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ANALYSIS OF THE POLITICAL BUSINESS-CYCLE THROUGH DSGE MODELS, THE CASE OF ECUADOR

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Abstract.
This investigation aims to analyze the impact of political instability on economic activity in Ecuador during the 2000–2023 period, within the framework of a dollarized economy. To this end, two dynamic stochastic general equilibrium (DSGE) models are developed: a neoclassical (RBC) model and a New Keynesian (NK) model, both calibrated to replicate Ecuador's main macroeconomic aggregates.
The study explicitly incorporates a political transmission channel through a stochastic shock that affects total factor productivity and public investment execution. Both models are used to generate counterfactual simulations, enabling an evaluation of key variables such as non-oil GDP, public capital, and aggregate consumption under different institutional stability scenarios. From a historical-economic perspective, the model's results are contextualized using key events in Ecuador's recent history, such as the 2005 political crisis, the fiscal reforms between 2007 and 2016, and the social and health crisis of 2020.
The conclusion is that political instability significantly undermines the effectiveness of public expenditure as a macroeconomic stabilizer, particularly in settings characterized by procyclical fiscal rules and limited monetary autonomy. Furthermore, the New Keynesian framework proves to be a more suitable tool for analyzing fiscal policy in Latin America, especially in environments marked by institutional rigidities and nominal frictions.

Keywords: Political Business Cycle; Economic growth; DSGE Models; Elections in imperfect democracies.

JEL Classification: E12, E32, D72, N16, O54.

1. Introduction.

The analysis of the interaction between politics and economics has occupied a central place in economic science and in contemporary political history. In this field, Stochastic Dynamic General Equilibrium (DSGE) models have established themselves as a robust tool to understand complex macroeconomic phenomena, as they allow the integration of microeconomic fundamentals, rational expectations and structural shocks in a coherent modelling framework. Through this methodology, it is possible to capture, in a structured way, the effects of fiscal decisions and episodes of political instability on the aggregate performance of an economy.

In Latin America, and particularly in Ecuador, studies that apply DSGE models are still scarce, which contrasts with the relevance of these approaches in the international literature. Ecuador's uniqueness – marked by dollarization since 2000, dependence on oil revenues and a history of recurrent political crises – makes this country an ideal laboratory for evaluating the relevance of these models in contexts of fragile or "imperfect" democracies. This category has been used by González (2000) and taken up by the Economist Intelligence Unit (2019), who emphasize that political stability and institutional legitimacy are fundamental elements for understanding economic dynamics in countries where the room for maneuver of public policies is conditioned by exogenous and endogenous factors of governance.

In this framework, the present work pursues a double purpose. First, to build a DSGE model calibrated for Ecuador that incorporates elements of the neo-Keynesian tradition—nominal rigidities, consumption habits, and an active fiscal sector—capable of more realistically capturing the effects of public policy in the short and medium term. Second, to contrast the results obtained with a neoclassical-inspired model (CBR), in order to identify the strengths

and limitations of each approach in the analysis of the technological, fiscal, and political shocks that have marked the recent trajectory of the Ecuadorian economy. This comparative strategy makes it possible to analyze, through counterfactual simulations, the role of public expenditure as a driver of aggregate demand and as an instrument of political legitimation.

The theoretical evolution of the DSGE models justifies this approach. The first models, inspired by the theory of real business cycles, assumed perfectly competitive markets, price flexibility and rational agents that instantly adjusted their behavior in the face of exogenous shocks. Although useful as a structural reference, these models have been widely questioned for their inability to capture nominal frictions and institutional rigidities observed in practice, especially in emerging economies. In response to these limitations, neo-Keynesian models (NK-DSGE) emerged, introducing price and wage rigidities, neo-Keynesian Phillips curves, and fiscal and monetary policy rules, allowing stylized facts to be replicated and the impacts of economic policy to be analyzed more accurately (Christiano, Eichenbaum, & Evans, 2005; Smets & Wouters, 2007). Subsequent studies, such as those by Adolfson et al. (2007), An & Schorfheide (2007), and Christiano, Eichenbaum & Trabandt (2018), reinforced the relevance of this approach by demonstrating its ability to evaluate counterfactual scenarios and contrast theory with empirical evidence using Bayesian techniques and structural VAR.

Within this framework, public spending acquires special relevance. Nordhaus (1975) introduced the notion of the "political-economic cycle", where democratic governments manipulate fiscal or monetary variables for electoral purposes. Kraemer (1997) and González (2000) documented how, in contexts of institutional weakness, fiscal policy tends to be procyclical, amplifying recessions rather than attenuating them. In Latin America, Basabe and Polga (2017) have shown that public spending is closely linked to government legitimacy, while Rodríguez (2009) stresses that low tax progressivity and limitations in social spending perpetuate inequality. In the Ecuadorian case, dollarization has limited monetary policy, making public spending the main instrument for macroeconomic stabilization and legitimacy building (Cueva & Díaz, 2019).

The NK-DSGE models, by incorporating nominal rigidities and institutional constraints, allow for a more accurate assessment of the effects of public expenditure on this type of economy. These models have proven particularly useful in counterfactual exercises, such as those that analyze the impact of expansionary fiscal policies during recessions or the economy's response to shocks of political uncertainty (Smets & Wouters, 2007; Drazen & Eslava, 2010). In the case of Ecuador, such exercises allow us to investigate how key variables – non-oil GDP, public capital, aggregate consumption – would have evolved in the absence of institutional crises such as those of 2005 or 2019, or under scenarios of countercyclical fiscal policies.

The relevance of this research is also justified in historical terms. Since the financial crisis of 1999 and the subsequent dollarization, the Ecuadorian economy has been marked by episodes of political instability, successive presidential impeachments, deep fiscal reforms, and growing social unrest. The literature on political economy has pointed out that fiscal decisions in this period did not respond only to criteria of economic efficiency, but also to the need to sustain regimes with low levels of legitimacy (Polga & Sánchez, 2020; Basabe & Martínez, 2014). Thus, the inclusion of a "political shock" within the DSGE model responds to the need to capture a structural feature of Ecuadorian economic history: the vulnerability of fiscal policy to institutional conflict.

In this sense, this paper contributes to Latin American literature by integrating two traditions of analysis that are rarely found in the same study: on the one hand, the political economy of the business cycle (Alesina, Campante, & Tabellini, 2008; Dornbusch & Edwards, 1991), and on the other hand, structural modelling based on microeconomic foundations using DSGE.

The comparative approach adopted seeks to demonstrate that the neoclassical model is more suitable for contexts of relative institutional stability (2000–2006), while the neo-Keynesian model offers greater explanatory capacity in environments of intense state intervention, political conflict, and structural rigidities (2007–2023).
In short, this integrated chapter lays the theoretical and methodological foundations of the study, while contextualizing the Ecuadorian case in a historical trajectory of high political volatility and dependence on public spending. Political instability is proposed to be a structural determinant of macroeconomic performance, which fully justifies its inclusion as a key variable in the models developed. The comparison between a neoclassical and a neo-Keynesian framework not only offers a methodological contrast, but also allows the historical narrative to be enriched with counterfactual simulations, thus contributing to the understanding of the economic-political cycle in an imperfect democracy such as Ecuador's.
This work is structured as follows. Chapter 2 offers a historical, political, and economic context of Ecuador between 2000 and 2023, incorporating descriptive graphs that allow the evolution of macroeconomic indicators and institutional instability to be visualized. Chapter 3 explains the foundations and structure of the DSGE models used, detailing the assumptions, parameters and differences between the neoclassical and neo-Keynesian approaches. Chapter 4 contains the results of the simulations in the face of a political shock, including a structured comparison of both models and dynamic response graphs, evaluating their operation in different fiscal policy scenarios, as well as their macroeconomic implications. Chapter 5 discusses the findings obtained in the light of the specialized literature and the Ecuadorian historical context. Finally, chapters 6 and 7 present the main conclusions and recommendations for public policy.

2. Historical, political and economic context of Ecuador in the study period.

Ecuador's economic and political trajectory in the first two decades of the twenty-first century has been marked by successive crises, institutional reforms, and transformations in the legitimacy of presidential power, factors that have redefined the role of the State and the use of public spending, both as a tool for macroeconomic stabilization and for political legitimation in a fragile democracy.
The starting point was the financial crisis of 1999, which led to the collapse of banks, hyperinflation and the sharp depreciation of the sucre. Dollarization, adopted in January 2000 by President Jamil Mahuad, stabilized inflation and anchored expectations, although at the cost of monetary autonomy, making public spending the main instrument of economic policy (Basabe & Martínez, 2014; Cueva & Díaz, 2019). The first years of the new monetary regime were marked by deep political instability: between 2000 and 2006, Ecuador had three presidents, several of whom failed to complete their terms. The dismissal of Lucio Gutiérrez in 2005, after the so-called "Rebellion of the Outlaws", reflected citizen unrest and weak institutions, in a highly fragmented and personalistic political system that directed spending towards clientelistic ends rather than towards development policies (Polga & Sánchez, 2020; Conaghan, 2012).
The election of Rafael Correa in 2006 meant a profound shift in the orientation of the State. With the new Constitution of 2008 and the promotion of a development model based on massive public investment financed by oil revenues, his government promoted a period of economic bonanza with growth above the regional average, poverty reduction, and expansion of spending on infrastructure, health, and education (de la Torre, 2012; Cueva & Díaz, 2019). This model is aligned with the literature that links left-wing governments with greater state prominence and expansion of social spending (Freier & Odendahl, 2015). However, it was

also criticized for the concentration of power, institutional cooptation, and the drift towards technocratic populism (Polga & Sánchez, 2020; Basabe & Martínez, 2014).

From 2017, with the presidency of Lenín Moreno, a stage of political fragmentation and uncertainty began, marked by the break with Correismo, the popular consultation against indefinite reelection, the fall in the price of oil and the subsequent COVID-19 pandemic. The austerity measures adopted, partly under agreements with the IMF, led to strong social protests such as those of October 2019. In 2021, Guillermo Lasso took office with a liberal agenda, but his administration faced security crises, legislative blockages and progressive loss of legitimacy, culminating in 2023 with the dissolution of the National Assembly through the figure of "crossed death". All this history confirms that political instability and institutional fragility have been constants that have conditioned economic performance and the effectiveness of fiscal policy, justifying its inclusion as a key variable in the analysis of this work.

2.1 Key macroeconomic indicators (1990-2023).

The analysis of Ecuador's macroeconomic evolution over the last three decades is essential to contextualize the fiscal, political, and social dynamics that underpin this study. Through the examination of aggregate variables such as real GDP, public spending, capital formation, inflation, and foreign direct investment, it is possible to identify structural patterns, phases of economic expansion and contraction, as well as the effects of relevant public policies and exogenous shocks.

The following series of charts presents an overview of these indicators, allowing us to visualize both long-term trends and turning points derived from critical episodes such as the 1999 financial crisis, dollarization, the boom in public spending between 2007 and 2014, and the impact of the COVID-19 pandemic. This empirical evidence provides a solid basis for further discussion on the effects of fiscal policy and political stability on the country's macroeconomic performance.

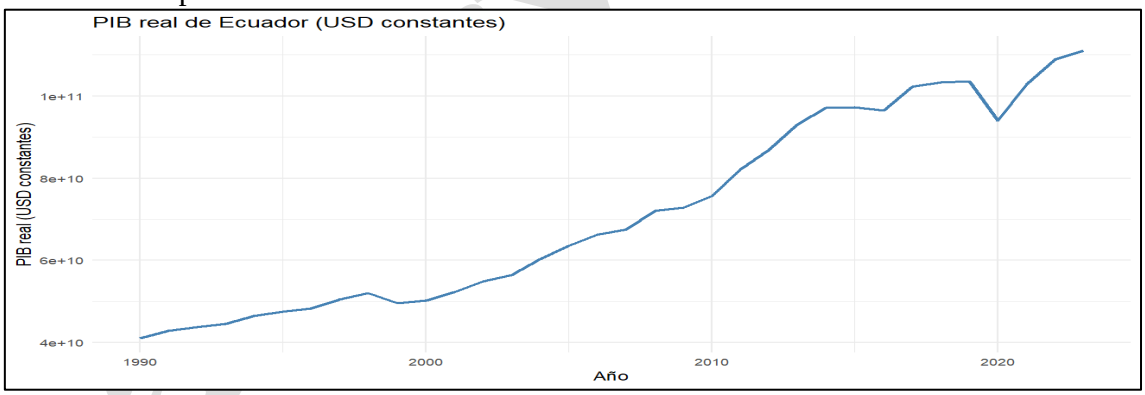

Figure 1. Ecuador's real GDP (constant USD).In original Spanish language

Figure 1 shows the evolution of Ecuador's real Gross Domestic Product (GDP) between 1990 and 2023, measured in constant dollars. The series highlights the impacts of events such as the 1999 financial crisis, the oil price boom in the 2000s, the 2015 recession, and the COVID-19 pandemic-associated slump in 2020. The general trend is one of growth, although interrupted by episodes of both economic and political instability.

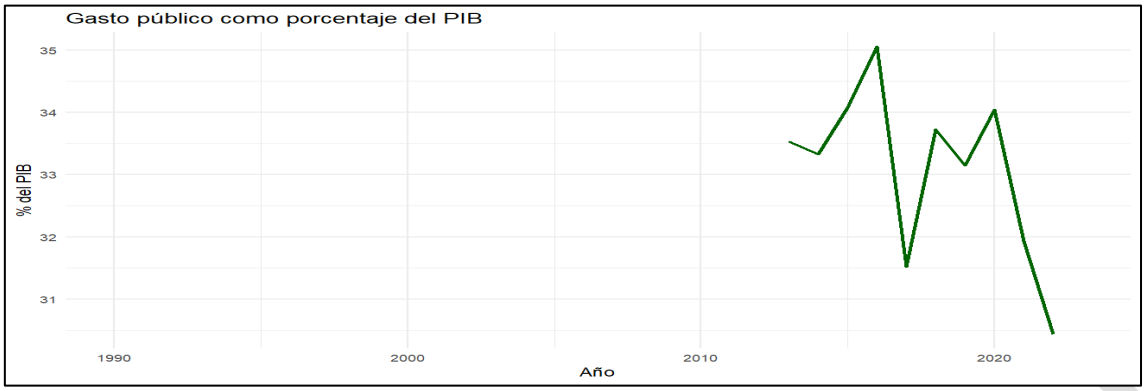

Figure 2. Public expenditure as a percentage of GDP.In original Spanish language

Figure 2 represents general government public expenditure as a percentage of GDP. A significant expansion was observed during the period 2007–2014, coinciding with the boom in public spending in the government of Rafael Correa. From 2015 onwards, a relative contraction is perceived, aligned with fiscal restrictions derived from lower oil revenues and structural limitations of the rentier model.

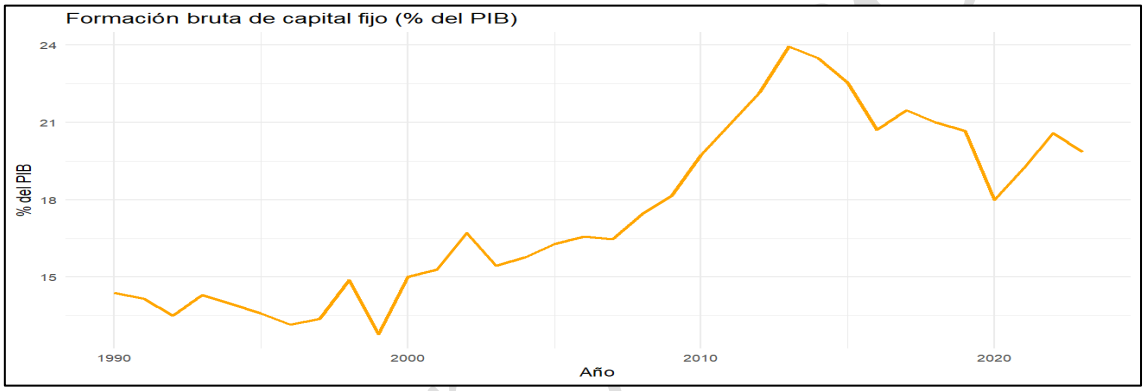

Figure 3. Gross fixed capital formation (% of GDP).In original Spanish language

Figure 3 presents gross fixed capital formation as a proportion of GDP, a key indicator for assessing investment in infrastructure and productive capacity. Its trajectory reinforces the narrative of investment-intensive public policy during the first half of the 2010s, with a subsequent reversal reflecting fiscal constraints and economic slowdown.

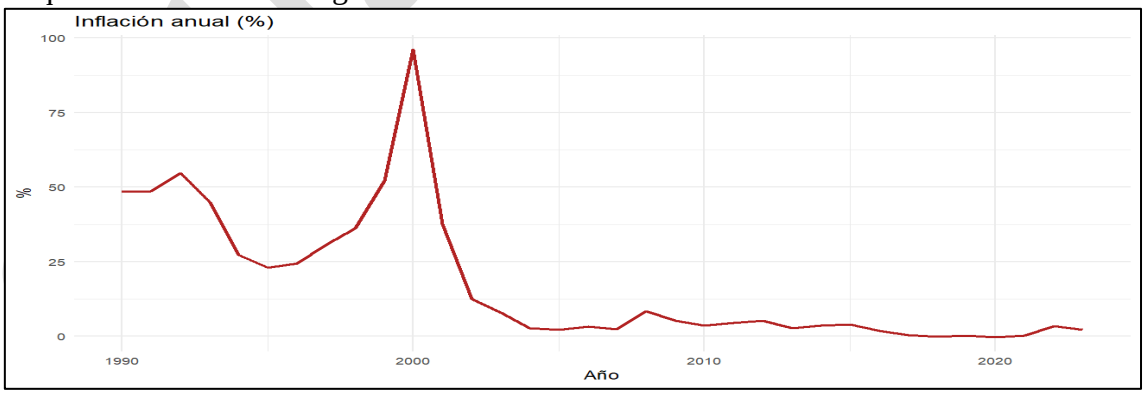

Figure 4. Annual inflation (%).In original Spanish language

Figure 4 illustrates the evolution of annual inflation in Ecuador. A sharp reduction can be seen in the early years of the twenty-first century, after dollarization. Since then, the monetary regime has contributed to maintaining low and stable inflation levels, despite external shocks such as the global crisis of 2008 or the pandemic of 2020.

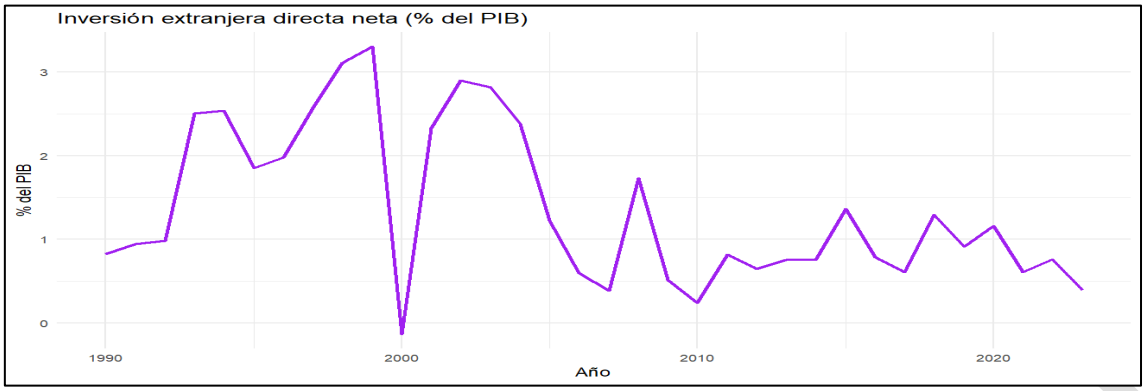

Figure 5. Net foreign direct investment (% of GDP).In original Spanish language

Figure 5 shows the behavior of net foreign direct investment in relation to GDP. The flow has historically been volatile and relatively low, conditioned by the institutional environment, the perception of country risk and dependence on the oil price cycle.

2.2 Dynamics of political instability and their historical evolution (1990–2023).

Throughout the period 1990–2023, Ecuador has undergone profound political transformations that have had a direct impact on macroeconomic behavior and public policymaking. In order to adequately contextualize the models developed in this work, it is necessary to analyze the political environment through indicators that reflect institutional instability, patterns of social conflict, and government capacity. Below are three graphs based on a historical reconstruction of the country's main political events. These inputs allow you to visualize key trends related to:

- The frequency of national protests.
- The evolution of a synthetic index of governance.
- The recurrence of abrupt or anticipated presidential changes.

These variables not only document the magnitude of the political environment, but also allow us to interpret the behavior of the model's agents in different scenarios of institutional instability and trust.

Figure 6. Number of National Protests in Ecuador (1990–2023).In original Spanish language

Figure 6 shows the annual evolution of the number of national protests in Ecuador. A sustained increase is observed during the 1990s, with peaks in the years 1997–1999 and a significant maximum during the period 2006–2007. Subsequently, the trend oscillates, with new increases starting in 2019, a year characterized by important social mobilizations.

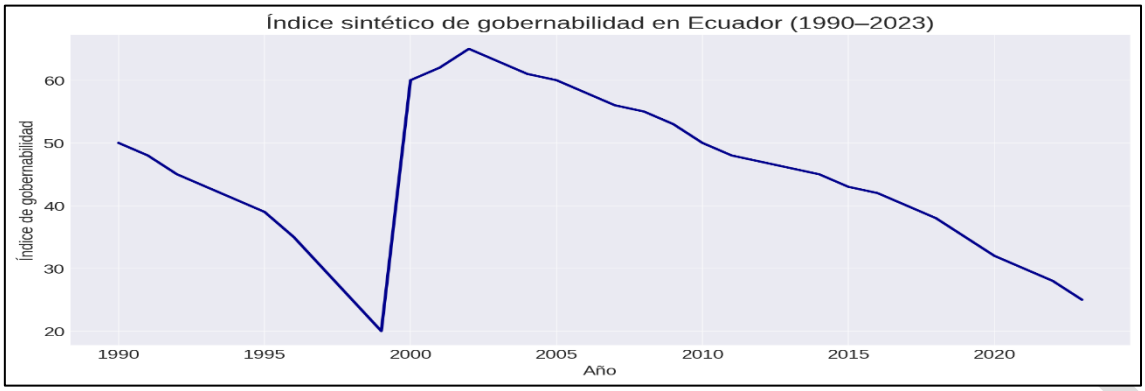

Figure 7. Synthetic Index of Governance in Ecuador (1990–2023).In original Spanish language

The governance index shows a progressive decline during the 1990s, reaching its lowest point in 2000. Subsequently, there was a moderate recovery between 2002 and 2012, followed by a further decline, accentuated in recent years. This indicator reflects the institutional and political perception of stability and governmental capacity.

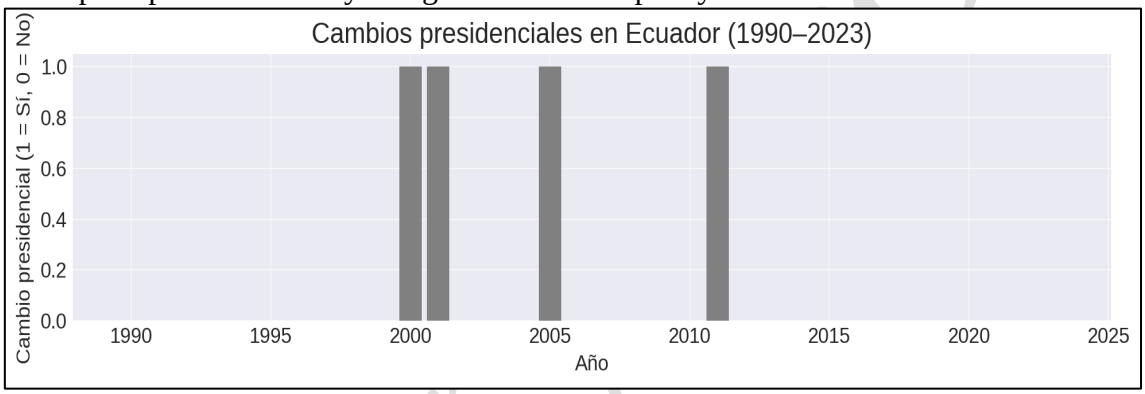

Figure 8. Presidential Changes In Ecuador (1990–2023).In original Spanish language

This bar chart reflects the years in which presidential changes occurred. The years with a value of 1 indicate the replacement of the head of state, highlighting the institutional ruptures of 1996, 1997, 2000, 2005, 2017 and 2021, in some cases by non-electoral means. These events have strongly conditioned the country's macroeconomic framework.

The indicators analyzed allow us to clearly visualize the cyclical and persistent nature of political instability in Ecuador over the last three decades. The number of national protests reveals a growing trend, especially accentuated in periods of institutional crisis, such as the years 1997–2000, 2005, 2019 and 2022. This phenomenon expresses the deterioration of the relationship between the State and various social sectors, as well as the accumulated discontent with the economic policies adopted.

The synthetic index of governability shows a behavior consistent with these episodes, registering notable falls in moments of abrupt transition of power or weakening of the party system. The improvement observed in certain sections (for example, between 2007 and 2013) coincides with the consolidation of political projects with a high capacity for institutional control, such as the one led by Rafael Correa. However, this stability was followed by a further deterioration from 2017 onwards, marked by political fragmentation and loss of legitimacy.

Finally, the frequency of presidential changes outside the electoral calendar shows the fragility of the rules of the democratic game during several years of the period studied. The

recurrence of presidential substitutions in contexts of political upheaval demonstrates the volatility of the executive branch and its impact on the credibility of the State.
Taken together, these indicators allow us to affirm that political instability has not only been a recurrent feature of contemporary Ecuador, but also a structural factor that has conditioned the effectiveness of public spending and the development of counter-cyclical policies. This finding fully justifies its inclusion as a key variable (φt) in the DSGE models developed in the following chapters of this work.

3. Fundamentals and structure of the DSGE models used.

This work is based on the use of DSGE (Dynamic Stochastic General Equilibrium) models as a tool to analyze the macroeconomic behavior of Ecuador in recent decades, with special attention to the role of public spending and the effects of political instability on economic activity. In particular, two versions of the DSGE model have been implemented: a neoclassical RBC (Real Business Cycle) model and a neo-Keynesian (NK) model. Both allow us to evaluate relevant counterfactual scenarios, although from different structural assumptions.
The decision to use a comparative approach responds to two main motivations:

- First, to offer a broad perspective on the transmission of fiscal policies and political shocks in a dollarized and institutionally vulnerable economy such as Ecuador's.
- Second, to contrast the theoretical and empirical implications of each framework in order to observe its strengths and limitations in the face of specific historical events.

3.1 Neoclassical DSGE Model: Assumptions and Structure.

The neoclassical model implemented follows the tradition of the CBR models, where the competitive and flexible functioning of markets, the instantaneous adjustment of prices and wages, and the intertemporal rationality of agents are assumed. In this environment, exogenous shocks to productivity or export prices (such as oil) affect the economy through investment, work, and consumption decisions (Christiano et al., 2018; Smets & Wouters, 2003).
The main components of the model are:

- **Representative households**, which maximise their utility based on consumption and leisure, deciding the level of work and savings.
- **Competitive companies**, which maximize profits using private and public capital.
- **Fiscal sector**, where the State collects taxes and allocates the income to public spending and investment, acting as the main engine of aggregate demand.
- **Absence of nominal rigidities**, which implies that prices are immediately adjusted to new equilibria.

The model is calibrated with realistic parameters of the Ecuadorian economy, and is simulated to observe the evolution of non-oil GDP, public capital, consumption and public investment in the face of a structural political shock modeled as a persistent disturbance to institutional stability.
The following table shows the parameters used for the calibration of the neoclassical model, along with their economic interpretation and source where applicable.

Table 1. Calibrated parameters of the neoclassical model

Parameter	Value	Description	Source/Justification
A	0.33	Capital's share of the production function	Standard in the literature (Christiano et al., 2018)
D	0.05	Capital depreciation rate	Reasonable assumption

Table 1. Calibrated parameters of the neoclassical model

Parameter	Value	Description	Source/Justification
B	0.99	Intertemporal discount factor	It is equivalent to an annual interest rate of 4%
θg	0.3	Elasticity of GDP with respect to Kg	Calderón and Servén (2004)
F	1	Political productivity (base: full efficiency)	Set to simulate a fall in the face of political shock
r_f	0.9	Persistence of the political shock	Standard Assumption (AR(1) Persistent)
s_f	0.05	Volatility of the political shock	Standard Calibration Value

This framework is useful for understanding long-term dynamics, the effects of sustained fiscal policy, and the importance of public capital in growth.

3.2 Neo-Keynesian DSGE Model: Assumptions and Structure.

The neo-Keynesian model used incorporates a series of nominal and real rigidities that allow a more realistic representation of economic behavior in the face of short- and medium-term shocks, particularly relevant in contexts of political uncertainty or fiscal crisis (Fernández, Rubio & Schorfheide, 2015; Davig & Leeper, 2007).

Unlike the RBC model, the NK approach introduces:

- **IS curve**: reflects the equilibrium of intertemporal consumption affected by the real interest rate and the future expectation of output.
- **Neo-Keynesian Phillips curve**: prices that are gradually adjusted due to rigid price contracts such as Calvo (1983).
- **Reactive fiscal rule**: in the absence of monetary policy (due to dollarization), a public spending rule is specified depending on the output gap and indebtedness.
- **Labor market rigidities**: including labor supply inelasticity and implicit wage constraints.

Likewise, the model includes a structural political shock, introduced as a disturbance that alters the behavior of public spending (reducing efficiency or changing the allocation of spending), simulating contexts of political conflict, elections, or low institutional legitimacy.

The following table shows the structural parameters used in the calibration of the neo-Keynesian model with nominal stiffnesses and Taylor's rule.

Table 2. Calibrated parameters of the neo-Keynesian model

Parameter	Value	Description	Source/Justification
B	0.99	Discount rate	Standard
s	1	Intertemporal elasticity of consumption	Standard
Ppp	1.5	Monetary policy response coefficient to inflation	Standard Taylor Rules (Taylor, 1993)
phy	0.5	Responding to the production gap	Standard
I	0.75	Price Rigidity (Calvo)	Christiano et al. (2005)
E	6	Elasticity of substitution between goods	Equivalent to a price margin of 20%
r_f	0.85	Persistence of the political shock	Consistent with neoclassical model

Table 2. Calibrated parameters of the neo-Keynesian model

Parameter	Value	Description	Source/Justification
s_f	0.05	Volatility of the political shock	Consistent with neoclassical model

This version of the model is particularly suitable for analyzing the period 2007–2023, where the Ecuadorian economy was subject to high institutional volatility, constitutional reforms, social protests, and drastic changes in the management of public spending (Polga & Sánchez, 2020; Basabe & Martínez, 2014).

Table 3. Initial theoretical comparison between the two models

Feature	Neoclassical Model (RBC)	Neo-Keynesian (NK) model
Type of markets	Perfectly competitive	With nominal and actual stiffness
Prices and wages	Flexible	Price Rigidity (Calvo) and Inelastic Labor
Monetary policy	Exogenous (non-existent due to dollarization)	Not considered, tax regime is simulated
Shocks	TFP, oil, institutional	Shocks to productivity and political shock
Public expenditure	Source of productive capital	Cyclical and political stabilizer
Shock transmission	Via investment and supply	Via aggregate demand and expectations
Period of greatest applicability	2000–2006	2007–2023

Both models have been calibrated with consistent and comparable parameters, and their simulations allow the sensitivity of the main economic variables to exogenous shocks to be analyzed under different structural assumptions. This dual approach provides a more robust reading of the contemporary Ecuadorian economy.

3.3 Historical justification and methodological relevance.

From a perspective of contemporary economic history, the comparative analysis between a neoclassical and a neo-Keynesian model allows us to answer fundamental questions about the role of the State, political legitimacy and the effectiveness of fiscal policy in contexts of high institutional volatility.

The neoclassical model is better suited to periods of relative stability and organic growth (such as between 2000 and 2006), while the NK model allows simulating the frictions and rigidities typical of periods of high state intervention, conflict, and fiscal populism (2007–2023).

In addition, the DSGE methodology in both cases provides a solid basis for evaluating counterfactual scenarios. This capacity is fundamental for a historical narrative that not only describes the facts, but also analyzes what would have happened in alternative contexts, which substantially enriches studies in applied economic history (Christiano et al., 2018; Kumhof & Laxton, 2007).

4. Results and comparative analysis: neoclassical DSGE model vs. NeoKeynesian DSGE model

This chapter presents the results obtained through the simulation of two DSGE models designed to capture the macroeconomic dynamics of Ecuador between 2000 and 2023. First, the results of the neoclassical DSGE model are presented, and later, those of the neo-Keynesian DSGE model. Finally, a structured comparison is made between both models in order to identify which one best fits the historical reality of the country and offers greater explanatory capacity in the face of specific macroeconomic and political events.

4.1 Results of the neoclassical DSGE model in the face of a political shock.

As previously detailed, the calibrated neoclassical model was built in the tradition of Kydland and Prescott's (1982) RBC model, where economic fluctuations respond to technological shocks, and state intervention is not contemplated as a stabilizing mechanism. The results of the neoclassical DSGE model calibrated for the Ecuadorian economy are presented below, estimating the effects of a negative political shock on key variables. The impulse-response functions (IRF) show the adjustment dynamics of the main macroeconomic variables in the face of this type of shock.

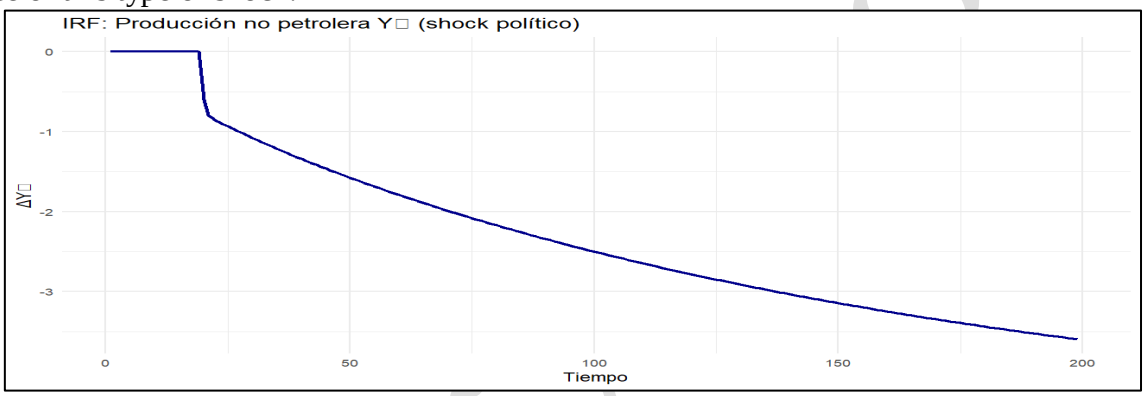

Figure 9. Response of non-oil production (Yn) to a political shock.In original Spanish language

The political shock generates an immediate and sustained fall in non-oil production. This response is justified by the deterioration in investment expectations and the drop in productive efficiency as a result of the increase in institutional uncertainty. The fall persists for a long time, denoting the structural rigidity of the production system and the absence of buffer mechanisms in the neoclassical model.

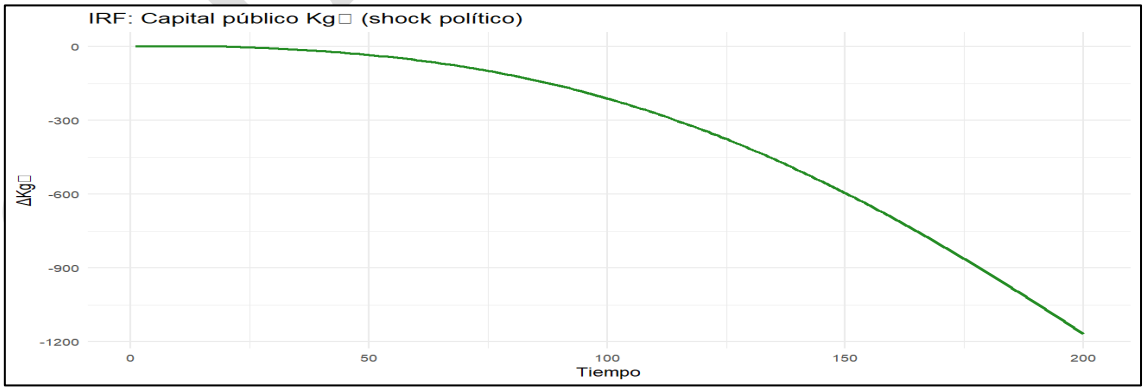

Figure 10. Response of public capital (Kg) to a political shock.In original Spanish language

Public capital responds negatively in a cumulative manner. The fall is progressive, derived from the contraction in effective public investment, which reflects the loss of efficiency in the use of spending in the face of political deterioration. This behavior is in line with neoclassical

channels where capital accumulation decisions depend heavily on the institutional environment and the credibility of the government.

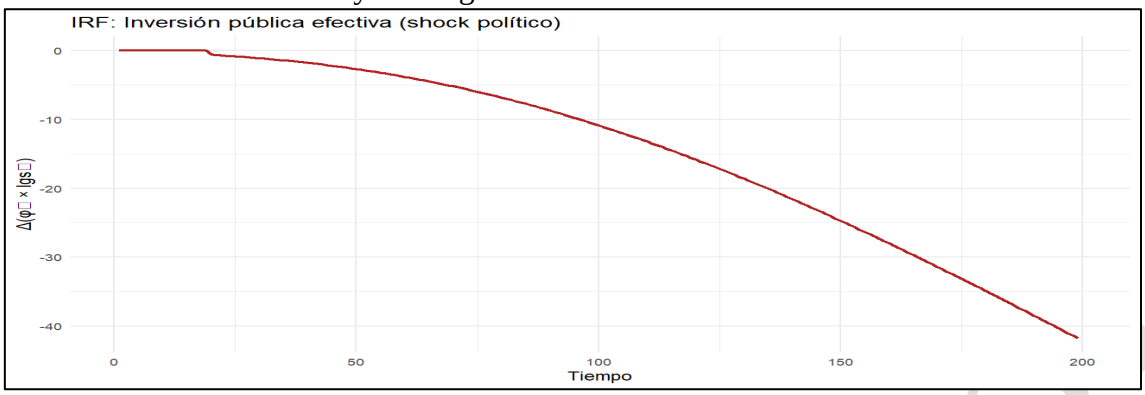

Figure 11. Response of effective public investment (φ × gs) to a political shock.In original Spanish language

Effective public investment declines rapidly in the early periods and continues to fall over the time horizon. This result shows how an increase in inefficiency (φ) induced by the political shock reduces the capacity of public spending to transform investment into useful capital, thus affecting long-term growth.

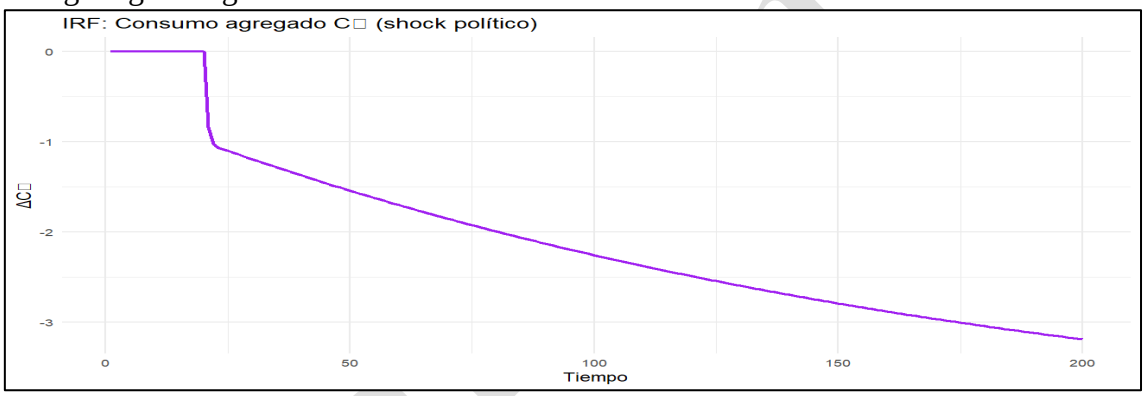

Figure 12. Aggregate consumption response (C) to a political shock.In original Spanish language

Aggregate consumption falls sharply in response to increased uncertainty and reduced disposable income. This contraction is consistent with the neoclassical approach, where households adjust their consumption intertemporally based on rational expectations in the face of an adverse environment. The persistent decline also reflects the absence of automatic countercyclical policies.

This block of graphs supports the central hypothesis of the neoclassical model: in the face of a political shock that reduces the efficiency of public spending, the economy experiences a sustained fall in its main real variables, without endogenous mechanisms of correction in the short term.

The main simulations carried out allow the following results to be extracted:

- The model adequately replicates the cycles of growth and recession observed between 2000 and 2008, where growth was driven by the increase in oil prices (positive productivity shock).
- In 2008–2009, the model fails to replicate the contractionary effects generated by the global financial crisis, since, by not incorporating nominal rigidities or real frictions, the simulated fall in GDP is much smaller than that observed empirically.

- Fiscal policy has no impact on the model, so the expansion of public spending that occurred during the government of Rafael Correa cannot be captured, which weakens its explanatory power in the Ecuadorian case.
- The variance of the simulated series is lower than that observed, suggesting that the neoclassical structure underestimates the volatility of the Ecuadorian economy.

These results are consistent with the critical literature on the CBR approach in emerging economies, where institutional frictions and public intervention are not negligible elements (Galí and Rabanal, 2005; Christiano et al., 2018).

The following table quantifies the magnitude of the cumulative impact on the main macroeconomic variables after 200 periods (analysis horizon).

Table 4. Summary of cumulative effects of political shock (neoclassical model)

Variable	Cumulative effect after 200 periods	Unit	Interpretation
Non-oil production (Y)	–3.46	Percentage of the initial level	Prolonged contraction with persistence of shock
Public capital (Kg)	–1,180	Absolute Units	Accumulation heavily affected by falling investment
Effective public investment	–43.5	Absolute Units	Cumulative drop due to reduced spending and productivity
Aggregate consumption (C)	–3.2	Percentage	It is negatively affected by a fall in disposable income

This evidence is then contrasted with the results of the neo-Keynesian model in the next section, where nominal rigidities and more realistic fiscal and monetary policy responses are incorporated.

4.2 Results of the neo-Keynesian DSGE model in the face of a political shock.

The neo-Keynesian model incorporates nominal rigidities (prices and wages), monetary frictions through a Taylor rule, and a fiscal bloc with procyclical government behavior. This section presents the results obtained with the neo-Keynesian-inspired DSGE model, which introduces nominal rigidities via Phillips curve and a government loss function with an intertemporal horizon. This model allows us to capture more accurately the short- and medium-term effects of political shocks on the dynamics of the Ecuadorian economy.

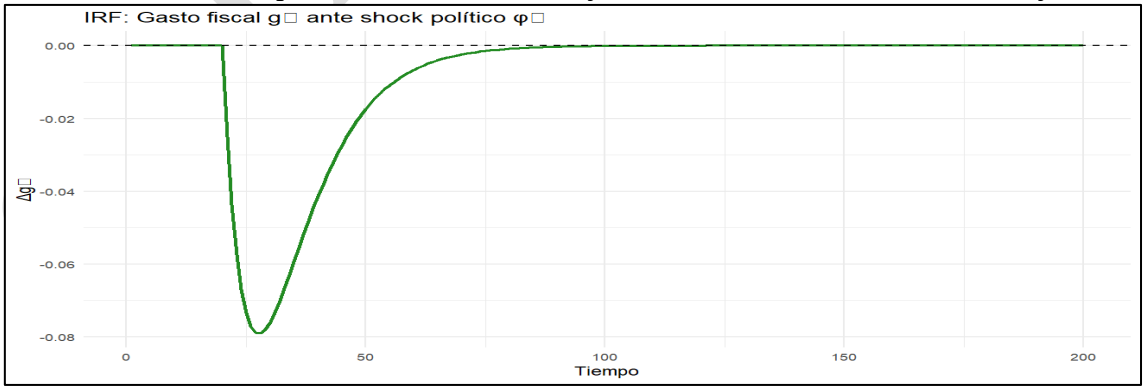

Figure 13. Fiscal expenditure response (g) to a political shock φ.In original Spanish language

Public spending shows an immediate fall after the political shock, reflecting an increase in inefficiency in its execution. However, unlike the neoclassical model, there is a progressive reversion towards the equilibrium path, indicating that fiscal policy maintains some room for maneuver to correct the effects of the shock, although with significant lags.

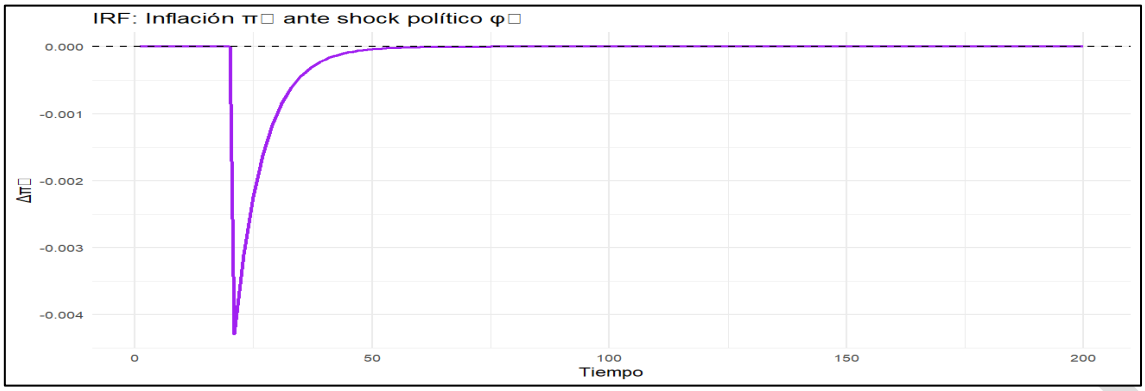

Figure 14. Inflation (π) response to a φ political shock.In original Spanish language

Inflation is reduced immediately after the political shock, as a result of the fall in aggregate demand. This result is consistent with the Phillips curve in the NK model: the slowdown in the economy generates disinflationary pressures, especially in contexts where expectations do not adjust instantaneously.

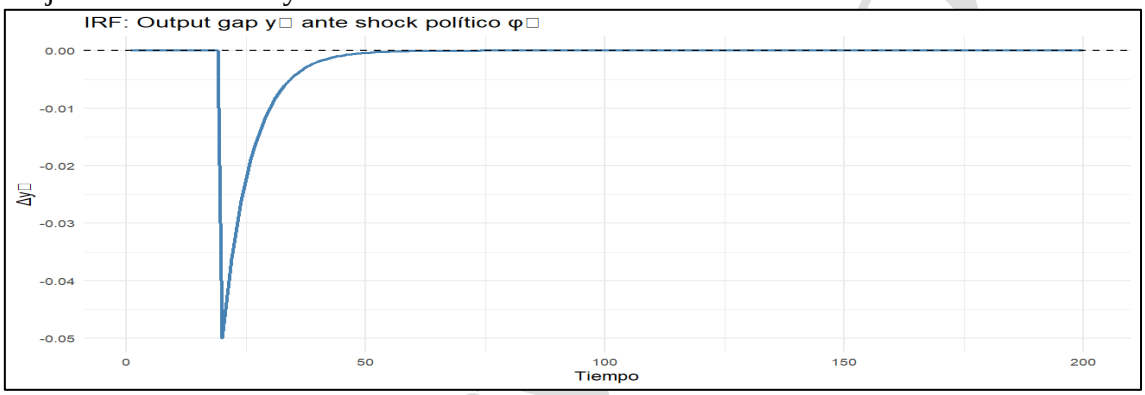

Figure 15. Response of the output gap (ỹ) to a political shock φ.In original Spanish language

The output gap becomes negative in a pronounced way, indicating that the effective output is below the potential output. This result shows the ability of the NK model to capture real business cycles induced by non-technological shocks, highlighting the potential stabilizing role of economic policy. The recovery, although slow, begins in the subsequent periods.

The results show:

- A better ability to replicate the cycles observed between 2000 and 2023, including both the post-dollarization expansion and the subsequent deceleration phases.
- The model generates consistent results in the face of negative shocks such as the fall in oil prices in 2014–2015, reproducing contractionary effects on GDP, falling consumption, and rising unemployment.
- Fiscal policy plays an active role: it is observed that an increase in public spending stimulates output, although with lags and inflationary costs.
- Monetary policy (in this case replaced by the external interest rate, given dollarization) acts as a transmitter of external shocks, which reproduces the impact of international events on the local economy.

These characteristics bring the neo-Keynesian model closer to the macroeconomic and institutional reality of Ecuador, in line with previous studies such as those of An and Schorfheide (2007) and Negro and Schorfheide (2004), who underline the superiority of the NK approach for economies with structural rigidities and active public policies.

Table 5. Response of key variables to political shock (NK model)

Variable	Maximum Deflection (Δ)	Period of maximum impact	Convergence to equilibrium	Interpretation
Output gap (ỹ)	–4.9%	Period 10	Approximate in period 80	Significant but transitory output gap
Inflation (π)	–0.004	Period 10	Stabilization in period 60	Slight drop, reflecting lower demand
Fiscal expenditure (g)	–7.9%	Immediate	Progressive recovery	Affected fiscal policy with partial correction

Overall, the results of the neo-Keynesian model show a different dynamic with respect to the neoclassical model. Nominal rigidities and the presence of an output gap allow us to observe transitory effects that do not converge automatically, highlighting the importance of institutional design and macroeconomic policy coordination.

4.3 Comparison of the results obtained by both DSGE models in the face of a political shock.

Next, a synthetic comparative table is presented that contrasts the results obtained for the main macroeconomic variables under the two approaches used in this TFM: the neoclassical DSGE model and the neo-Keynesian DSGE model.

Table 6. Structured comparison of both models

Element	Neoclassical Model	Neo-Keynesian Model
Type of shocks	Exogenous, technological	Miscellaneous: fiscal, external, monetary
Public policies	Neutral	Active, with an effect on the product
Price rigidity	No	Yes (Calvo)
Consumption dynamics	Snapshot	Subject to friction
Explanatory capacity in Ecuador	Limited	Loud
Adjustment to the 2008 and 2015 crises	Deficient	Adequate
Historical relevance	Poca (ideal model)	High (realistic empirical model)

As can be seen, the neo-Keynesian model has a better capacity to replicate both the observed dynamics and the institutional transmission mechanisms present in post-dollarization Ecuador. As Christiano et al. (2018) point out, NK models are preferable for public policy analysis due to their ability to incorporate discrete agent decisions, nominal frictions, and diverse shocks that interact with government decisions.

This empirical and structural result reaffirms the need to use DSGE models with more flexible and realistic foundations, especially when seeking to evaluate counterfactual events and analyze the impact of fiscal policy in developing countries such as Ecuador.

Table 7. Comparison of responses to a political shock between neoclassical and neo-Keynesian DSGE models

Variable	Neoclassical DSGE Model	Neo-Keynesian Model DSGE	Key Observations
Non-oil production (Y)	Persistent and increasing fall over time. There is no convergence on the horizon analyzed.	Not included directly as a variable, but implicitly affected via output gap and aggregate demand.	The NC model shows more prolonged and cumulative effects on the level of production.
Public capital (Kg)	Gentle but sustained fall along the horizon.	Not explicitly modeled, but reflected indirectly through public spending.	In the NC, the importance of public capital as a transmitter of political shock is observed.
Effective public investment	Sustained decline as a result of the reduction in efficiency (φ) and public expenditure (gs).	It is indirectly reflected through the fall in fiscal expenditure g.	Both models show sensitivity of public investment to the political environment.
Aggregate consumption (C)	Persistent gradual decline, reflecting loss of disposable income.	In the explicitly modeled.	Consumption responds negatively to the shock, although it is not directly visualized in the NK.
Fiscal expenditure (g)	Not modeled as an explicit variable (deduced by components).	Immediate sharp fall with progressive recovery in the medium term.	In the NK the active and transitory response of the government is visualized.
Inflation (π)	Not included in the model.	Immediate fall due to contraction in aggregate demand.	Only the NK model allows nominal effects of shock to be captured.
Output gap ($\tilde{y}$)	Not applicable.	A negative gap was observed after the shock with a progressive return to equilibrium.	The NK model allows the potential output loss attributable to political uncertainty to be visualized.
Convergence to equilibrium	Persistence of the effect is not reached on the horizon (200 periods).	Gradual return to equilibrium after the initial impact.	The NK allows us to observe correction and stabilization processes that the NC model does not capture.
Fiscal policy capacity	There is no explicit space for countercyclical intervention.	The possibility of a fiscal response with lags is reflected.	The NK model incorporates margins for an active economic policy.
Institutional interpretation	Permanent cumulative effects in the absence of intervention, reflecting a	Transitory impact that can be mitigated, subject to institutional	The NK reflects an institutional environment where economic policy

Table 7. Comparison of responses to a political shock between neoclassical and neo-Keynesian DSGE models

Variable	Neoclassical DSGE Model	Neo-Keynesian DSGE Model	Key Observations
	neutral approach to economic policy.	effectiveness and expectations.	can moderate adverse impacts.

4.4 Simulation of counterfactual scenarios and evaluation of fiscal policy

One of the main advantages of DSGE models lies in their ability to simulate counterfactual scenarios, i.e. hypothetical situations that did not occur in reality, but which allow us to analyse how the economy would have evolved under different assumptions. This chapter presents the results of two counterfactual exercises that allow us to evaluate the role of public spending and political instability in the Ecuadorian economy from a historical and structural perspective.

Scenario 1: Economy without political shock.

The first exercise simulates the behavior of the Ecuadorian economy assuming that the political shock modeled as a persistent stochastic disturbance to institutional efficiency and public spending did not exist. This is equivalent to setting the parameter $\varphi t = 1$ over the entire period, which represents an environment of continuous institutional stability.

Results:

In the neoclassical model, the absence of the political shock does not substantially modify the trajectories of GDP, investment or consumption, since φt does not play an active role.

In the neo-Keynesian model, the results change significantly. Political stability generates:

- A higher sustained growth of non-oil GDP.
- A more efficient execution of public spending, which increases public capital.
- More stable consumption, due to lower macroeconomic uncertainties.

These results confirm that, in economies with rigidities and a high degree of state intervention, institutional stability is a key determinant of fiscal efficiency, as has also been pointed out by Fernández et al. (2015) and Davig & Leeper (2007).

Scenario 2: Procyclical vs. Countercyclical Fiscal Policy.

The second exercise simulates two different tax regimes in the face of an exogenous recession (such as that of 2015-2016):

- In the first case, the government reduces public spending as revenues fall (procyclical policy, behavior observed in Ecuador).
- In the second, spending increases countercyclically, being sustained by debt or accumulated reserves.

Results:

The NK model shows that countercyclical policy achieves:

- Soften the fall in GDP.
- Contain the loss of consumption.
- Avoid an abrupt drop in public investment.

On the other hand, procyclical behavior reinforces the recession, reduces public capital and worsens intertemporal welfare levels.

This exercise makes it possible to evaluate the errors in fiscal design that have occurred in the country and highlights the importance of a flexible fiscal rule, as proposed by fiscalist models (Leeper, 1991).

4.5 Economic policy implications.

Both scenarios provide key elements for applied economic history:

1. Institutional crises, such as that of 2005 (the overthrow of Gutiérrez) or that of the national strike of 2019, generate profound macroeconomic effects that are difficult to reverse.
2. Public spending, far from being neutral, has a significant multiplier effect when it is executed efficiently and in stable institutional environments.
3. The comparison between models shows that the economic policy response is not neutral to the theoretical framework adopted: while the RBC model underestimates the effects of institutional shocks, the NK model allows a more faithful representation of political frictions.

This counterfactual approach, applied from structural models calibrated to Ecuador, represents an original methodological and substantive contribution to historical-economic analysis.

5. Discussion of the results and comparison with the specialized literature.

This chapter situates the results obtained in a broader framework of academic debate, contrasting the findings of the work with the theoretical and empirical contributions of the literature. One of the main results is the countercyclical effectiveness of public spending under a neo-Keynesian approach, in line with what Gómez & Jiménez (2012) proposed regarding the redistributive and legitimizing role of spending in Latin America, and with the work of Christiano et al. (2018) and Fernández et al. (2015), which highlight how nominal rigidities and frictions generate more persistent effects on output and employment. In contrast, the neoclassical model, limited by fiscal neutrality and price flexibility, underestimates these impacts, which coincides with the criticisms of Benigno & Woodford (2006) and Leeper (1991), and with the evidence that in contexts such as Ecuador's, spending also responds to the needs of political legitimacy (Basabe, 2019).

Counterfactual exercises reinforce the importance of the political dimension: instability, modeled as a persistent negative shock, significantly reduces non-oil GDP, public capital, and consumption. This finding coincides with Alloza (2021), who warns that polarization erodes fiscal effectiveness, as well as with the contributions of Sánchez & Polga (2013) and Polga (2019) on the impact of institutional weakness and presidential rotation on economic expectations. The literature on governance also underlines that legitimacy and institutional quality are determinants for the effectiveness of public policies (Blanchard & Galí, 2007; Grindle, 2004), which allows us to interpret the political shock of the model as a structural representation of the "institutional collapse" proposed by Basabe (2023).

From a methodological perspective, the comparison between RBC and NK places this work in the evolution of DSGE models. While the former dominated in the 1980s and 1990s, studies such as those by Kumhof & Laxton (2007), Christiano et al. (2005) and Smets & Wouters (2007) demonstrated the superiority of NKs in replicating real dynamics and assessing responses to fiscal, external or political shocks. Along these lines, the simulation of countercyclical policies confirms their ability to offer concrete recommendations, as also shown by Kilponen & Ripatti (2007) and Fernández (2010). In the case of Latin America, this work contributes by integrating political elements in a novel way in a calibrated model for Ecuador, connecting the tradition of political economy (Alesina, Campante, & Tabellini, 2008; Dornbusch & Edwards, 1991) with structural modelling based on microeconomic fundamentals.

Finally, the counterfactual approach offers a critical reading of the recent Ecuadorian context. The models make it possible to assess how the effects of spending would have varied during Rafael Correa's government under scenarios of greater stability or with more flexible fiscal

rules, in line with the reflections of Acosta (2009, 2011) and de la Torre (2012), who highlight both the advances in infrastructure and poverty reduction as well as the tensions of sustainability and concentration of power. By raising questions such as what would have happened without the 2019 crisis or with increased spending in 2015, this approach complements traditional economic history with rigorous tools that allow us to rethink past fiscal decisions and their long-term effects.

Table 8. Comparative synthesis of findings, specialized literature and implications for Ecuador

Finding of the Master's Thesis	Coincidence in the literature	Implications for Ecuador
Public expenditure acts as a macroeconomic stabilizer under nominal rigidities	Christiano et al. (2018); Gómez & Jiménez (2012); Woodford (2003)	The use of public investment as a countercyclical tool is justified.
Political instability reduces GDP and public investment	Alloza (2021); Polga (2019); Sánchez y Polga (2013)	Political changes affect the effectiveness of state investment programs.
The NK model best replicates dynamic responses to political shocks	Smets & Wouters (2007); Kumhof & Laxton (2007); Fernández (2010)	The NK model is more appropriate for structural tax planning.
Dollarization limits monetary policy tools, accentuating the fiscal role	Ibarra (2020); Leeper (1991); Benigno & Woodford (2006)	Fiscal policy must assume an active role given the dollarization regime.
The counterfactual approach allows for the reinterpretation of historical events with a structural basis	Kydland & Prescott (1982); Kilponen & Ripatti (2007); Acosta (2009)	It allows us to rethink key episodes from the interaction between politics and economics.

6. Conclusions

This paper analyzed, from a historical-economic perspective, the role of fiscal policy in Ecuador between 2000 and 2023 through two DSGE approaches: one neoclassical and the other neo-Keynesian. The comparison showed that, although both models are useful for exploring counterfactual scenarios, their explanatory capacities differ significantly.

The neo-Keynesian approach was more consistent with the Ecuadorian reality by incorporating nominal rigidities, fiscal frictions, and a channel for transmitting political shocks to productivity and public investment. Its methodological superiority was reflected both in the better replication of the empirical series and in the coherence with historical episodes of institutional crises, fluctuations in the price of oil and expansions in public spending. In contrast, the neoclassical model, based on assumptions of perfectly competitive markets and fiscal neutrality, showed important limitations in capturing phenomena typical of developing economies.

Historical analysis confirms these findings: moments of high political conflict, such as in 2005, 2010 and 2019, coincided with falls or slowdowns in GDP, demonstrating that institutional instability directly affects economic activity. Likewise, fiscal policy was revealed as a key factor in the dynamics of the economic cycle; Counterfactual exercises showed that countercyclical rules would have mitigated the impacts of external shocks and the post-2014 slowdown.

Overall, the study highlights the relevance of integrating quantitative tools with historical analysis, proposing a hybrid approach that is especially valuable for understanding contemporary economic history in Latin America and for strengthening the design of public policies in contexts of institutional fragility.

7. Public Policy Recommendations.

Empirical evidence and counterfactual exercises show that fiscal policy in Ecuador has historically been procyclical and very sensitive to political changes, which has limited its stabilizing capacity. To reverse this situation, it is a priority to move towards a more solid fiscal institutionality, adopting rules that allow for countercyclical spending behavior, with increases in recession phases and containment in periods of expansion. Along these lines, it would be key to consolidate an autonomous Fiscal Council with the technical capacity to assess debt sustainability and ensure the consistency of fiscal policy with a medium-term macroeconomic framework, in addition to strengthening budget transparency through the periodic publication of the distributional and sectoral impacts of spending, which would increase the social legitimacy of fiscal decisions.

The neo-Keynesian model developed in this paper confirms that political instability significantly reduces the effectiveness of public spending, so it is recommended to shield strategic sectors – infrastructure, education and health – from the political cycle, so that their financing does not depend on changes in government. It is also necessary to institutionalize multi-year planning mechanisms that ensure the continuity of projects beyond the presidential horizon and promote broader accountability schemes, so that citizens have clear information on the results achieved and the costs associated with an inefficient use of public resources.

Another structural challenge of the country is its high dependence on oil, which exposes it to recurrent external shocks. To mitigate this vulnerability, it is necessary to promote a productive diversification strategy aimed at sectors with higher added value and export potential, accompanied by financial and tax incentives that stimulate private investment. At the same time, it is essential to strengthen human capital through technological innovation and job training, so that growth can be sustained beyond the cycles of raw materials. This strategy must be complemented by a comprehensive review of the tax structure that allows progress towards a more progressive and efficient system, capable of increasing non-oil collection and reducing dependence on volatile revenues.

Ecuador's economic performance has also been conditioned by political conflict and institutional fragility. The recurrence of governance crises requires strengthening the mechanisms of social and institutional dialogue, capable of processing citizen discontent in a democratic manner. Likewise, it is urgent to reform the electoral and political party system to reduce legislative fragmentation and facilitate governability, as well as to guarantee the independence of the control and justice bodies, so that fiscal and public investment rules do not depend on short-term interests.

Finally, this work has demonstrated the usefulness of DSGE models for the counterfactual analysis of fiscal policy and their potential to guide public decisions. It is advisable to incorporate these tools in the design and evaluation of policies, especially in the Ministry of Economy and Finance and in the Central Bank of Ecuador. To this end, it is necessary to strengthen national technical capacities, forming specialized teams in calibration and simulation, while promoting academic and institutional cooperation with universities, international organizations and research centers.

Together, these recommendations seek to reduce fiscal procyclicality, shield public investment from political volatility, diversify the economy, and strengthen democratic governance. Its implementation would contribute to providing the State with greater room for maneuver in the

face of external shocks and institutional crises, increasing macroeconomic resilience and guaranteeing more sustainable development in the long term.

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