigation of macroeconomic policies from the perspective of ecological economics theory. Burke et al. (2013) study the different aspects of monetary and fiscal policies to adapt the economy to planetary limits. The main conclusion is that the macroeconomic objectives should change. Instead of seeking price stability and economic growth, the economy should promote sustainable well-being for humans and other species.

In the second category of investigations, there is empirical evidence of stranding fossil assets. Nevertheless, most of this research uses an orthodox theoretical framework. There are few investigations from the heterodox perspective. Sotelo & Francke (2011) analyse what would have happened if Peru had stopped the new oil extraction. They find that Peru would have run significant external and fiscal deficits.

Another heterodox investigation is made by (Samaniego, et al., 2022). The authors formulate the tree gaps model, which analyses ecological, external, and social issues. The main conclusion of this model is that external restrictions limit the development process in peripheries. Thus, the solution is to industrialise the economy to reduce external vulnerabilities and invest in the ecological transition. In the same way, Gramkow & Porcile (2022) study the three gaps model. They use the E3ME Cambridge Econometrics model, which allows to analyse economic, energy, and environmental variables. They conclude that peripheries must invest in research and development and promote the industrialisation of the economy to reduce external constraints and ameliorate the ecological damage.

Some authors have examined the impact of stranding fossil assets considering macroeconomic aspects. Bradley et al. (2020) investigate which countries should follow this policy. They use a TIAM-UCL model to analyse equity aspects. They conclude that emerging economies will face many economic problems if they phase out fossil fuels. In the same way, Caney (2016) studies what countries and under which conditions should strand fossil assets. The author concludes that the level of development and the alternative resources are crucial variables that determine the possibility of unburning fossil fuels. In the same research line, Stockholm Environment Institute (2016) examines different regions and analyses the impacts of stranding fossil fuels. They found that countries with a

high level of development will have more tools and resources to deal with the economic consequences of stranding fossil fuels.

Finally, three investigations analyse the post-extractive scenario for Colombia. They study what would happen if the government does not sign new oil exploration and exploitation agreements. Corficolombiana (2022), Fedesarrollo (2021), and the Colombian Oil and Gas Association (2022) find that Colombia would face larger external and fiscal deficits. Likewise, they point out that Colombia would lose its energy sovereignty by 2027.

To sum up. There are two types of investigations related to post-extractivism: theoretical research and econometric studies. In the first category, scholars analyse the extractive model's features and the financial system's challenges in reducing environmental damage. Nonetheless, few investigations consider external restrictions as the main issue to unburn fossil fuels. In the second category of investigations, the authors analyse the impacts of stranding fossil fuels. Most of this research considers equity aspects concluding that countries in the south face more limits in reducing fossil extraction. Only three investigations are analysing this topic considering external constraints from a heterodox perspective. Then, due to this gap, this research is important because I will contribute to the literature about post-extractivism and external restrictions from heterodox theories.

Chapter 3. Theoretical framework

Three theories frame this research. The post-Keynesianism, the development theory and the Ecological Economics school. I will explain each theory in the following section.

3.1 Financialisation and monetary system. A post-Keynesian approach

The post-Keynesian school has a heterodox approach to the economy. They argue that money is not only for transaction purposes. It has three roles; transaction, speculative and precaution (de Paula, et al., 2017; Keynes, 1936). Moreover, they point out that money is endogenous; then, the monetary markets are based on real economic performance. From this approach, the central bank faces restrictions to control monetary aggregates (Hein, 2017).

Likewise, they challenge the role of the monetary policy promoted by mainstream theory. The Post-Keynesian school criticises the idea that low inflation automatically promotes real investment. Besides, they assert that inflation is a distribution struggle instead of a monetary phenomenon (Hein, 2017). Since the economy is demand-driven, the main objective of the monetary policy should encourage real investment and the promotion of full employment instead of controlling inflation (Hein, 2017; Kalecki, 1955; Laovie, 2006). Finally, the Post-Keynesian school challenge the role of monetary policy in the economic cycle, especially, in a crisis. They argue that fiscal policy plays an important role in this situation (Barón, 2017; Hein, 2017).

Finally, the post-Keynesian theory states that the economy is in a new era named financialisation (Bonizzi, 2014; Sawyer, 2013). Financialisation is a new stage of the economy wherein the roles, institutions, and financial mechanisms increase, creating a problematic dimension of finances (Epstein, 2005). This problematic dimension is given by five features of financial capital.

First, finances have an unstable nature (Wray, 2016). Due to the procyclical behaviour of financial capital and the lack of government control, finance creates instability in the economy (Bonizzi, 2014;

Ocampo, 2018; Löscher, 2022; Stockhammer & Nikolaidi, 2017). Secondly, finance is a speculative activity. Investors are looking for the valorisation of their investments in the short term. Instead of creating wealth, investors only want to enlarge the price difference between the investment and the utility (Bonizzi, 2014). Third, the south is embedded in a financial subordination circuit (Alami, et al., 2022; de Paula, et al., 2017; Löscher & Kaltenbrunner, 2022). Post-Keynesians contend that there is a currency hierarchy in the monetary system. Then, hard currencies and powerful economies determine the stabilisation of the monetary system reducing the policy space in the south (de Paula, et al., 2017). Fourth, financial capitalists seek short-term-run profits. Thereby, companies change their economic behaviour. Instead of promoting real production, they must valorise their assets to provide profits to the stockholders (Lapavitsas, 2013). Five, the government must guarantee financial capital accumulation to keep the economy's stability. Speculation and uncertainty play a key role in investment decisions (de Paula, et al., 2017; Hein, 2017; Keynes, 1936), if financial capitalists have low expectations about the performance of the economy, they will invest in other countries generating capital outflows. Thus, governments must provide high-profit expectations to the investors to avoid instability.

Therefore, there are huge imbalances in favour of financial capital in the financialisation era. In this stage, real production is subordinated by the valorisation of financial capital (Giraldo, 2005; Krippner, 2005; Sawyer, 2013). Then, finance is not a tool to increase welfare; finance is an objective itself (Rodriguez, 2021).

Although post-Keynesianism has studied monetary policy in depth, they have not analysed some institutional and political aspects of money. To complement this approach, I will take one important idea from the French regulation school. Their authors point out that money depicts economic and political imbalances (Aglietta & Orlean, 1990; Arias Gomez, 2003). Furthermore, they argue that money is a social institution imposed by the State and validated by society (Aglietta, 1979; 1996; Lipietz, 1985).

Mixing the Post-Keynesianism and the French regulation school, it is possible to argue that there are two asymmetries in the international economy. Financial and country disparities. Related to the first one, the financial sector has economic power over the economy. If the financial sector does not work, the economy does not work. It creates a privileged position for financial capital. For this reason, the monetary policy protects finance capital accumulation through different economic measures (Bonizzi, 2014).

The second asymmetry is related to country disparities. The money hierarchy plays a crucial role in this matter. The Post-Keynesian theory states dominant currencies are located at the top of the money hierarchy like the US dollar, Euro, Renminbi, UK Pounds and others (Keynes, 1936; Löscher & Kaltenbrunner, 2022). This hierarchy determines the policy space of the countries. For example, the US dollar is the most important international reserve currency. Therefore, the federal reserve bank has more autonomy to take decisions than other monetary authorities.

What are the determinants of the currency hierarchy? The Post-Keynesian theory states that this hierarchy is based on liquidity premium, which is hedge against fundamental uncertainty (Löscher & Kaltenbrunner, 2022; Löscher, 2022). Furthermore, Post-Keynesians point out that liquidity premium has three features; the country's position in the international trade structure³, the ability to define the

³ It depends on the trade balance and the complexity of the exports (Löscher & Kaltenbrunner, 2022).

denomination of debt positions, and the convertibility of a currency (Löscher & Kaltenbrunner, 2022). A currency must accomplish these three characteristics to be at the top of the currency hierarchy.

Nonetheless, there is one concept that Post-Keynesians do not consider in this topic. The political and economic force of the government to defend its money (Alami, et al., 2022; Block, 1989). This characteristic allowed the United States to impose its money as the international reserve currency at the Breton Woods conference. Therefore, the currency hierarchy is determined by financial, economic, and political features.

The US dollar is located at the top of the currency. Thus, the whole economy depends on the dynamics of the United States. Although there are many mechanisms whereby the United States affect the global economy (Ocampo, 2018), I will study two of them: The interest rate and the US balance of payments.

The interest rate determines the profits of an investment (Keynes, 1936). Thus, investors compare their financial returns considering the yields of US assets. If the US interest rate is greater than in the south, it is more profitable to invest in US assets. This fact is more important in a recession or a crisis because capitalists will invest in the safest asset: US bonds. Therefore, the interest rate in the south must follow the US interest rate to avoid capital outflows (de Paula, et al., 2017). It will affect real investment and consumption in local economies. As a result, the south loses policy space.

Secondly, the US balance of payments affects the whole economy. If the United States has an external deficit, there will be more dollars in the global economy. However, a permanent surplus in its external sector will reduce the US dollar supply affecting international transactions. Thereby, the optimal decision is a controlled deficit in the United States. This situation is called the Triffin Dilemma (Ocampo, 2018; Sevaes, 2015). According to (Triffin, 1960; 1978), since the United States issues the international currency, a deficit in its balance of payments is necessary to keep the stability of the monetary system. Therefore, the world economy is the hostage of the economic policy and the balance-of-payments cycles in the United States (Ocampo, 2018).

To sum up, post-Keynesianism argues that in the financialisation era, finance dominates the whole economy (Bonizzi, 2014; Rodriguez, 2021; Sawyer, 2013). Likewise, their scholars point out that the asymmetries in the economy are given by the money hierarchy, which is determined by four features (Löscher & Kaltenbrunner, 2022). A country's position in the international trade structure, the ability to define the denomination of debt positions, the level of convertibility of its currency and the political force of a country.

This theoretical approach is more appropriate to analyse climate issues for three reasons. First of all, Post-Keynesians assert that monetary aspects are important to analyse the economy. While money does not exist or is exogenous in orthodox theories, in the Post-Keynesian school, money plays a vital role in the financial and economic dynamic (Barón, 2017; Hein, 2017).

Secondly, on the one hand, some heterodox schools study the disparities in the monetary system. The French regulation school focuses on a country's political power (Aglietta & Coudert, 2016), while the modern monetary theory examines monetary sovereignty considering in detail the unit of account of the economy (Kelton, 2021). Likewise, post-Keynesian theory analyses the monetary market disparities using the currency hierarchy theory. For them, real and financial variables determine the position of a currency in the hierarchy (de Paula, et al., 2017; Löscher, 2022; Löscher & Kaltenbrunner,

2022). One of the essential variables in their analysis is the external sector's performance. It is a significant advantage over the other heterodox theories because I will analyse how the external restrictions affect the post-extractive agenda in the south.

Third, the Post-Keynesian school have studied climate issues and their relationship with financial dynamics (Löscher & Kaltenbrunner, 2022) (Löscher, 2022). Other theories like the modern monetary theory and the French Regulation school, do not have a strong line of research considering ecological issues.

3.2 Theory of development

For this school, there are two types of economies. One the one hand, economies in the north with a high level of productivity, a high-level export complexity and as a result, a large economic surplus. On the other hand, economies in the periphery with a dependency on commodities. Then, these economies have a low level of productivity, a low level of export complexity, and do not generate a large economic surplus (Garcia Isaza, 2006; Prebisch, 1999).

Another important argument in this school is the role of the external sector in the development process. Using the Thirlwall law, they state that the balance of payments limits economic growth in the long term. From this perspective, an increase in demand will expand capacity growth only if demand does not affect the trade balance (Thirlwall, 2011). Therefore, demand and exports must increase to guarantee economic growth. Nevertheless, the balance of payments itself does not boost economic growth. The complexity of exports and the income elasticity of imports are crucial in this matter (Thirlwall, 2011). Although this model was formulated to understand the north, Alleyne & Francis (2008) adjusted this model to the south finding similar outcomes. Therefore, from this perspective, external restrictions⁴ limit the economic development in the south.

This model is important because the development school points out that the international trade system has a centrifugal force that promotes more benefits for the north than the south. It is due to the deterioration of the terms of trade in the south over time (Prebisch, 1986; 1999). To overcome this issue, the development theory proposes an industrialisation process to diversify the economy, boost non-traditional exports and promote economic development (Garcia Isaza, 2006; Prebisch, 1999). Development authors contend that the industrial sector is important because it has a high level of division and specialisation of labour, it allows backwards and forwards linkages, and promotes learning by doing (Dasgupta & Stiglitz, 1988; Hirschman, 1968; Smith, 2012). As a result, the industry encourages the productivity of the economy and creates a significant economic surplus (Garcia Isaza, 2006; Prebisch, 1999; van Bergeijk & Van Marrewijk, 2013).

Development scholars formulated a model to consider environmental and social aspects. This model examines three gaps in peripheries; an environmental, social and external gap (Samaniego, et al., 2022; Gramkow & Porcile, 2022). The social gap is the difference between the current base poverty rate and the millennium objective to eradicate poverty. The environmental gap is the current greenhouse gas emission and the reduction objective for 2030. Finally, the external gap depicts the insertion in the international market. A key element in this theory is that economic growth is limited

⁴ It is defined as the necessity to get hard currency to boost the economic growth (Thirlwall, 2011; Perez & Vernengo, 2020).

by external restrictions (or balance of payments constraints) (Thirlwall, 2011). From this perspective, fossil fuels create income to reduce poverty and keep the stability of the external sector. Therefore, the policy recommendation is to continue burning fossil fuels, promoting investment in clean energy and encouraging the industrialisation of the economy to diversify the export basket (Samaniego, et al., 2022; Gramkow & Porcile, 2022).

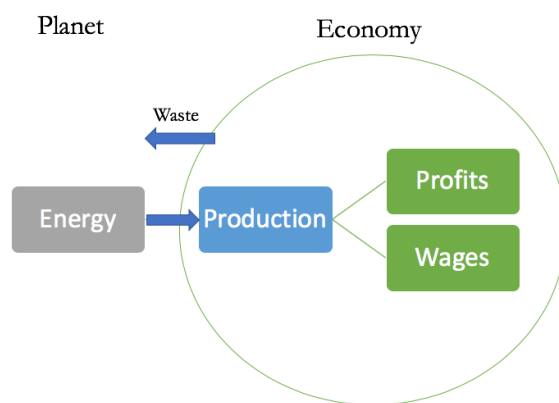
To sum up, the development school have studied the imbalance between the core and peripheries. This theoretical approach is appropriate for this investigation for three reasons. First, they examine in detail how the international dynamic and the dependency on fossil fuels create disparities in the global economy. Secondly, they investigate in detail how external restrictions affect the local economies. Third, the three gaps model provides a broad understanding of external, social, and environmental challenges.

3.3 Ecological Economics

The Ecological Economics school argues that the economy is embedded in a biophysical limit (Dietz & O'Neill, 2012). Therefore, it is impossible to understand the production, consumption, and distribution out of biophysical limits (Daly, 2005). From this perspective, the planet provides energy and materials to the economic system.

A revolutionary idea made by Lavoie and Godley is that all things in the economy come from somewhere and go somewhere (Godley & Lavoie, 2012). It helps to understand the energy circuit and the production system. For example, fossil fuels provide energy to the production process, which generates profits and wages. Nonetheless, at the same time, the economy creates waste for the planet. Figure 3 depicts this relationship.

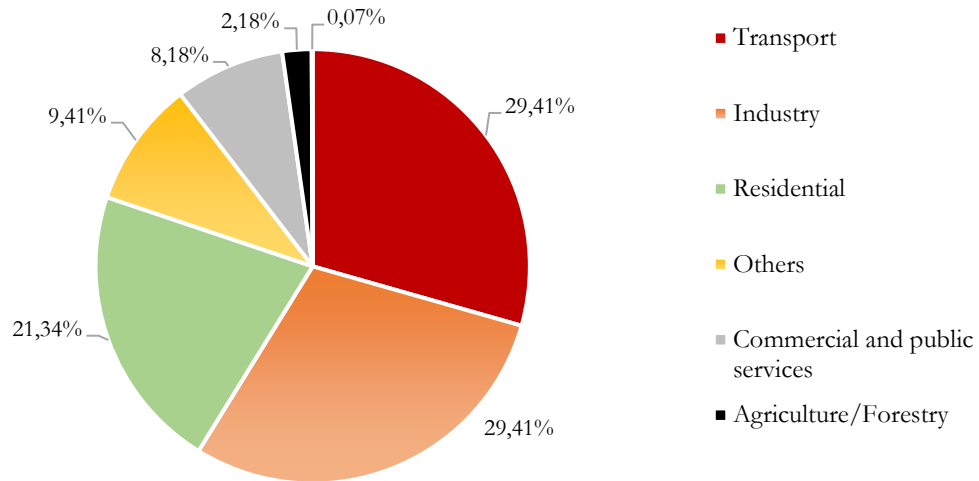
Figure 3. Relationship between the planet and the economy



Source: Own elaboration.

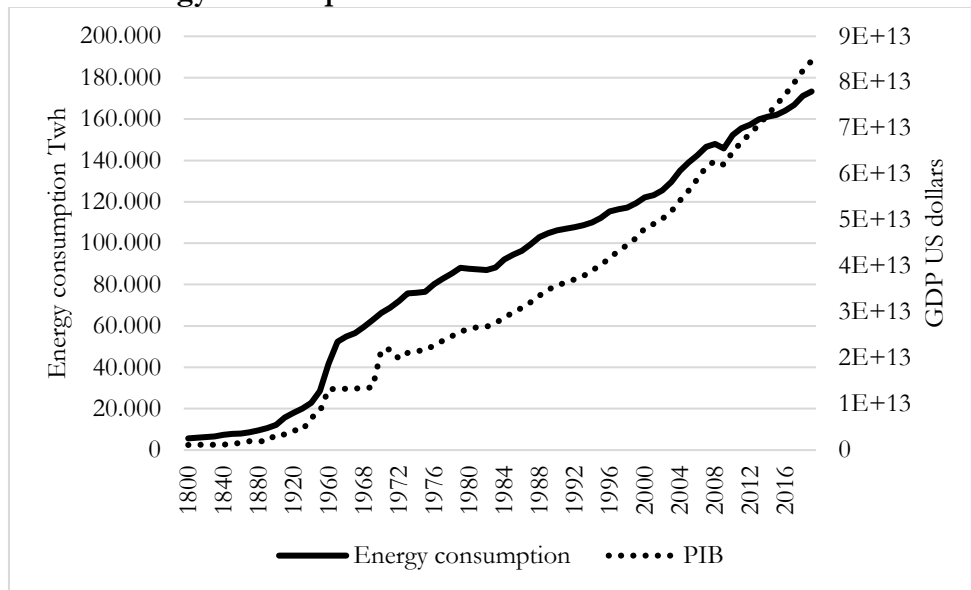
Ecological Economics school uses thermodynamic laws to explain the relationship between the economic process and planetary limits (Daly, 2005; Dietz & O'Neill, 2012). Energy can neither be created nor destroyed; energy is only converted from one form to another one. Thus, burning fossil fuels is a chemical process to convert energy for economic purposes (See figure 4 and figure 5).

Figure 4. Use of the energy worldwide 2019.



Source: (International Energy Agency, 2022)

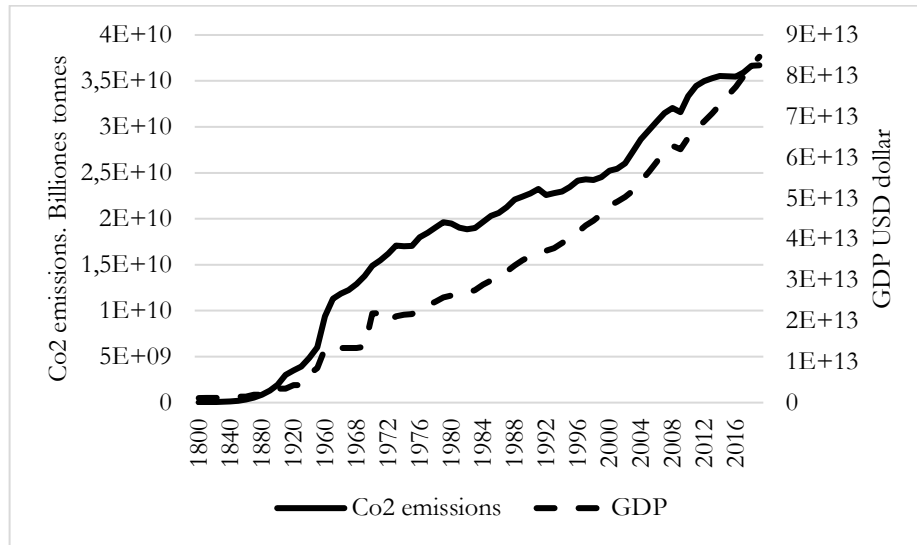
Figure 5. Global energy consumption Twh and GDP in US dollars from 1800 to 2016



Source: Own elaboration based on (Oxford University, 2020; The World Bank, 2020)

Moreover, figure 5 demonstrates that the industrial revolution increases production and energy consumption. The invention of the steam machine raised productivity because it created more output with the same input. Notwithstanding this fact, the industrial process needed more energy. Then, coal and oil were used to provide energy for this process. As a result, energy consumption increases faster than before. However, it generated more greenhouse gases emission. Figure 6 shows the relationship between GDP and emissions. Therefore, the industrial revolution raised production, energy consumption and greenhouse gases emission.

Figure 6. Co2 Emissions billions of tonnes and GDP USD dollars for the world. 1800-2019



Source: Own elaboration based on (Oxford University, 2020; The World Bank, 2020)

Therefore, from this approach, the environmental damage is caused by the economic system. Thus, it is necessary to change the economy to solve the climate crisis (Daly, 2005; Dietz & O'Neill, 2012).

Chapter 4. Post-extractivism

There is a debate about capitalism and environmental protection. Some scholars contend that green growth is feasible because capitalism creates technology and solutions to environmental problems (IMF, 2008; Speth, 2008; Stern, 2007; World Bank, 2008). On the other hand, some heterodox authors argue that capitalism has to be reformed radically to reduce environmental impacts (Acosta, et al., 2016; Dietz & O'Neill, 2012; Gerber & Raina, 2018; Latouche, 2008).

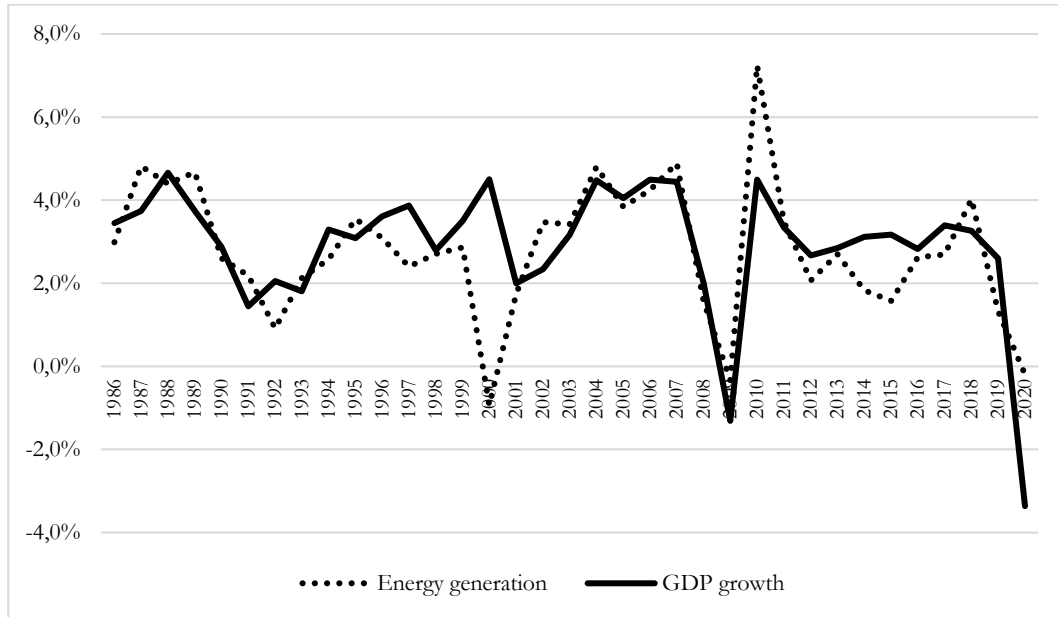
Within heterodox theories, post-extractivism is a Latin American school influenced by Ecological economics and development theory. They support supply-side policies to reduce environmental damage. Their main policy recommendation is to avoid fossil fuel extraction. However, they argue that this policy is feasible if there is a radical transformation of the economic system (Acosta, 2016; Gudynas, 2011).

This school has four important ideas: environmental protection is not possible within capitalism, capitalism cannot work without fossil fuels, extractivism is a rentier activity, and dependency on fossil fuels creates a financial subordination (Acosta, 2016; Gudynas, 2011; 2015). In the following section, I will explain each idea in detail.

First of all, environmental protection is not feasible within capitalism. It is because capitalism is based on capital accumulation without limits. Nonetheless, the planet has boundaries (Daly, 2005; Dietz & O'Neill, 2012; Storm, 2009; Latouche, 2008)

Secondly, capitalism cannot exist without fossil fuels. As I showed before, energy is essential because all economic activities need energy. Therefore, there is a positive relationship between energy generation and economic production. Figure 7 depicts this relationship. As a result, without energy, there is no economic growth.

Figure 7. Growth of world energy generation and GDP growth. 1986-2020.



Source: (Our world in Data, 2020; World Bank, 2022)

Albeit some authors argue that it is possible to replace fossil fuels using renewable energies, they assume that renewable energy is powerful as fossil sources. Nevertheless, there is not enough evidence of this fact (Storm, 2009). Figure 2 demonstrates that renewable energy cannot transmit the same energy as fossil fuels (U.S Energy information administration, 2021). Thereby, if renewable sources do not have the same power, and due to the positive correlation between energy and production, an economic system based on renewable sources will reduce its production. Then, capitalism is not feasible without fossil fuels.

Third, extractivism is a rentier activity (Acosta, 2016; Gudynas, 2011; 2015). Garcia Isaza (2006) found that the most productive economies are based on activities with a high-level division and specialisation of labour. It is important because it creates a large economic surplus which promotes re-investment, exports and economic growth. However, economies with a fossil fuel extraction dependency are not characterised by a high level of division and specialisation of labour. Therefore, countries with a fossil dependency do not produce a significant economic surplus which plays a vital role in the development process (Garcia Isaza, 2006).

Fourth, due to the Prebisch-Singer condition, countries with a dependency on commodities will run a permanent trade deficit (Acosta, 2016). It is important because it affects the economic growth (Prebisch, 1999; Thirlwall, 2011) and the policy space (Löscher & Kaltenbrunner, 2022).

To sum up, the post-extractive school states that fossil fuels are a necessary condition for capitalism. Thus, environmental protection is not feasible within this economic system (Acosta, 2016;

Gudynas, 2011; 2015). Therefore, unburning fossil fuels imply a radical change in the economic system. It means that a post-extractive policy is only possible within a post-capitalist economy.

4.1 The stages of post-extractivism

The main argument of post-extractivism is that all countries should strand fossil assets and promote changes in the economic system to reduce environmental damage. Nonetheless, this school recognises that countries have different roles and responsibilities in reducing environmental damage. The global north should reduce faster its extraction of fossil fuels than the south (Acosta, 2016). Likewise, within the south, there are different responsibilities. Countries with a dependency on oil like Colombia and Ecuador cannot formulate the same policies as countries that extract lithium or copper like Bolivia and Chile.

Moreover, although post-extractivism supports a new economic system in the long term, there are some intermediate steps (Gudynas, 2015). Then, there are two stages of development towards a post-extractive society.

a) Sensible extractivism.

The main element of this stage is that the government would optimise fossil fuel extraction to reduce the economic, environmental and social impacts (Gudynas, 2011; 2015). Instead of boosting extraction activities, governments will create different instruments to keep them unburnable. For instance, they will promote debt swaps, moratoria, and export taxes. One important proposal is that governments will not extract fossil fuels in strategic ecosystems. In this way, Pellegrini, et al. (2021) have formulated an inverse auction to compensate for the lack of income that countries will not receive if they strand fossil assets.

Concerning current extractions, governments will create better instruments to evaluate the environmental impact of extractive activities. Likewise, the government will cut all subsidies, and if it is possible, governments will nationalise these firms (Acosta, 2016; Gudynas, 2015).

Finally, the post-extractivism school states that it is necessary to reform the price formation of fossil fuels. They contend that the prices should consider environmental and social impacts (Acosta, 2016).

b) Indispensable extractivism

This stage is similar to the "Buen Vivir" proposal, which promotes a post-development agenda. In this stage, the economic, social and political structure should change (Acosta, 2016; Gudynas, 2015). Nonetheless, Gudynas (2011) points out that a new development model cannot stop burning fossil fuels. Then, in a post-extractive society, the extraction of fossil fuels will be minimised to solve the population's necessities instead of promoting capital accumulation.

Chapter 5. Challenges of post-extractivism

Post-extractive authors have studied economic, social, and political phenomena. Gudynas (2019) studies the relationship between post-extractivism, "buen vivir", and post-development theory. Riofrancos (2020) analyses some political issues related to extractivism and post-extractivism. Acosta & Cajas (2020) investigate the relationship between the extractive model and democracy. Other authors have studied the link between corruption, illegal activities, and extractivism (Gudynas, 2017a) (Gudynas, 2018). Likewise, some scholars analyse environmental conservation, globalisation and democracy (Gudynas, 2016). Moreover, there is literature that studies post-extractivism in Perú (Alayza & Gudynas, 2011) and Paraguay (Gudynas, 2017). Finally, there is a huge amount of literature related to the Yasuni initiative⁵ (Bucamaram, et al., 2017; Finer, et al., 2010; Larrea & Warnars, 2009; Rival, 2010; Vallejo, et al., 2015).

Nevertheless, post-extractive scholars have not studied macroeconomic issues. There are some investigations about this matter (Sotelo & Francke, 2011; Löscher & Kaltenbrunner, 2022; Löscher, 2022; Aguila, et al., 2022; Aglietta & Coudert, 2016; Gramkow & Porcile, 2022; Samaniego, et al., 2022), but there is not a complete research line of macroeconomics and post-extractivism considering external constraints. Thereby, this investigation will study in detail the macroeconomics and financial challenges of the post-extractive agenda giving a special analysis of external constraints.

Post-extractivism agenda has at least two critical challenges. First, fossil fuels provide energy for the production process. As I said before, energy and production have a positive relationship. Moreover, fossil energy is more energy efficient than renewable sources. Then, a reduction in the extraction of fossil fuels will affect economic growth. How can capitalism work if there is a limit on economic growth?

Secondly, fossil fuels provide US dollars to local economies in the south. If governments strand fossil assets, the south will face an external crisis. Sotelo & Francke (2011) studied this scenario in Peru. They analyse three post-extractive scenarios considering macroeconomic aspects.

1. What would have happened if Peru had stopped the whole extraction of oil and gas?

They found that there would have run a larger external and fiscal deficit. The central bank would have had to decumulate reserves to avoid a more significant external deficit.

2. What would have happened if Peru would not start new extractions?

Although the results are similar to the first scenario, the scenario is less adverse, and the crisis would have taken more time to emerge.

3. Finally, they analysed the second scenario but studied additional taxes for extraordinary profits in the mining sector.

They concluded that Peru would have run a small change in their external and fiscal deficit.

⁵ It was a project to avoid oil extraction in the Ecuadorian amazon. Although the Ecuadorian government tried to not extract oil there, due to the lack of income compensation, the government had to extract oil in this part of the Amazon.

Even though it was a static exercise, this analysis demonstrates the effects of unburning fossil fuels on external and fiscal deficits in the short term. In the next chapter, I will analyse the mechanisms whereby external restrictions affect post-extractivism policies.

5.1 Prebisch-Singer condition, money hierarchy and post-extractivism

Four features determine the position of a country in the currency hierarchy; a country's position in the international trade structure⁶, the ability to define the denomination of debt positions, the level of convertibility of its currency and the political force of a country (Löscher & Kaltenbrunner, 2022) (Block, 1989). However, the most important feature is its position in the international market.

The development theory argues that countries fossil dependent tend to have a deficit in their trade balance (Garcia Isaza, 2006; Prebisch, 1986; 1999; Samaniego, et al., 2022). In accountability, the asset of an agent is the liability of another one. Using this concept, the external deficit of a country is the surplus of another one. In a simple model with two countries, the country α represents an economy of the north with an industrial sector, a large economic surplus, and a positive trade balance. On the other hand, the country β is an economy from the south which is fossil-dependent, without a significant economic surplus, and a trade deficit. Since β has a deficit, another country has a trade surplus (Country α).

Equation 1. Net trade in economy β

$$\text{Exports from } \beta - \text{Imports from } \alpha = \text{International net trade } \beta = \text{Deficit } \beta$$

Equation 2. Net international trade in economy α

$$\text{Exports from } \alpha - \text{Imports from } \beta = \text{International net trade } \alpha = \text{Surplus } \alpha$$

Equation 3. International balance

$$\text{Deficit } \beta = -\text{Surplus } \alpha$$

The Surplus α will be invested in β using different instruments like debt, foreign investment, portfolio, and others. β will use this money to cover its external deficit. Therefore, β has a dependency on the flows from the economy α . It creates a double benefit for α . Its currency is accepted in other economies and α can denominate the debt positions of β . Then, α will have a strong position in the financial sector and its currency will be called hard currency⁷.

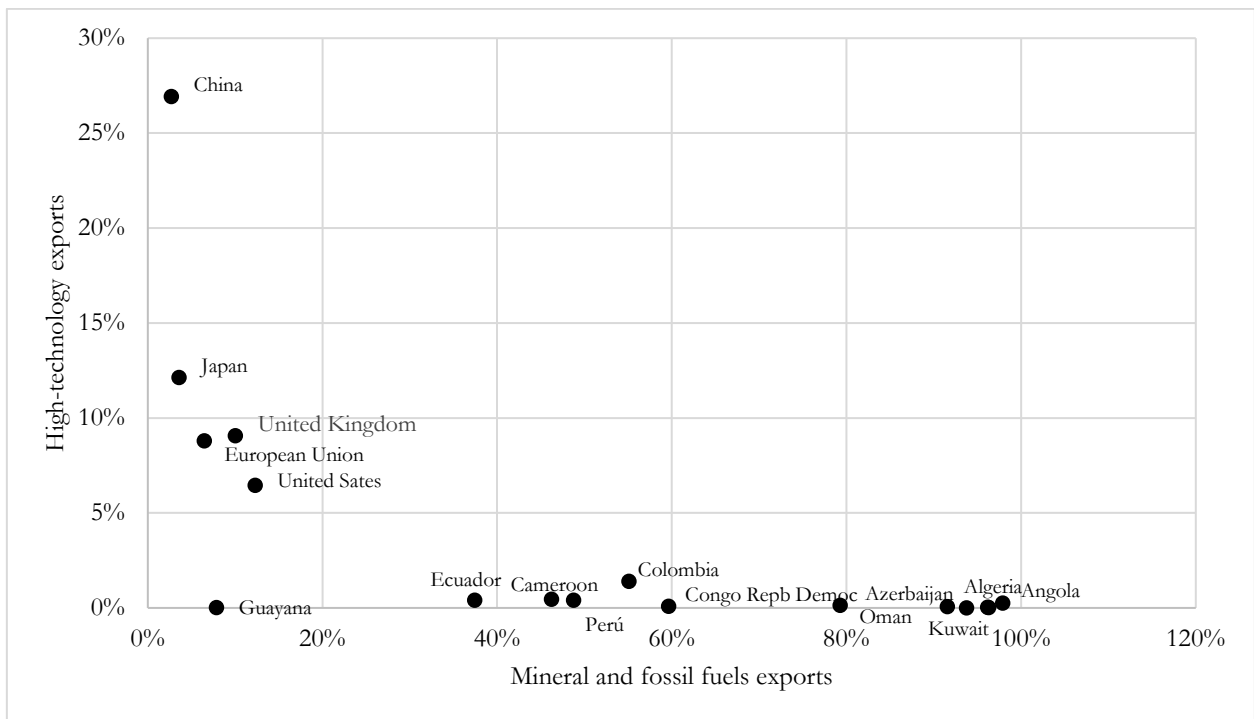
⁶ The position in the international trade structure is determined by the trade balance and the export complexity.

⁷ Nowadays, the US dollar, euro, yen, pounds and remimbi are hard currencies.

From this approach, economy α is located at the top of the currency hierarchy because this country accomplishes most of the requirements proposed by (Löscher & Kaltenbrunner, 2022). α has a strong position in the international market, its currency is globally accepted, and it can denominate the debt positions of other economies.

Thereby, countries in the north that export complex goods create an economic surplus, allowing them to have a strong position in the international market (Positive trade balance and/or complex exports). As a result, these countries are located at the top of the currency hierarchy. On the other hand, economies with a fossil fuel dependency are at the bottom of the money hierarchy because they tend to have a permanent external deficit, and their exports are not complex (García Isaza, 2006; Prebisch, 1986; 1999; Samaniego, et al., 2022). Figure 8 depicts this relationship. Economies with hard currencies like China, Japan and the United States export complex goods, whereas countries with a fossil fuel dependency do not have a high level of export complexity.

Figure 8. High-technology exports as % of final exports vs mineral and fossil fuels exports as % of final exports



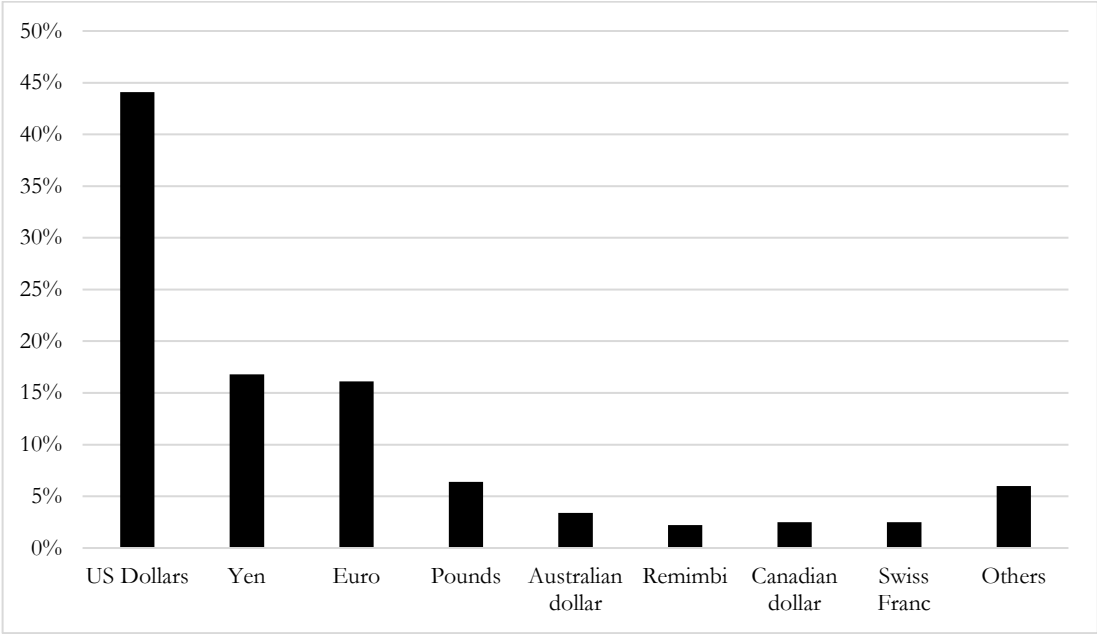
Source: Own elaboration based on (World Bank, 2022)

This currency hierarchy is important because it provides policy space to the governments. Then, countries located at the bottom of the hierarchy have more limits to formulate some policies than countries with hard currency located at the top of the hierarchy (Alami, et al., 2022; Löscher, 2022; Löscher & Kaltenbrunner, 2022).

From this approach, the policy space is given by the possession and control of hard currencies. Countries without the possession of hard currencies will have economic and financial issues. Figure 9 depicts that most international transactions are made in US dollars, Yens and Euros (Bank of

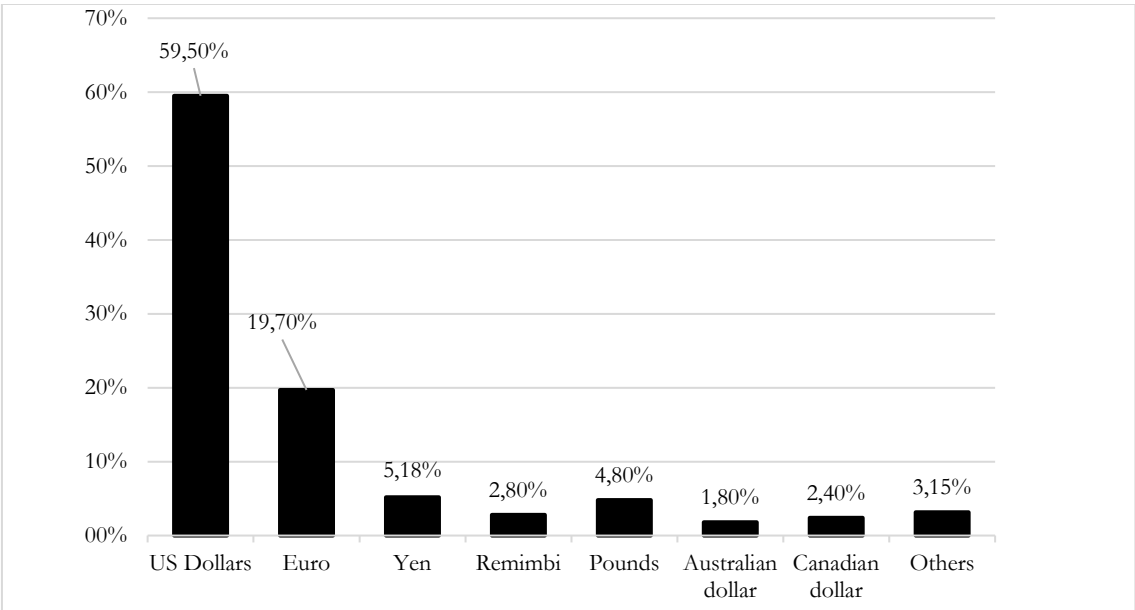
international settlements, 2019). Likewise, figure 10 demonstrates that most of the international reserves are denominated in USD dollars, Euros, and Yens (IMF, 2022).

Figure 9. Denomination of international transactions



Source: (Bank of international settlements, 2019)

Figure 10. World reserves by currency 2022



Source: (IMF, 2022)

Therefore, if a country does not hold hard currencies, it will face economic and financial instability. The economic instability is caused by the difficulty in trading in the international market. It is essential because the south is a net importer of capital goods (García Isaza, 2006). Then, the shortage of hard currency depreciates the exchange rate and affects capital imports creating higher costs⁸, and inflation.

Moreover, the lack of hard currency generates financial stability. The financialisation theory asserts that finance is procyclical and financial capitalists are speculative (Bonizzi, 2014). If a policy affects economic expectations, financial capitalists would rather invest their capital in other economies, creating capital outflows. Furthermore, the shortage of hard currency reduces the country's international reserves. It is important because international reserves are a kind of macroeconomic insurance which protect the local economy from financial imbalances. Then, a reduction of international reserves will impact the economic expectations of financial investors. It will reinforce capital outflows and the depreciation of the local currency affecting some financial indicators. External debt will be more expensive, the country's risk will be higher, and the economy will face higher interest rates to take a new public debt (Calvo, 1998).

Countries must get hard currency and keep their deficits under control to avoid this situation, (Calvo, 1998). This policy recommendation is important because the ways to get hard currency will reduce the policy space in the south. In the following section, I will demonstrate the relationship between policy space and the strategies to hold hard currencies. There are four ways to get hard currency⁹.

To begin with, foreign investment. It is an important tool to expand the hard currency supply. Nonetheless, there are two challenges related to this matter. First, the most profitable activities in the south are related to minerals and fossil fuels. Hence, an important part of foreign investment encourages the extraction of fossil fuels. It will not reduce external constraints because it will reinforce its dependency on the mining and hydrocarbon sector (Ghosh, 2011; Kalecki, 1955). Secondly, the south has to formulate different policies to attract foreign investment. However, these policies could reduce the economic policy space (Löscher & Kaltenbrunner, 2022). For instance, lower corporate taxes diminish fiscal revenues and affects public expenditure. Therefore, governments will not have enough budget to solve local issues reducing its local policy space.

Secondly, capital inflows. Capital flows are procyclical and affect the stability of local economies (Bonizzi, 2014; Ocampo, 2018; Stockholm Environment Institute, 2016). It creates financial instability and Ponzi external structures (Wray, 2016). This strategy will reduce policy space for the government because currency speculation creates volatility in their exchange rates (de Paula, et al., 2017; Löscher & Kaltenbrunner, 2022). Thereby, governments must control the exchange rate and avoid capital outflows affecting the formulation of some policies to solve local problems. For example, if the US sets a high interest rate, central banks in the south must set a higher interest rate to avoid capital outflows (Ocampo, 2018). Thus, the monetary policy focuses on controlling capital outflows instead of reducing local unemployment and boosting economic production.

Third, exports. It is the best option to deal with external restrictions because it will create economic benefits for the society like fiscal revenues, employment, and promotion of other economic sectors

⁸ The Post-Keynesian theory argues that inflation is a distribution struggle, therefore, to keep constant their profits, firms will rise prices (Hein, 2017).

⁹ I will omit remittances and international funding because they are not a stable flow. Moreover, they are not related directly with the local performance of the economy.

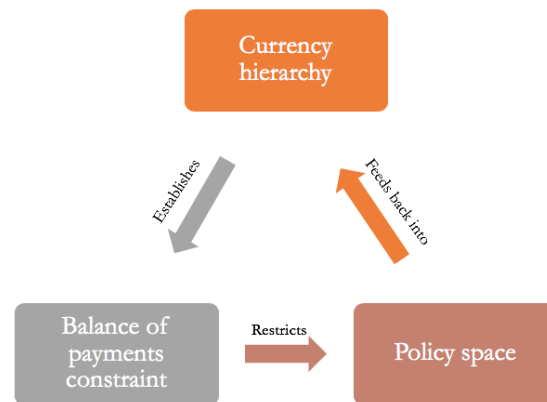
(Garcia Isaza, 2006; Ghosh, 2011; Prebisch, 1999). Nonetheless, the south has many challenges in promoting non-traditional exports. First, a commodity boom affects non-traditional exports due to the Dutch disease. Secondly, peripheries face the volatility of the commodities prices and the deterioration of terms of trade (Löscher & Kaltenbrunner, 2022). Third, it is difficult to promote non-traditional exports following the Washington consensus. Chang (2003) has demonstrated that countries that have diversified and industrialised their economies have formulated non-orthodox policies to boost their external sector. Fourth, it is necessary to adopt new technology to promote non-traditional exports, but the south has a technological dependency on the north (Garcia Isaza, 2006; Prebisch, 1986). Five, a significant investment is needed to trigger exports without affecting local production (Kalecki, 1955). Finally, the promotion of non-traditional exports takes time. Therefore, although countries can export industrial goods in the medium term, extracting more commodities is the more straightforward solution for the south to boost exports in the short term. As a result, these economies will not change their position in the international market. Then, their currency will continue at the bottom of the currency hierarchy reducing their policy space.

Fourth, external debt. One of the most important challenges is that external debt creates a vicious circle because countries must encourage their traditional exports and promote capital inflows to pay the external debt in the future. Moreover, this strategy depends on global liquidity (Kalecki, 1955). If the global economy is illiquid, countries in the south must pay a high-interest rate affecting debt sustainability (Reinhart, et al., 2003).

To sum up, countries with a dependency on fossil fuels do not have a strong position in the international trade structure. Then, their currencies are located at the bottom of the currency hierarchy. Due to this position, these economies face external constraints, which affect their policy space.

It creates a challenge for the south because there are fewer instruments and policies to promote the diversification of the export basket. Thus, countries will continue with a large external deficit that reinforces their low position in the money hierarchy. This phenomenon is called financial subordination (Alami, et al., 2022). Due to the low position in the currency hierarchy, the autonomy of macroeconomic policies is challenged by the international financial dynamic.

Figure 11. A schematic representation of the mechanisms behind financial subordination.



Source: (Löscher & Kaltenbrunner, 2022)

5.1 External restrictions and post-extractivism agenda

If a country in the south strand fossil assets, there will be a negative impact on the US dollar¹⁰ supply. It will reduce exports and foreign investment related to fossil fuels. This situation was analysed in the Peruvian case by (Sotelo & Francke, 2011). They found that Peru would have faced larger fiscal and external deficits if they had stopped their fossil extraction.

Therefore, a reduction in fossil fuel extraction will create economic instability in three ways. First, the depreciation of the exchange rate affects the imports of intermediate goods. As a result, it generates higher costs and inflation pressure. Secondly, countries will run a larger external deficit that will reduce their policy space in the future. Third, it will affect the economic expectations of investors.

Moreover, the reduction of fossil fuel extraction depends on global dynamics in two ways. First, the financial cycle. In chapter 3, I said that all economies are hostage of the US economic policy (Ocampo, 2018). Higher interest rates in the United States will produce global illiquidity, which tends to depreciate the exchange rate in the south. If countries do not export fossil fuels in this situation, the depreciation will be more significant. Secondly, a few powerful countries determine international prices of fossil fuels. The south is a price-taken agent. If prices are low, the extraction is less profitable, and it is possible to strand assets. Nevertheless, if prices are high, countries will receive more income, and there will be fewer incentives to stop fossil fuel extraction.

Then, external restrictions limit the post-extractive agenda in the south. Since the south cannot reform the monetary system, peripheries must choose between environmental protection and financial stability.

These impacts are considered in the three gaps model. This model examines environmental, social and external gaps (Samaniego, et al., 2022; Gramkow & Porcile, 2022). Based on the Thirlwall law, their authors argue that external restrictions limit the development of the economic structure in the south. It is because economies with a dependency on commodities do not create an economic surplus

¹⁰ Although there are at least five hard currencies in the economy, I will use hard currency as a synonym of US dollar because most of the fossil fuels are traded in the US dollar.

and they run a permanent external deficit. In this model, authors include environmental and social aspects to have a multidisciplinary approach to the problem. For them, the south needs to close the external gap to boost economic growth, reduce poverty and adapt the economy to climate change.

The policy recommendation of the three gaps model is to continue exporting fossil fuels and use hard currencies to industrialise the economy. It will create an economic surplus, boost economic growth and it would allow these economies to have a better position in the international trade market. Likewise, governments should invest in renewable energies and Research and Development to reduce greenhouse gas emissions (Samaniego, et al., 2022; Gramkow & Porcile, 2022).

Chapter 6. The Colombian case

The Colombian government is promoting the post-extractive agenda. The Colombian president, Gustavo Petro, won the elections in July 2022 with an environmental discourse. In his programme, he stated that the government would discourage the extractivism model (Pacto Histórico, 2022).

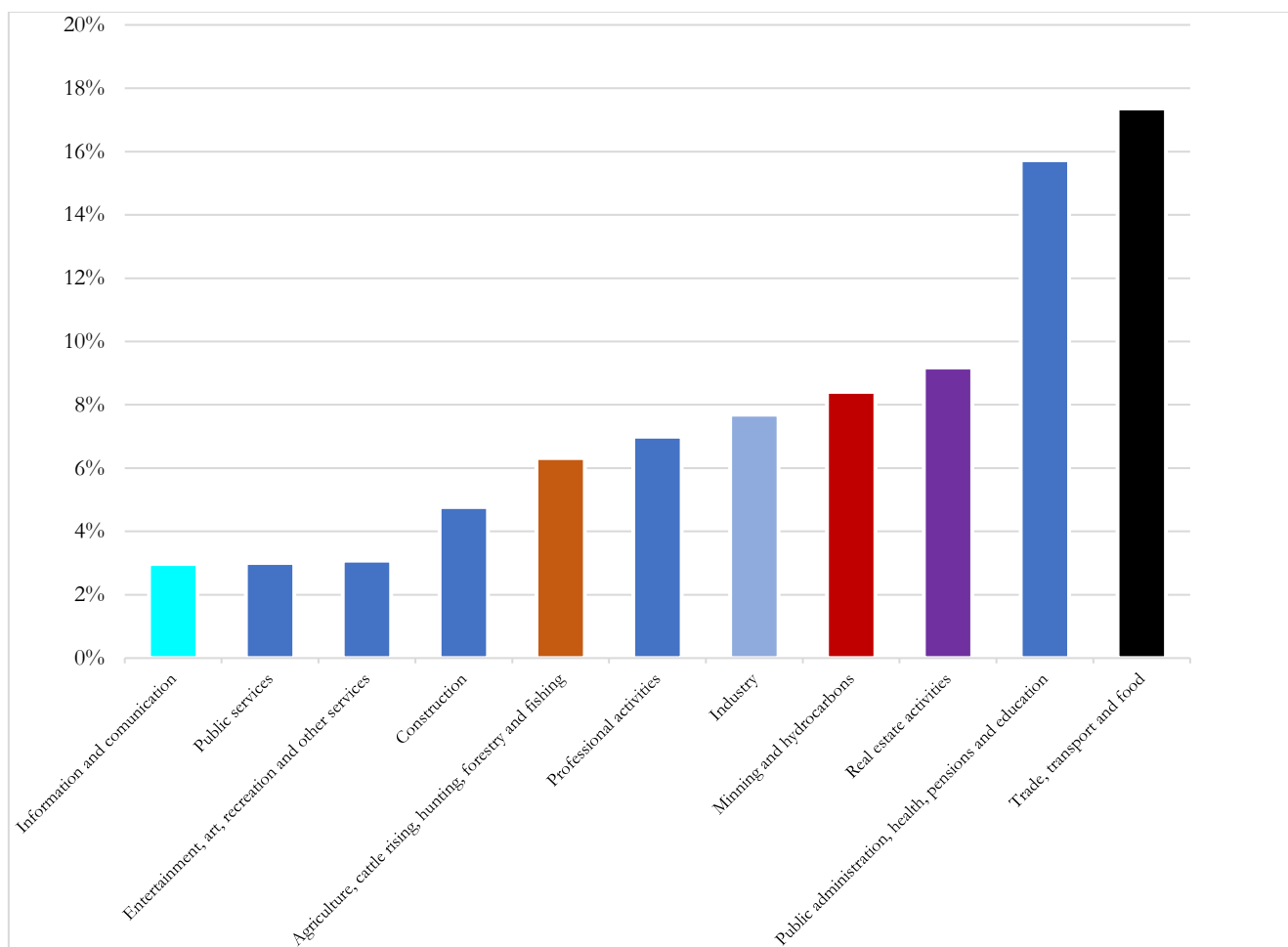
In his first speech as president, he said climate change was the most dangerous threat to our lives (Petro, 2022). Thus, he would promote the economic and energy transition (Petro, 2022a). In this way, the Minister of Finance has formulated two economic policies to encourage the transition. Likewise, the Minister of Mines and Energy had announced that the government would not sign new oil exploration and exploitation agreements in Colombia (Silla Vacía, 2022).

Although the government promotes a post-extractive agenda, the Minister of Finance and some think tanks have argued that many factors limit the transition. One of these issues is external restrictions (Corficolombiana, 2022; Fedesarrollo, 2021; Semana, 2022). Then, Colombia is a good example of how external restrictions affect post-extractive policies.

6.1 Colombian context

Colombia is a peripheric economy located in south America. It is a middle-income economy based on low-complex activities. Although Colombian governments have promoted oil extraction to develop the economic structure (Palacios, 2003), the mining and hydrocarbon sector is not the most important activity in the final production.

Figure 12. Participation of different economic sectors in the Colombian GDP in constant currency terms, 2021.



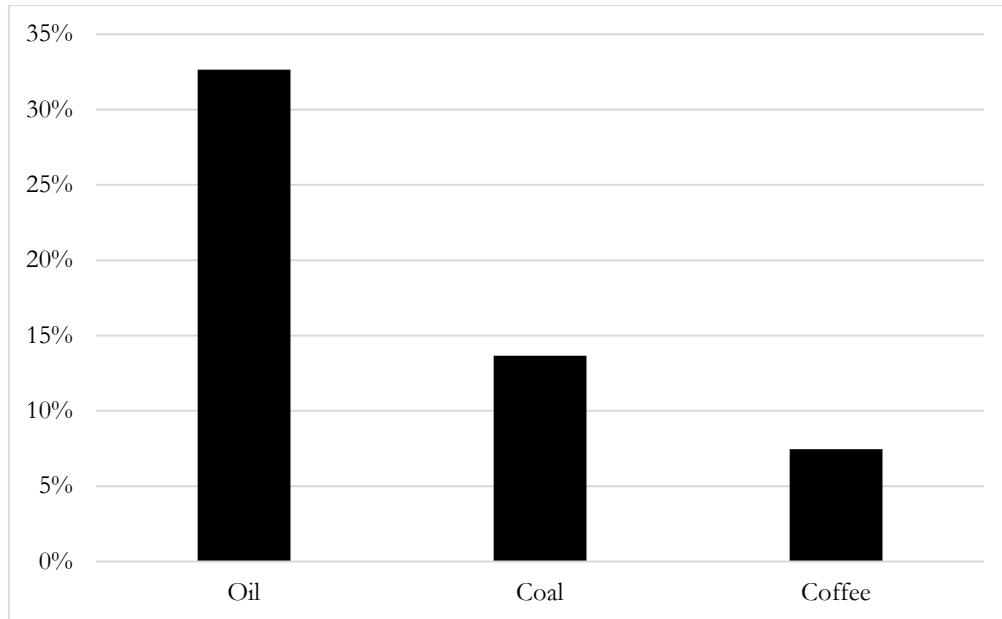
Source: (Dane, 2022)¹¹

Nonetheless, fossil fuels play a crucial role in fiscal policy and the external sector. Fiscal revenues from the oil and gas sector represent 4.5% of the GDP and 17% of the national government's revenues (Colombian Oil and Gas Association, 2022). Likewise, in royalties, this sector contributes in 1,3 USD billion per year, which is an essential income for sub-national governments (Agencia Nacional de Hidrocarburos, 2022). It is important because higher oil prices will increase fiscal expenditure allowing to finance more public policies.

Not only are fossil fuels important for fiscal policy, but also, they are vital for the external sector. 46.3% of exports come from the oil and coal sector, and 29.4% of the foreign investment is related to fossil fuels (Banco de la República, 2022; Dane, 2022).

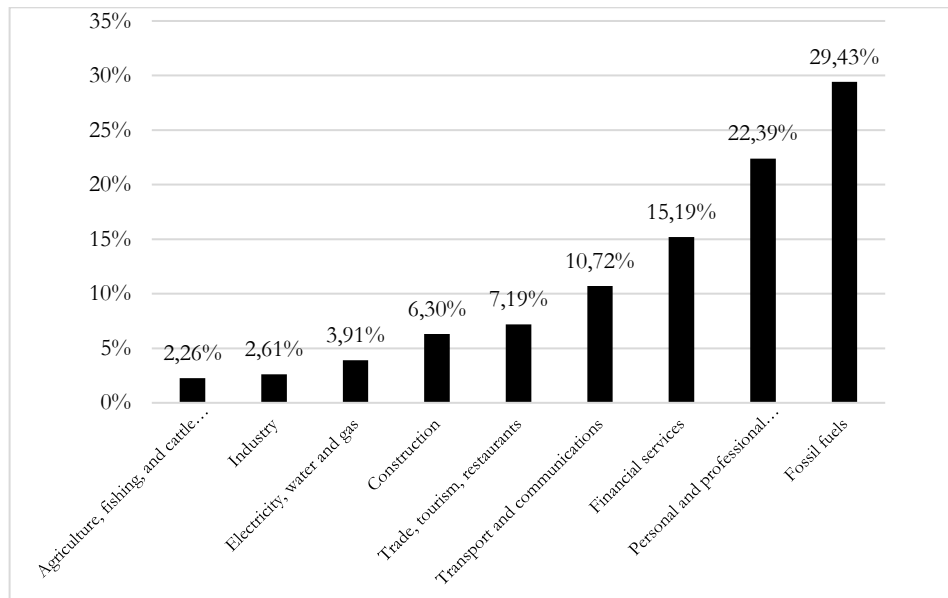
¹¹ The government includes refinery activities in the industrial sector. However, refinery should be counted as part of the mining and hydrocarbon sector.

Figure 13. Three principal export goods in Colombia in 2021



Source: (Banco de la República, 2022)

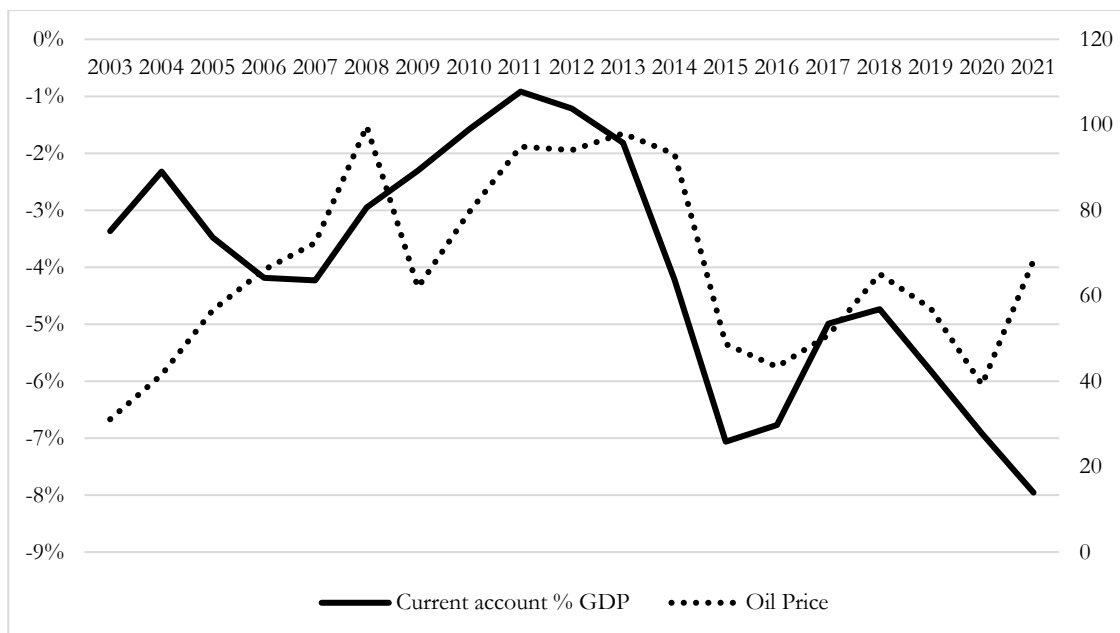
Figure 14. Foreign investment in Colombia per economic activity in 2019



Source: (Banco de la República, 2022)

Therefore, the external sector depends on the fossil fuels dynamic, especially, in the oil sector (Rodríguez, 2021). Figure 15 depicts that higher oil prices reduce the current account deficit.

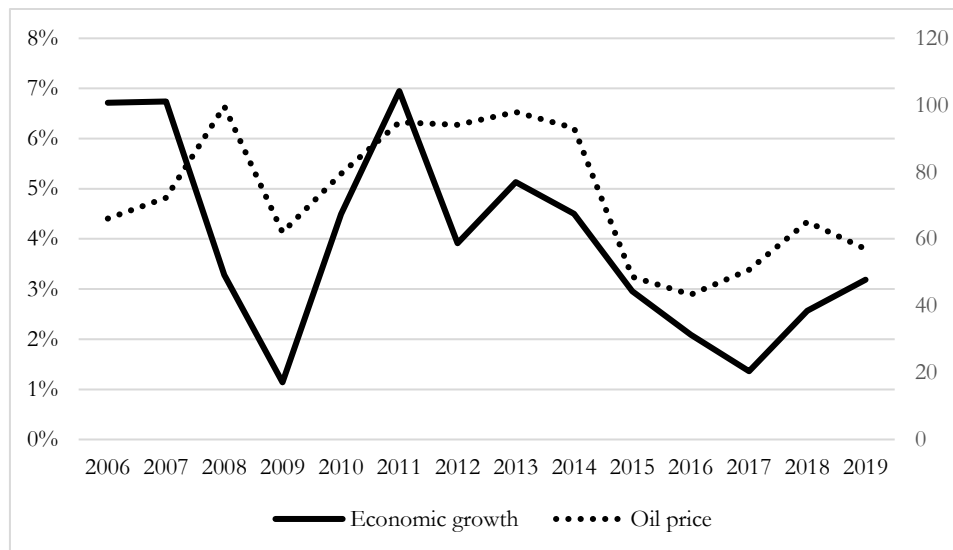
Figure 15. Current account balance as part of the GDP and oil prices 2003-2021 for Colombia



Source: (World Bank, 2022; U.S Energy Information Administration, 2022)

The oil price impacts economic growth via the exchange rate. A high oil price will appreciate the exchange rate reducing external debt/ratio. It allows to expand the public expenditure and boosts the economy. Furthermore, since 80.5% of imports are intermediate and capital goods (Dane, 2022), production will be cheaper due to the appreciation of the exchange rate. Therefore, oil prices and economic growth have a positive correlation (See figure 16).

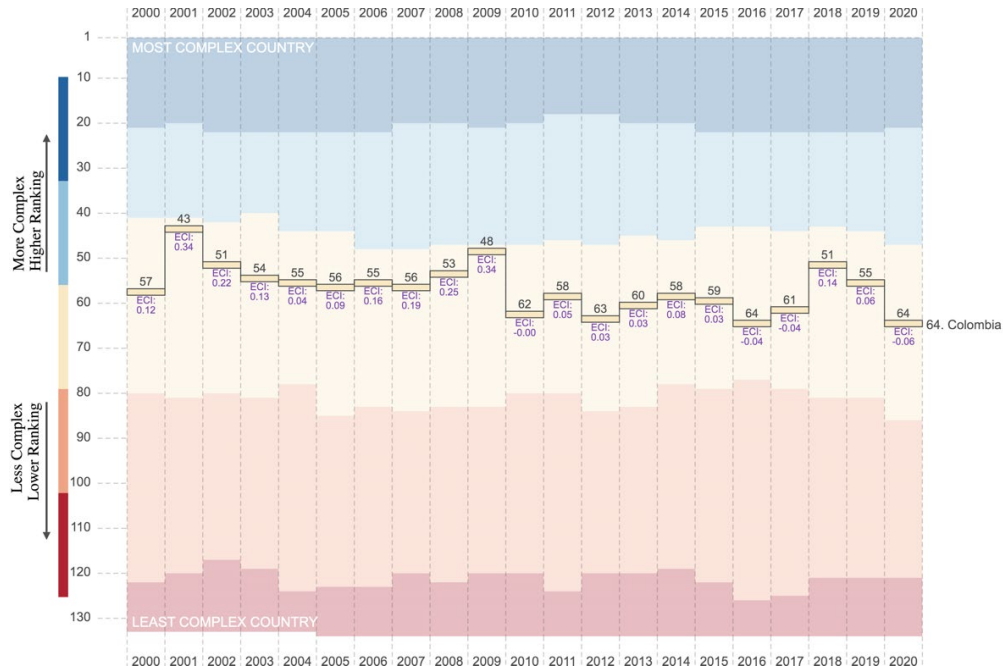
Figure 16. Oil prices and Colombian economic growth.



Source: Based on (Banco de la República, 2022; U.S Energy Information Administration, 2022)

Due to this economic dependency on the oil sector, Colombia is located at the bottom of the currency hierarchy. It is because the trade balance of Colombia is negative (See figure 15), and its exports are not complex (See figure 17).

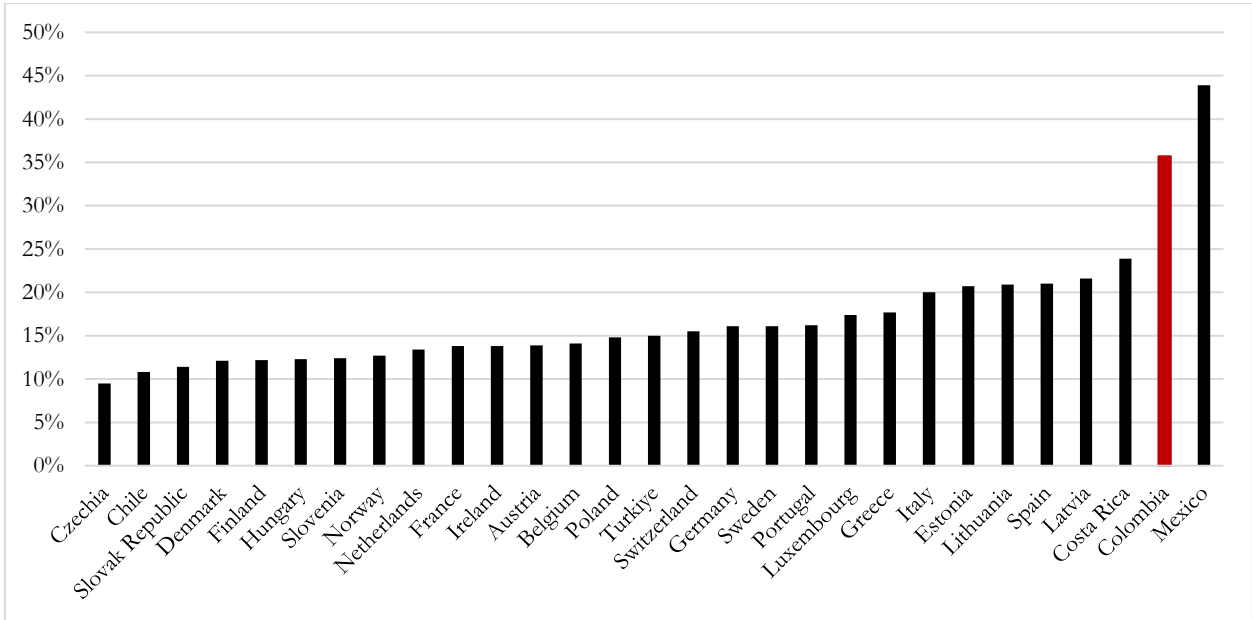
Figure 17. Complexity export 2002-2020 for Colombia



Source: (Harvard University, 2022)

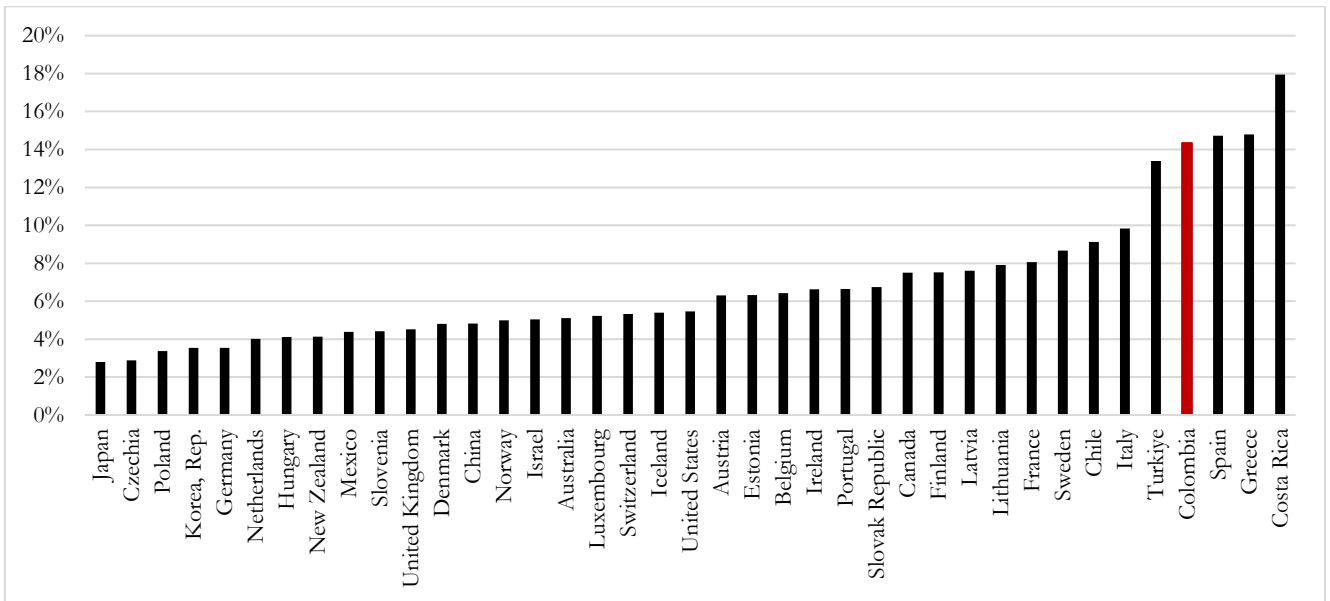
Another important fact related to the oil dynamic is that this sector is crucial to solve Colombian socioeconomic challenges. Colombia is facing a social crisis, 35% of its population lives under the poverty line (World Bank, 2022). Moreover, Colombia has one of the highest unemployment rates among OECD members as depicted in figure 19. Then, income generated by the oil sector plays an important role to solve these socioeconomic problems.

Figure 18. The poverty rate for OECD countries 2020



Source: (World Bank, 2022)

Figure 19. Unemployment rate for OECD countries 2021



Source: (World Bank, 2022)

To sum up, the Colombian economy has dependency on the oil dynamic. Due to its weak position in the international market, the Colombian peso is at bottom of the currency hierarchy.

6.2 Post-extractive policies in Colombia

In July 2022, Gustavo Petro won the presidential elections using an environmental discourse. He proposed that the economy should make a transition to a non-extractive model. Likewise, in the campaign programme, he says that the government would ban fourth activities; fracking, offshore extraction, new oil exploration agreements, and open-cast mining (Pacto Histórico, 2022). Nowadays, the government has formulated two policies to encourage the economic and energy transition.

To begin with, the government argued that it will not allow the extraction of fossil fuels from environmental protected areas (Semana, 2022). Likewise, it would not sign new oil exploration and exploitation agreements to reduce ecological impacts¹² (Silla Vacía, 2022; W Radio, 2022).

Secondly, the government has formulated a tax reform setting higher taxes for mining and hydrocarbon companies using three mechanisms.

First, the government tried to implement the Daly-Correa tax¹³. Nonetheless, due to the lobby and political pressure of oil companies, the government had to change this tax by a higher profit tax rate for these corporations (Ministerio de Hacienda y Crédito Público, 2022).

Secondly, a modification in royalties. Royalties are compensations that companies pay to extract raw materials (Constitucion Política de Colombia, 1991). Before 2022, firms could deduct the paid royalties from their profit tax value. As a result, mining and hydrocarbon companies did not pay 1.2 USD billion per year (Rudas, 2017). In article 12 of the tax reform, the government eliminates this benefit. Thus, oil, gas and coal companies will pay more taxes, at least 2.9 USD billion more for the following years (Ministerio de Hacienda y Crédito Público, 2022).

Finally, there are two measures in tax reform that affect mainly financial and mining companies. First, in article 4, the government set higher taxes for the foreign dividends of multinationals with headquarters in other countries (Ministerio de Hacienda y Crédito Público, 2022). Since most of the direct foreign investment is related to the fossil fuels (Banco de la República, 2022), this policy will mainly impact hydrocarbon and mineral companies. Second, the government limits the tax benefits to 3% of the taxable income affecting financial, trade and mining firms¹⁴ (Ministerio de Hacienda y Crédito Público, 2022).

As a result, 51% of new fiscal revenues will come from the mining and hydrocarbon sector (Ministerio de Hacienda y Crédito Público, 2022). Then, following the categorisation of (Gudynas, 2015), the policies of the Colombian government are embedded within the post-extractivism agenda because the government is discouraging fossil fuel extraction from the supply side perspective.

¹² In next chapter I will analyse this issue in detail because the government has changed its initial opinion.

¹³ It is a tax for oil exports (Anton, 2017). However, the Colombian government proposed to implement this tax for all fossil fuels

¹⁴ The three main sectors that concentrate tax benefits are the financial sector with 24.2%, trade with 16.3% and mining with 7% (Pardo, 2020).

6.3 Impacts of stranding fossil fuels

Different think tanks have studied the consequences of not signing new exploration and exploitation contracts. They found that the Colombian economy would face a larger external and fiscal deficit. Likewise, they conclude that Colombia would lose their energy sovereignty by 2030 (Corficolombiana, 2022; Colombian Oil and Gas Association, 2022; Fedesarrollo, 2021).

Table 1. Impacts to not sign new exploration and exploitation agreements in the oil and gas sector

	Corficolombiana	Fedesarrollo	Colombian Oil and Gas Association
Fossil fuel extraction	Production would decrease by 9.8% per year	Not calculated	Colombia is a net exporter of gas. In 2026, the country will be net importer of gas
Exchange rate changes	Depreciation between 39.9% and 43.7% in 2027.	Depreciation by 64.2% in 2027.	Not calculated
Current account deficit	Between -8.6% and -15.4% of GDP in 2027. (For 2021 is -5.7% of GDP)	-6.9% of the GDP by 2030	Between 2022-2030 the country will reduce its USD dollar supply by USD 68 billion
Foreign investment	Not calculated	Would decrease 26% by 2030	From 2022 to 2026 foreign investment will decrease by at least USD 5 billion per year.
Economic growth	Not calculated	Economic growth would be 3.3% with oil exploration from 2022 to 2030. Without oil exploration would be 2.3%.	Not calculated
Taxes	Not calculated	From USD 2 billion to zero in 2030.	The fiscal revenue of the government will decrease by USD 3.98 billion

Source: Own elaboration based on (Corficolombiana, 2022; Colombian Oil and Gas Association, 2022; Fedesarrollo, 2021).

The Minister of Finance has recognised these challenges. He has said that the reduction of oil extraction would increase the external and fiscal deficit (Semana, 2022). Therefore, he points out that it is mandatory to continue fossil fuel extraction while the government encourages economic and energy transition.

6.3.1 Impacts due to the government announcements

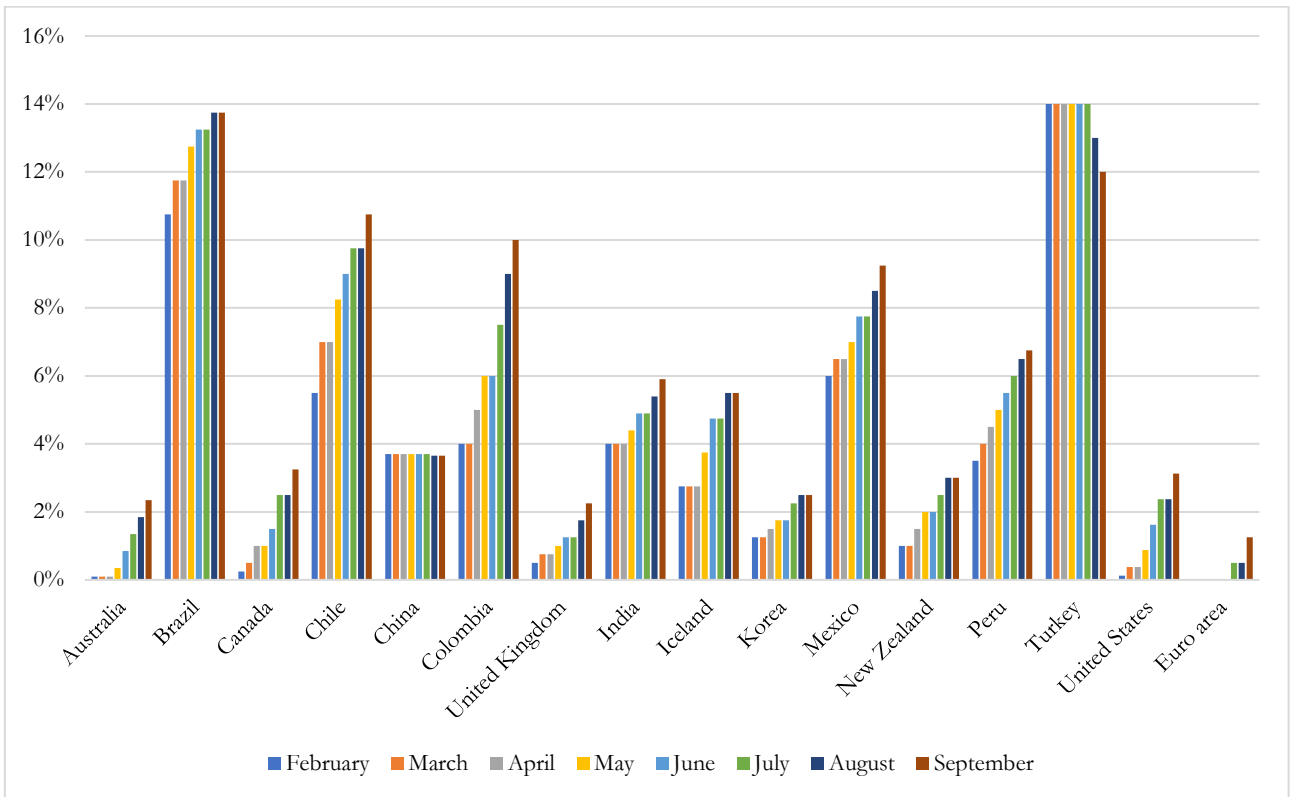
The government said it is mandatory to discourage the extractive model (Petro, 2022a; Pacto Histórico, 2022; Petro, 2022). To achieve this objective, the government will not sign new oil and gas exploration and exploitation agreements (W Radio, 2022; Silla Vacía, 2022).

While the government was making these announcements, the international economy suffered the consequences of the US monetary policy. In chapter 3, I demonstrated that the monetary system depends on the US economic policies, especially on the US interest rates and the US balance of payments (Ocampo, 2018). Due to the higher interest rates in the United States, capital outflows from most economies worldwide (IMF, 2022). In the Colombian case, USD 1.9 billions dollars flows from the economy (Banco de la República, 2022a). As a result, between 1 March and 27 October, the Colombian peso depreciated its currency by 29.2% (Banco de la República, 2022a). It created a debate about the cause of the capital outflows in Colombia, the government's policies related to the oil sector or the monetary policy in the US.

This debate is important for this investigation because the government announced in August and September that it would not sign new exploration and exploitation agreements. Afterwards, the Colombian peso depreciated by 11% (Bank for International Settlements, 2022a). Therefore, this case is useful to corroborate if the main challenge of post-extractivism is external restrictions. Nevertheless, it is necessary to do an advanced quantitative method to get an answer for this discussion. The main issue is that the depreciation of the Colombian peso worsened in the first week of October and this investigation has to be submitted on 9th November. Therefore, it is not possible to collect data and run an econometric regression. Notwithstanding this fact, I will use secondary data to contribute to this discussion.

From 1st March to 27th October, The Federal Reserve Bank raised the interest rate to control inflation (Bank for International Settlements, 2022). Since financial capitalists are speculative and they are looking for profits in the short-term (Bonizzi, 2014), they compare the local interest rate with the US interest rate. If the interest rate is greater in the US, they would rather invest in US bonds creating capital outflows from other economies. Then, central banks around the world raised their interest rate to avoid capital outflows and guarantee financial instability.

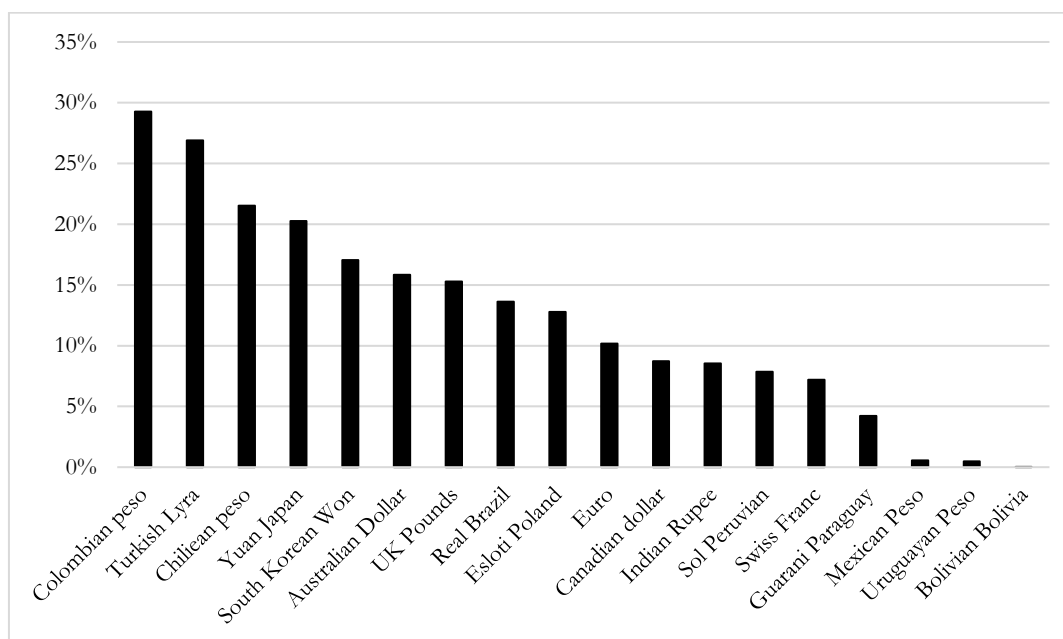
Figure 20. Central bank policy rates for different economies. February-September 2022



Source: (Bank for International Settlements, 2022)

This monetary policy has affected production and consumption causing a possible recession for 2023 (IMF, 2022). Due to the low expectations for the year 2023, the high inflation and the invasion of Russia, financial capitalists prefer to invest in US bonds. Therefore, capital outflows from different countries depreciating local currencies (IMF, 2022).

Figure 21. Depreciation of the local currency. March-October 2022 for different currencies¹⁵



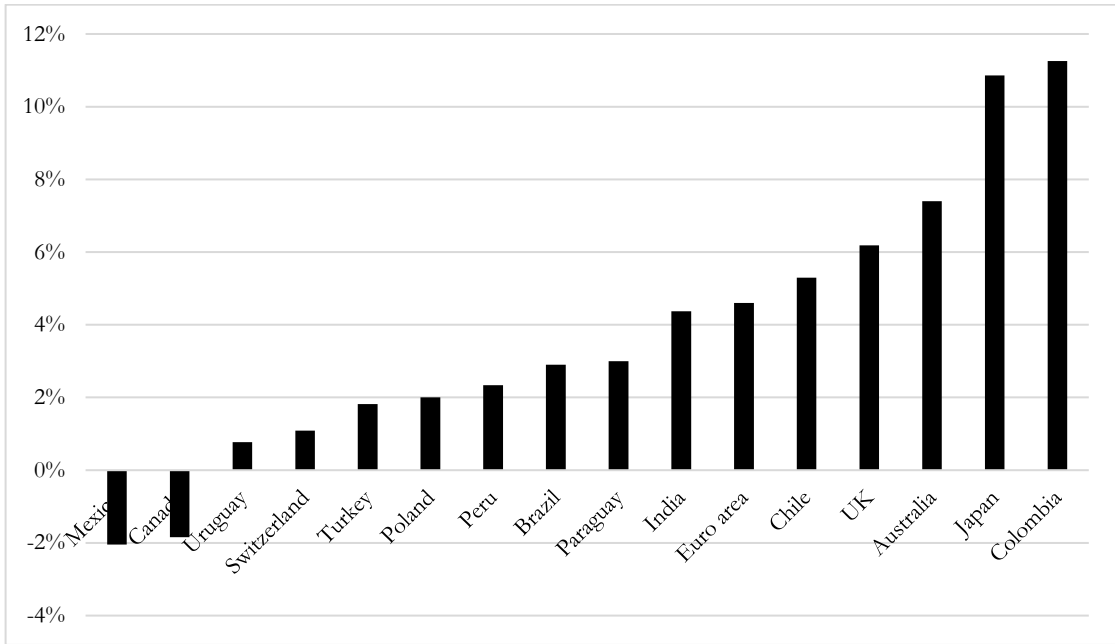
Source: (Trading View, 2022)

Nevertheless, economies at the bottom of the currency hierarchy are more vulnerable to capital outflows. The Federal Reserve Bank has raised the interest rate from March. Figure 21 depicts that the Colombian peso is one of the most depreciated currencies in the sample from March to October 27th. The depreciation of the Colombian peso was 29.2%, while the region average was 10.4% (Trading View, 2022).

Gustavo Petro was elected in July 2022, and he took presidential possession in August 2022. Between August and October 27th, the government announced that it would not allow fossil extraction from environmental protected areas and it would not sign new oil agreements (Silla Vacía, 2022) Likewise, the Minister of Finance formulated tax reform to raise fiscal revenues by taxing oil sector. In the same period, the Colombian peso depreciated 11,25%, while the average depreciation of the region was 3.36% (Bank for International Settlements, 2022a). It demonstrates that there is an additional factor which affects the Colombian economy.

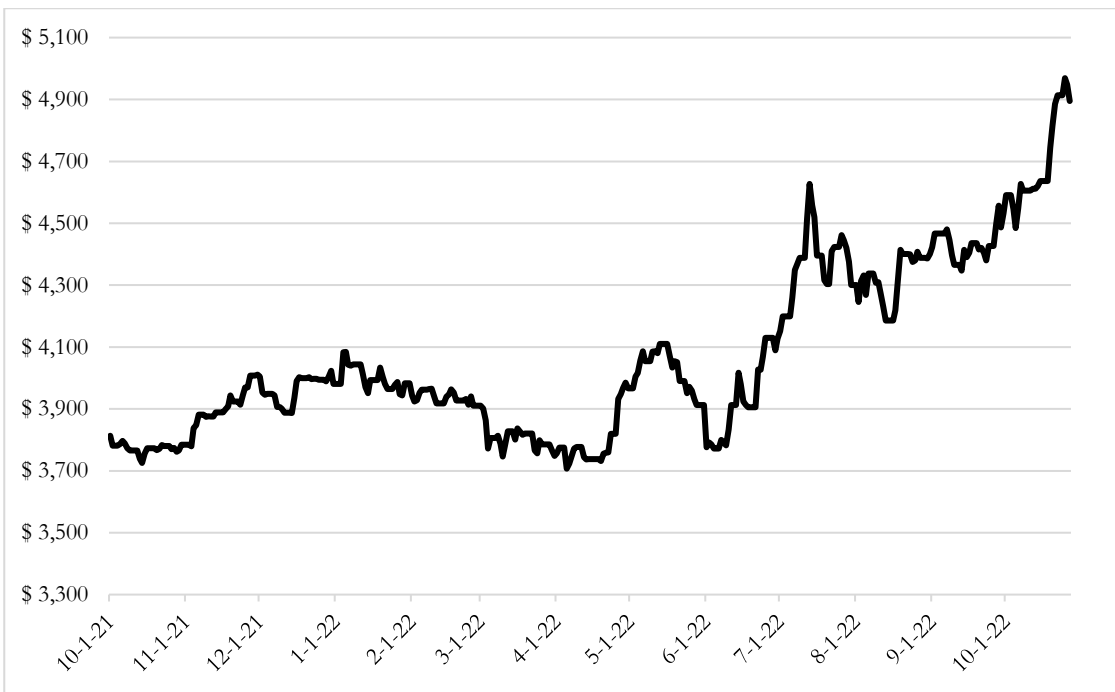
¹⁵ This sample has three types of countries. Economies with hard currencies, the most important economies of Latin America, and economies with the most depreciate currencies according to (Trading View, 2022). These three categories give a complete perspective of the performance of the exchange rate in the world. I excluded Sri Lanka because its economy facing a particular financial crisis. Moreover, I did not include Argentina, and Venezuela because they are facing financial instability long time ago. Moreover, these economies have a large illegal exchange market and they do not have a reliable statistic source of information.

Figure 22. Nominal depreciation between 1st August- 28 October



Source: (Bank for International Settlements, 2022a)

Figure 23. Nominal exchange rate Colombian pesos and USD dollars. October 2021-October 2022



Source: (Banco de la República de Colombia, 2022)

From July 2022, the external vulnerability has worsened in Colombia (See figure 23). However, during these months, oil prices and exports remain stable (Agencia Nacional de Hidrocarburos, 2022). Then, the effect on the exchange rate is given by the dynamics in the financial capital movements. This conclusion is predicted by (de Paula, et al., 2017), who argues that in the financialisation era, the exchange rate is determined by financial movements in the short term.

As I showed before, the oil dynamic strongly impact on the Colombian economy. Due to the new policies of the government related to the oil sector, investors believe that the Colombian economy would face fiscal and external issues. Then, they would rather invest in other countries. Some US business associations related to oil sector have published a letter expressing their preoccupation about the new policies of the Colombian government (Blu Radio, 2022). Likewise, J.P Morgan has published two analyses arguing that the new policies have created uncertainty for investors (J.P. Morgan, 2022; J.P. Morgan, 2022a). Finally, some financial capitalists analysing their investments considering the "Petro risk-premium" (Jaramillo, 2022).

Although an advanced quantitative method is necessary to analyse the impacts of the post-extractive policies on the exchange rate, it is possible to get two conclusions. First, there is something that is affecting more the Colombian economy. Its depreciation rate is higher than the average of the region and it has one of the highest depreciations in the world. Secondly, the post-extractive policies have affected the expectations of the investors. Between August and 27 October, the Colombian peso depreciated its currency by 11%, while the region average was 3.4% (Bank for International Settlements, 2022a). It was confirmed by the Minister of Finance who said that the depreciation rate in the first weeks of October was due to the US monetary policy and due to uncertainty created by some announcements of the cabinet in August and September (Semana, 2022). Due to the pressure on the exchange rate, the Colombian president said that government will continue extracting oil, gas, and coal. Furthermore, the Minister of Mining and Energy said that the government is analysing the possibility of signing new exploration and exploitation agreements (El Colombiano, 2022). Therefore, the government changed its initial position. Initially, they rejected the possibility of signing new contracts. However, due to the massive outflows and the effects on the exchange rate, the government is evaluating to continue this policy.

The currency hierarchy theory predicts this evidence. From this perspective, countries at the bottom of the currency hierarchy cannot formulate some policies because it could create uncertainty for financial investors. Then, in the Colombian case, the government must choose between environmental protection and financial stability.

Based on this evidence, it is possible to get four conclusions. First, the depreciation of the Colombian economy is explained by the US monetary policy and the uncertainty due to the post-extractive policies of the government. Nonetheless, it is necessary to run an econometric model to quantify which factor was more important. Secondly, the problem is not the formulation of post-extractive policies itself; the issue is rooted in the monetary system. Due to the imbalances in the monetary system, countries in the south have less policy space. Then, it is necessary to reform the monetary system to adapt our economy to planetary boundaries. Third, it demonstrates that the south has some limits to strand fossil assets. Then, countries with hard currencies and a broad policy space must unburn fossil fuels to limit our economy to planetary boundaries. Finally, this analysis demonstrates that post-extractivism and ecological economics schools are right: It is not possible to unburn fossil fuels in the current economic system.

Chapter 7. Policy recommendation

Although Colombia is facing external restrictions to follow the post-extractive agenda, there are some policies that the country can formulate to limit its economy to planetary boundaries and reduce external constraints. There are two types of policies, the first one is related to the real sector and the second one is related to the financial sector.

The three gaps model frames the policies related to the real economy. The main recommendation of this model is to industrialise the economy to reduce external restrictions and develop the economic structure (Samaniego, et al., 2022; Gramkow & Porcile, 2022). From this approach, investing in research and development is essential to produce Colombian technology related to the renewable energy sector. It would industrialise the economy, and it would encourage the energy transition.

The second category of policy recommendations is related to the financial sector. In Colombia, the exchange market is dominated by private banks. Since their objective is to make profits, there is no guarantee that hard currencies will be used for the industrialisation of the economy. Then, it is essential that the government finances the public development banks to compete in this market and accumulate hard currencies to promote the industry. Moreover, the government must create policies to prevent the multinationals send their profits to their headquarters (Löscher, 2022). For example, higher foreign dividends taxes would help retain hard currencies in the economy. Finally, different financial proposals exist to unburn fossil fuels and reduce external constraints. For example, swap debt and inverse auctions (Lazarus & Van Asselt, 2018; Pellegrini, et al., 2021). Through these mechanisms, countries could strand fossil assets and reduce external constraints.

Finally, I demonstrated that the problem is not the post-extractive policies themselves. The issue is rooted in the imbalances in the monetary system. In this way, Aguila, et al., (2022) suggested a new financial structure. Based on Keynes's proposal, the IMF should create a green bancor to promote green investment. Although Colombia does not have the power to reform the financial system, it is essential to encourage this debate to push for a possible financial transformation in the future.

Chapter 8. Conclusion

Post-extractivism argues the extractive model generates negative impacts on the economy and the environment. Therefore, it is necessary to advance toward an economy without dependency on fossil fuel extraction. Nevertheless, there are different challenges in achieving this objective. First of all, production depends on the energy transmitted by fossil fuels. The main problem is that renewable energies are not powerful as fossil fuels. Then stranding fossil assets would affect the whole economy.

Another important challenge for the post-extractive agenda is the export dependency on fossil fuels, especially, on the external sector. Thereby, stranding fossil assets will create a shortage of US dollars that will impact the economy in two ways. The first one is related to the real sector. The lack of the USD dollar will depreciate the local exchange rate affecting the price of imports. Since the south is a net importer of intermediate goods, higher import prices will create higher costs for local production. As a result, the economy will face inflation pressure.

The second way to impact the economy is related to the speculation of financial investors. Since the south has a dependency on the fossil fuels dynamic, capitalists believe that stranding fossil assets will create higher deficits and macroeconomic instability. It would affect economic expectations. Then, they would rather invest in other countries. Moreover, the lack of hard currency will affect international reserves, reinforcing low economic expectations. As a result, capital outflows from the economy, depreciating local currency and creating financial instability.

The big challenge is that most of the hard currency supply is given by the mining and hydrocarbon sector in the south. Then, if a periphery does not export fossil fuels, it would affect its economic and financial stability. Thereby, countries in the south have to choose between environmental protection and financial stability.

In Colombia, the new government has promoted different post-extractive policies. One of the most important is that the government would not sign new oil exploration and exploitation agreements. While the government was promoting this agenda, the Federal Reserve Bank set higher interest rates to control inflation. As a result, there were capital outflows from economies in the south. However, Colombia had one of the highest depreciation rates in the region. Thus, it creates a debate about the cause of the depreciation: the post-extractive policies or the monetary policy of the United States.

I presented some secondary data which allows me to conclude that depreciation in Colombia is explained by the influence of the US monetary policy and another factor. In March 2022, the Federal Reserve Bank raised interest rates causing capital outflows and depreciations in most currencies worldwide. Nevertheless, between March and October, the Colombian peso suffered one of the highest depreciation rates in the region. The depreciation was 29,28% in Colombia, while the region average was 10,4%. Many factors could explain this gap; however, I suggested that the post-extractive policies of the government could impact the expectations of the investors producing capital outflows. Nevertheless, it is necessary to run an econometric model to quantify which factors affected more the Colombian economy.

This hypothesis is compatible with the financialisation theory and the currency hierarchy. These theories argue that the expectations of financial investors produce instability. In the Colombian case, I demonstrated that the economy depends on the oil sector. Then, the policy to stop new oil exploration and exploitation affected the investors' expectations because they believed that the economy would face external and fiscal problems. It is confirmed by three reports from international institutions, which found that the government's new policies had created uncertainty among financial investors.

Although this evidence could demonstrate that post-extractive policies are not possible in the south, it is essential to highlight that the problem is rooted in the monetary system. Due to the imbalances in the monetary system, countries in the south have less policy space. Then, it is necessary to reform the monetary system to limit our economies to planetary boundaries.

This investigation has four important limitations. First, it is a pure theoretical reflection. I did not run an econometric regression to quantify what factors were more important to determine the depreciation of the Colombian economy. Then, future investigations should analyse this topic using an econometric model. The second limitation is that the currency hierarchy has four determinants. However, I only studied in detail one of them. It would be useful to study the others in detail. Third, I only considered the most contaminant minerals and hydrocarbons. Nevertheless, some minerals could play a vital role in the economic transition. Then, future research should analyse the post-extractive policies for these commodities. Finally, I assume that peripheral economies are homogenous. However, there are large differences between peripheral countries. Therefore, it is important to analyse the particularities of the south to analyse post-extractive scenarios.

As a theoretical reflection, the post-Keynesian theory has some limits to understand the political aspects of these issues. Oil companies have disproportionate power over the economy. Thereby, it is necessary to complement the theoretical framework to have a complete approach to the problem.

Finally, this investigation demonstrates that the problem of unburn fossil fuels is rooted in the monetary system. Although there are some challenges to achieve this objective, it is urgent to limit our economy to planetary boundaries. Otherwise, our society will suffer worse consequences due to climate change. (Daly, 2005, p. 107) formulates a fantastic solution for this challenge “In choosing between tackling a political impossibility and a biophysical impossibility, I would judge the latter to be the more impossible and take my chances with the former”

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