A Difference-in-Differences Analysis of The Long-Term Impact of Dollarisation on Economic Growth and Stability in Latin American Economies.

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Abstract

This dissertation explores Ecuador's adoption of the United States Dollar in 2000, discussing its benefits, disadvantages, and performance during global shocks like the COVID-19 pandemic. Where existing research examines various impacts of dollarisation, this paper contributes by investigating the long-run implications for macroeconomic factors like GDP, inflation, and unemployment. The study uses panel data from 1990 to 2023, and a Difference-in-Differences model, creating an interaction term capturing the dollarisation effect, allowing for comparative analysis between Latin American dollarised and non-dollarised economies. The findings suggest dollarisation sustained stability both initially and in the long term compared to non-dollarised economies. However, it did not significantly impact unemployment and foreign investment. Moreover, the study highlights that to maximise its benefits of dollarisation, a solid framework must be implemented in the financial and economic institutions, as well as discipline.

AI Statement

I acknowledge the use of generative AI in code development, specifically coding errors in this paper. However, the work reported remains my own.

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1. Introduction

In developing countries in Latin America and other continents, there is constant instability and reduced growth and development opportunities due to decades of political instability, lack of institutional and governmental discipline and corruption. This is a compelling topic in international economics as dollarisation is a rare and occasionally controversial decision of developing economies lacking financial discipline and economic management. This highlights the continued dependence on stronger developed economies like the United States. It also reinforces the dominance of certain economies like the United States in international trade and finance. Ecuador's adoption of the US dollar in 2000 was a significant event in the country's economic history, following a difficult period of hyperinflation and financial unrest.

In the late 1990s, Ecuador experienced one of its worst economic crises due to the collapse of the banking system and the after-effects of the natural disaster El Niño, blamed on institutional weaknesses, overdependence on oil exports and high government spending. This led to a sharp contraction in economic growth, increased vulnerability and social unrest.

Dollarisation provides stability by tying a stronger currency, but it comes with a sacrifice of control over monetary policy. Due to this significant economic cost, few countries have adopted this policy, however, Ecuador is one of the few economies that has maintained a dollarised economy for 25 years. This leads to the question: Has dollarisation helped or impeded Ecuador's economy? Has it sustained the initial benefits? How has Ecuador managed without monetary sovereignty? How does Ecuador's experience compare to that of non-dollarised Latin American economies?

While dollarisation is recognised for its immediate and significant benefits on stabilisation, the long-term impact on stability and growth has not been profoundly analysed, especially in economies with political instability and overreliance on commodity exports. Most research is conducted shortly after the adoption of the dollar, and recent papers reference datasets from that period. Although there has been recent research conducted with updated datasets, there remain gaps in the long-term impact of 25 years post-dollarisation and whether dollarisation has aided Ecuador during global events like the coronavirus pandemic.

This dissertation aims to investigate the impact of dollarisation on Ecuador's growth and stability since its implementation in 2000, highlighting Ecuador's experience during the COVID-19 pandemic. Additionally, this paper analyses a wider range of datasets, including more recently available data, to investigate Ecuador's experience compared to non-dollarised

countries. Another objective is to investigate the long-term impacts by applying a Difference-In-Differences regression model to compare the macroeconomic effects on dollarised compared to non-dollarised economies across time. This dissertation aims to conduct a more in-depth comparative analysis and use recent global events and their experiences for further comparison. This paper reviews existing literature discussing whether dollarisation provides long and short-term stability for economies experiencing economic instability and volatility.

The paper finds that dollarisation did provide and continues to provide stability benefits in dollarised economies. This was also true during the pandemic, dollarised economies had lower inflationary pressures compared to non-dollarised economies, highlighting the stability during global shocks. However, this is not to say that it also provided significant benefits for unemployment rates. Reviewing previous research, the effects on growth remain undecided, whereas this study indicated positive effects on GDP growth. This information is vital in providing insights into the experiences of dollarised economies and their sustainable benefits.

2. Historical Background

Ecuador is recognised for implementing dollarisation as its official currency, transitioning from the Ecuadorian Sucre to the US dollar in 2000. In the 1990s, Ecuador experienced one of the most devastating crises in its economic history, reaching inflation rates of 96.10%, constant devaluation of the Sucre, reaching an exchange rate of 1 USD equivalent to 18,000 sucres (Gachet, Maldonado and Pérez, 2008) (Cueva and Díaz, 2021). Years of political instability, financial institution collapses and uncertainty across the country. As a result, the government adopted the United States dollar as its official currency in 2000, sacrificing its national currency to stabilise the economy.

Dollarisation involves a country abandoning its domestic currency in favour of a more stable one, most commonly the US dollar, as its official currency or pegging it to the dollar for stability in economic functions such as medium of exchange and store of value. However, this decision renounces the ability to conduct an independent monetary policy, as the United States Central Bank controls the printing and supply of the dollar, limiting the flexibility to respond to economic crises and shocks.

The decision to dollarise followed years of instability and high inflation, following oil price shocks in the 1980s resulting from Arab-Israeli wars. The main export is oil commodities, therefore, it becomes highly dependent on oil and vulnerable to external shocks like oil

discoveries in Saudi Arabia and the United States. The government intervened by implementing austerity policies, devaluing the sucre repeatedly, reducing public spending and subsidies, and liberalising trade. However, while aiming to restore fiscal balance, this resulted in social unrest due to reduced public spending affecting the lower class and intensifying political turmoil. The constant devaluation of the Sucre resulted in increased currency volatility and worsened the trade balance, therefore, dollarisation appeared to be the only sustainable option to recover stability and confidence in the economy.

It is argued that flexible exchange rate regimes are more likely to be associated with a higher growth rate (Levy-Yeyati and Sturzenegger, 2001). Although Ecuador had a flexible regime and devalued the Sucre, it could be argued that strong economic institutions are vital for responding to shocks, an area in which Ecuador failed.

In addition, Ecuador experienced the natural disaster El Niño, negatively impacting the agricultural sector, costing the economy around 13% of its GDP, further increasing levels of government spending and therefore, worsening the country's external debt (Ecuador and the IMF -- Address by Stanley Fischer, 2000). Alongside natural disasters and oil price shocks, Ecuador's weak institutions primarily resulted in the collapse of its banking system, with 16 out of 40 existing banks involved in a financial crisis, due to "policy-induced shocks" resulting in a loss of confidence in financial institutions, and increased public debt (Jácome, 2004).

An understanding of the complicated economic and political situation that Ecuador was experiencing, which resulted in dollarisation, is fundamental to analysing and evaluating the impact on growth and stability in the long term, as investigated in this study.

3. Theoretical Foundations and Literature Review

3.1. Theoretical Foundations

The adoption of dollarisation links with fundamental economic theories on exchange rate regimes, monetary sovereignty and "The Impossible Trinity". This derives from the Mundell-Fleming model. (Fleming, 1962) theorises that a country cannot simultaneously sustain free capital mobility, a fixed exchange rate and an independent monetary policy. In an open economy, policymakers must choose between controlling its nominal exchange rate or an independent monetary policy to achieve growth and stability.

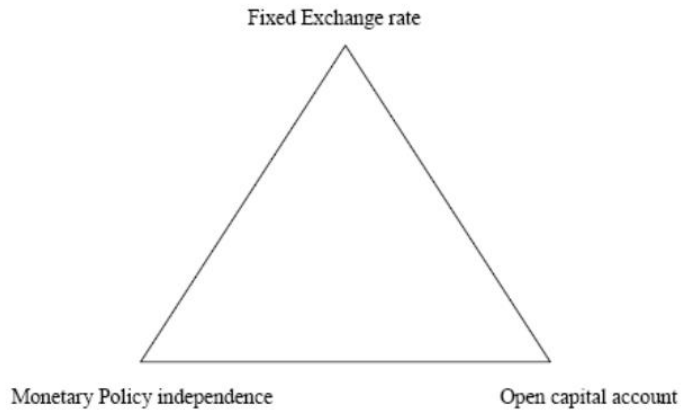

Figure 1- ***Source: University of Kent ECON5480 International Finance Module***

Ecuador's dollarisation illustrates this as the country sacrificed control over their independent monetary policy for stable exchange rates and increased access to international markets. The Mundell-Fleming model highlights how adopting a foreign currency limits the use of monetary policy to respond to external shocks, influencing how an economy responds. (Fischer, 2001) proposes that a hard peg is appropriate for economies with persistent monetary instability in the long term. This follows the impactful decline in intermediate exchange rate regimes like soft pegs in the 1990s. Soft pegs appeared to create credibility issues and increased exposure to speculative attacks following financial crises in Mexico and Brazil due to lasting volatility. (Calvo and Reinhart, 2002) emphasises that the lasting volatility of domestic currencies creates potential losses of credibility. Conversely, hard pegs and dollarisation were more resilient when experiencing shocks.

To include the significance of fiscal deficits, some have extended the model to discuss how monetary policy can result in negative effects on an economy. (Ortiz and Rodríguez, 2002) Applies the model to Argentina’s experience in the 1990s and demonstrates how expansionary monetary policy can reduce output levels by triggering country risk and increasing interest rates, unlike the traditional Mundell-Fleming model. Dollarisation is recognised to recover economic discipline and to prevent inflationary pressures from overprinting currency, as seen in Venezuela, with significant hyperinflation. However, there are significant trade-offs, including the ability to utilise monetary policy, hence, relying further on fiscal policy and external borrowing.

3.2 Empirical Literature On Dollarisation

The literature review will examine the existing literature that discusses the effects and implementation of dollarisation. There has been a reasonable amount of research on dollarisation and dollarisation in Ecuador, however, those related to Ecuador and El Salvador were published closer to the time of the adoption of the dollar. Therefore, previous and recent papers do not deeply investigate the effects of later events, such as the pandemic and discuss whether it was a smoother experience for dollarised economies. The main concept from the literature explains the benefits of implementing another country's currency, like stabilisation and the drawbacks, such as the loss of control over monetary policy.

Benefits of Dollarisation

Dollarisation has been recognised highly for providing macroeconomic stability, by reducing hyperinflation through the hard peg to the US dollar, whilst removing the ability and risks of overprinting domestic currency (Quispe-Agnoli and Whisler, 2006). This was evident when Ecuador was experiencing levels of inflation greater than 90% in 1998, after experiencing various economic crises, and post-dollarisation, inflation reduced to single-digit figures in 2002, two years after dollarisation (Andrea Bonilla-Bolaños and Diego Villacreses, 2023). In Ecuador, inflation has reduced significantly, and growth stability has improved, although it remains vulnerable due to overreliance on oil exports and limited economic diversification. While dollarisation stabilises exchange rate volatility, allowing a stable groundwork for foreign direct investment, dollarisation alone cannot protect against external shocks (Edwards and Magendzo, 2006). This has led to a reinforcement of the importance of complementary policies and controls.

Studies have previously analysed the macroeconomic impact of dollarisation based on the Optimum Currency Area (OCA) theory, detailing that there exist specific regions in which a currency is most effective. (Andrea Bonilla-Bolaños and Diego Villacreses, 2023) found that post-dollarisation, there was strong synchronisation with the US inflation rates using an Augmented Dickey-Fuller Test. This indicates that Ecuador's dependence on the United States' monetary policy increased as it became more susceptible to changes.

On the contrary, the impact on economic growth is less determined and significant. (Koráb, Fidrmuc and Dibooglu, 2023) found, by conducting a meta-analysis, that dollarisation effects

on growth were neutral, as some economies experienced greater growth due to increased investor and consumer confidence. Whereas others experienced economic slowdowns due to different economic structures and institutional quality. The authors discussed that the long-term benefits of dollarisation depend heavily on the quality of institutions and political stability. Similarly, in Ecuador, the weak institutions and poor economic management that resulted in greater public debt have hindered the benefits of dollarisation (Llapa, 2022). Furthermore, as Ecuador primarily depends on oil exports, they are susceptible to external shocks, which would typically be managed through monetary policy, which the country sacrificed, resulting in Ecuador's continuous struggle to respond to shocks efficiently. These findings highlight the importance of how institutional and fiscal discipline factors affect the benefits of dollarisation.

Disadvantages of Dollarisation

Despite its benefits, the principal criticism of dollarisation is the loss of independent monetary policy. With this loss, dollarised economies cannot control the money supply nor adjust exchange rates in response to economic shocks (Borensztein and Berg, 2000). With dollarisation, there is stronger economic integration with the United States, which also becomes dependent on their decisions (Castillo-Ponce, Truong and Rodriguez-Espinosa, 2021). This hinders the ability to manage and stimulate the economy and manage external shocks. In Ecuador's case, the inability to adjust the currency in response to oil price shocks has led to dependence on alternative policies like fiscal and external borrowing, resulting in greater public debt. (Frankel, 1999) discusses that monetary policy loses its ability when there is control over fixed exchange rates and financial market integration, and when home interest rates are pegged to foreign interest rates. As the control over monetary policy response is relinquished, money supply expansions flow rapidly from any deficits in the balance of payments.

As dollarised economies sacrifice the ability to devalue the currency, this reduces direct investment and international trade, reducing international competitiveness. As Ecuador cannot control its currency, with its high dependence on oil exports, countries may resort to importing commodities from OECD countries with weaker currencies to maximise the quantity of oil for a price per unit. Without control over currency, it puts downward pressure on wages and prices, aiming to restore competitiveness, however, it could lead to higher unemployment rates and lower productivity. Before dollarisation, overvalued currencies created inflexibility, limiting effective responses to external shocks, and resulting in unsustainable deficits in the currency account (Rodrik, 2008).

Additionally, dollarisation also means the loss of monetary sovereignty. When an economy adopts a foreign currency, it sacrifices its independent control over monetary tools like determining exchange rates and inflation rates (Winkler *et al.*, 2004). Consequently, this limits the ability to respond to economic events, as this sacrifice is strongly outlined by the Trilemma (Fleming, 1962) (Mundell, 1960).

However, some argue that this trade-off is beneficial for economies with a history of instability and monetary discipline. Dollarisation provides reliability to monetary and fiscal policies, especially in economies that lack financial discipline (Calvo and Reinhart, 2002).

Although dollarisation can incentivise stronger economic integration and investment with stronger developed countries like the United States, it can also introduce inflexibility due to significant variations in economic structures, these economies may not fully benefit (Borensztein and Berg, 2000). This is essentially for developing countries that struggle with institutional stability (Calvo and Mishkin, 2003), reinforcing that without institutions committed to achieving price stability, the impact of dollarisation may not fulfil expectations.

The relationship between dollarisation and its impact on economic growth remains highly debatable in the literature. One would expect that with the stability dollarisation provides, it should attract investment, create employment, improve productivity and therefore, boost economic growth. However, some research argues that these growth effects are short-term and depend highly on complementary factors like fiscal discipline and institutional quality. (Bajrami, 2023), found that dollarisation was not strongly associated with faster or slower economic growth, essentially, a neutral effect on growth. Whereas, (Edwards and Magendzo, 2001) found that dollarised economies had a lower GDP per capita growth than non-dollarised economies, mainly due to their limited ability to adapt and accommodate external shocks like trade and capital shocks. (Koráb, Fidrmuc and Dibooglu, 2023) Supports this after their meta-analysis reported that dollarised economies experience a slower growth rate than non-dollarised and partially dollarised economies. Although it was indicated that the US currency provides better growth prospects compared to other currencies.

Turn Back Time?

With significant losses and criticisms following dollarisation, one begins to discuss whether this was a good decision and whether Ecuador and other dollarised economies could abandon

the US dollar and revert to their national currency. One of the criticisms is that developing economies cannot maximise their benefits from dollarisation due to significant differences in economic size and characteristics (Jameson, 2003). (Fischer, 2001) highlights the potential risks, including the provided exchange rate stability, which reduces the need to hedge. Analysing other economies, experience with different currency regimes, for instance, (De La Torre *et al.*, 2003) analysed Argentina's experience with a currency board and demonstrated that it was unsuccessful due to overvaluation of the peso, cheaper imports, worsening the trade deficit and inadequate financial discipline.

However, to de-dollarise, there are necessary conditions to return to a national currency. (Jameson 2003) outlines that this requires an independent central bank and confidence in the national currency. However, a criticism is that Ecuador experienced political instability, weak regulations and a loss of confidence in institutions and the original Sucre. Additionally, the reintroduction of the Sucre would involve high transition costs, re-transformation of pricing and risking loss in investor confidence, risking capital outflows (Jameson, 2003). Suggested alternatives to de-dollarisation include parallel currencies functioning alongside the US dollar, and slowly relieving to return to the Sucre. Consequently, this can create complexities in the market and public confusion as a legal tender. Another proposal was pegging a stable commodity like oil to the new currency; however, Ecuador heavily exports oil, which is reactive to shocks, increasing its dependence on oil and vulnerability to shocks and a volatile currency.

While there has been significant research conducted on dollarisation's effects on stability and growth, including research by (Edwards and Magendzo, 2006) and (Calvo and Mishkin, 2003). Nonetheless, there remain gaps and a lack of exploration in understanding how dollarised economies experienced external shocks, like the COVID-19 pandemic, compared to non-dollarised economies. Much of the research highlights the advantages and criticisms of dollarisation, such as stability, but there remains uncertainty on the impact on growth in dollarised economies.

Additionally, there is a limited exploration of whether Ecuador and other dollarised economies had a smoother experience during the pandemic compared to non-dollarised economies. Furthermore, there is a lack of comparative studies between Ecuador and El Salvador and non-dollarised economies, like Colombia, especially regarding the different management strategies for global events. (Villacreses and Bonilla-Bolaños, 2023) Found that the pandemic made

dollarised economies highly dependent on external borrowing to finance deficits and public health spending. However, less research has yet been conducted on which system managed shocks more effectively, a dollarised or a non-dollarised economy.

This dissertation aims to contribute to existing research by examining and reviewing the effects of dollarisation on macroeconomic factors such as growth and stability, simultaneously measuring its impact on reacting to the COVID-19 pandemic. It will also aim to conduct a comparative analysis of dollarised and non-dollarised economies' experiences during the pandemic, contributing new insights.

4. Methodology

4.1 Data and Sample Selection

The sample consists of panel data compiled from different macroeconomic measures of growth and stability to investigate the effects of dollarisation. The sample includes data for dollarised and non-dollarised Latin American economies over an extended period from 1990 to 2023.

The dollarised economies analysed are Ecuador and El Salvador, the principal references for economies that adopted the US dollar. These economies became dollarised in the same period, Ecuador in 2000 and El Salvador in 2001. Both economies resorted to this change to attain stability and stimulate economic growth. The non-dollarised economies selected are a selection across Latin America, including Colombia, Chile, Mexico and Peru. These countries were selected due to similarities in economic, geographical, and cultural background, including the history of colonialism.

The dataset is reported yearly due to increased availability and consistency, although quarterly data provides specific details, due to limited availability, yearly data was selected to facilitate the analysis.

Various macroeconomic variables were focused on to investigate the relationship between dollarisation and growth and stability, including GDP growth rate, foreign direct investment and inflation.

The main data sources for the analysis are various databases, including the World Bank, IMF data archive, CEPAL and some central banks. The data was selected based on the availability of the chosen variables and countries, for all years. Due to limited availability and various

missing data from Latin American countries in selected years, possibly due to alternative measures utilised compared to the majority, the collection is limited. Therefore, 7 countries were selected throughout the 34 years, resulting in a limited sample with 204 observations. Consequently, findings should be interpreted as suggestions regarding the effect of dollarisation.

4.2 Selected Variables

To analyse the effect of dollarisation on economic stability and growth, a combination of macroeconomic indicators was analysed, including GDP growth rate, inflation, foreign direct investment and current account balances as shown in Table 1 in the appendix. The relevant variables were retrieved in US dollars to ensure the independence of any exchange rates and ease the comparison between countries. Independent variables include the interaction term, which includes the treatment effect, and after the implementation and can include time-variant variables like external shocks. The control variable is central government debt (% of GDP), as a concern of developing countries is the debt that the government takes on. The level of government debt is a factor that can significantly affect the rate of an economy's GDP growth.

4.3 Econometric Model and Approach

One of the aims is to analyse whether economies that adopted the US dollar had more stable or projected growth and stability compared to neighbouring non-dollarised economies, and if the effects of dollarisation have been sustained in the long term. This study utilises a Difference-in-Differences regression model, allowing for comparative analysis between a treatment and control group to evaluate the impact of policies. The Difference-in-Differences model is a commonly used econometric model to illustrate the effect of implemented policies and to estimate the severity of the causal effects. The DiD model is appropriate for this investigation as it allows comparative analysis of pre- and post-policy implementation across economies and macroeconomic indicators, whilst isolating treatment effects and controlling for time-invariant variables.

To implement the Difference-in-Differences model, due to limited exploration and conducting the model, research and understanding were conducted to perform the model application in R and to ensure assumptions were fulfilled.

As Ecuador and El Salvador are two main economies that adopted the US dollar, these will be allocated to the treatment group. Despite there being more dollarised countries, these countries were relatively small, like Micronesia and had large differences in economic structure and characteristics, which did not prove appropriate to fulfil the parallel trends assumption and therefore, for comparative analysis, limited the treatment group. Therefore, the research and analysis were conducted focusing on Latin America, where two of the most important dollarised economies are based, allowing for comparative analysis with their neighbouring economies that have similarities in cultural, historical and economic characteristics.

The reasoning behind the selection of the control countries is that, for instance, Colombia has had a weak and volatile currency. As of 5th February 2025, the Colombian peso exchanges 1 USD to 4,156.88 Colombian pesos, reflecting the constant weakening of the Colombian Peso. Despite this volatility, Colombia has not adopted the US dollar, which has been an ongoing discussion. Peru, Chile and Mexico were selected due to also experiencing financial instability in the 1990s, however, Ecuador and El Salvador dollarised to recover, and these countries used alternative policies. All the countries also have significant trade relations with the United States. This paper aims to extend the model to previously under-researched economies to enhance the originality of the study by including countries like Mexico and Chile.

Treatment Group	***Control Group***
Ecuador	Colombia
El Salvador	Peru
	Chile
	Mexico

Table 2- Countries Analysed

The data collection involved retrieving data from before and after dollarisation, including the most recent data from 1990 to 2023. The pre-treatment period was classified from 1990 to 1999, and the post-treatment period was initially from 2000 to 2023. As El Salvador adopted the US dollar in 2001, and analysing 2002 statistics, Ecuador had significant experiences with stability from dollarisation, and El Salvador had smaller changes, the treatment period was moved to 2001 to capture the initial effects. This also helps to account for any lags, as

dollarisation may take some time to implement the US dollar and for the national currency to stop circulating. Including data until 2023, allows for new recent research and to visualise the experience of the pandemic of Latin American economies and their ongoing recovery, which has yet to be analysed deeply in recent literature. The pre-treatment data allows analysis of the pre-existing economic standing and the crisis Ecuador was experiencing, resulting in the decision to formally adopt the US dollar. The post-treatment period allows for the exploration of whether dollarisation provided further aid or burden during the economic crises and recovery period.

4.4 Model Assumptions

A key assumption of the DiD model is the parallel trends assumption, stating that before policy implementation, the selected countries or variables were experiencing similar trends to ensure that any significant change after implementation is not due to pre-existing trends or events. This can be performed visually or tested by applying the DiD regression model on the pre-treatment period only to decide whether there is any significance.

Another assumption is that there is no anticipation of the treatment as economies can change their behaviour before the policy implementation, for example, if Ecuador knew that dollarisation would occur, strategies may have been adjusted prior, and this can affect the DiD results as it does not show the true treatment effects. However, according to the IMF, dollarisation was a desperate decision from President Mahuad, therefore, Ecuador did not have the chance to change its strategies, and this can be seen in Figure 3 illustrating the high levels of inflation before the year 2000, we would have expected a gradual fall in trends before dollarisation but this was not so.

The treatment effect is also assumed to be homogeneous in the DiD model for the treated countries, as a result, similar economies were selected for comparison analysis. Consistency is also necessary for the DiD model to allow for consistent results. In this case, Zimbabwe was considered another dollarised economy, yet it often abandoned and returned to the US dollar, proving inadequate for the model.

4.5 Methodological Approaches in Literature

Existing empirical research that has previously used this application will be reviewed. For instance, (Miles, 2008) applied the DiD model to analyse the impact of adopting flexible

exchange rates in the Philippines, Mexico and Thailand, compared to a control group that maintained a fixed exchange rate regime. Whereas, (Díaz, 2023) applied the DiD model for comparative analysis of the United States, Ecuador and El Salvador to examine dollarisation effects on trade, whilst addressing concerns of endogeneity and heteroscedasticity. (Grijalva, Uribe-Terán and Gachet, 2024) adapted the model from a microeconomic perspective to investigate the effects of import tariffs on Ecuadorian firms across two years.

These studies utilise the model for causal analysis between treatment and control groups to compare before-and-after effects of policies. Contributing to the existing research, this paper aims to apply the DiD model to assess the long-term macroeconomic outcomes of dollarisation. While considering recommendations and new insights from existing research, by employing extended datasets.

4.6 Model Specification

The following model proves the econometric structure used in the Difference-in-differences regression analysis for every macroeconomic variable.

$$Y_{it} = \beta_0 + \beta_1 D_i + \beta_2 P_i + \beta_3 (D \cdot P)_i + \varepsilon_i$$

Where Y_{it} Is the outcome analysed variable for country i, Di is a binary treatment variable representing whether an economy is dollarised (1) or non-dollarised (0) and P is a binary treatment variable representing whether dollarisation was implemented (1 The coefficient. β_0 represents the intercept capturing the macroeconomic variables' value when the independent variable is equal to zero for the control group pre-treatment. The coefficient β_1, is the average difference between the control and treatment groups before the implementation of dollarisation. β_2 represents the average change for the control group over the analysed period. β_3 is the DiD estimator that measures the causal effects of dollarisation on the analysed variable, by comparatively analysing the difference between the treatment group and control group.). $D \cdot P_i$ Is the interaction term between the dollarisation treatment and after the implementation, which captures the Difference-in-differences effect. ε_i Is the error term.

The following hypotheses have been created to decide whether the findings answer the questions of this paper. H_0 states the null hypothesis and H_1, the alternative hypothesis.

1. H_0: Dollarisation did not have a significant impact on growth in the long run in dollarised economies compared to non-dollarised economies.

   H_1: Dollarisation did have a significant impact on growth in the long run in dollarised economies compared to non-dollarised economies.

2. H_0: Dollarisation did not provide stability in the long run and during economic shocks compared to non-dollarised economies, and the benefits were short-term.

   H_1: Dollarisation did provide stability in the long run and during economic shocks compared to non-dollarised economies, and the benefits were short-term.

4.7 Robustness Check and Variations

To ensure robustness in the model, tests and different methodological approaches were implemented in the model. Initially, a placebo test was performed to ensure robustness by running the DiD model assuming that dollarisation occurred before in the year 1995, which did not occur. Conducting this placebo test on the model helps to confirm the reliability of the model in measuring the effects of the treatment. If the model shows significant results with the false treatment period, then there could be a lack of robustness and possible bias in the results.

Another approach for robustness checks is implementing fixed effects that account for time-variant variables, like in this case, countries, to control and isolate for this. It helps to reduce any potential risks for bias by controlling for these fixed effects. This is achieved by using the function (feols) on R Studio,(*Program Evaluation - Robust and clustered standard errors with R*, no date).

5. Findings

5.1 Descriptive Statistics

Table 3 presents selected descriptive statistics for the variables selected in this paper's investigation. The table includes the overall descriptive statistics across the full-time period, divided by the treatment and control groups. The majority of the statistics, including standard errors and deviations, show a reasonable similarity despite that the treatment group consists solely of Ecuador and El Salvador, whereas the control group includes four. However, for

foreign direct investment, there is a greater significant difference between the treatment and control group, as foreign direct investment's value is taken in billions of USD, which may be due to the larger control group. Whereas the other variables are measured in percentages. Tables 7-10, included in the appendix, consist of the descriptive statistics for the treatment and control groups before and after dollarisation. Whilst most statistics had a reasonable similarity, post-dollarisation for a few variables, most importantly inflation, had greater differences, which is expected. This supports the parallel trends assumption and the comparability between groups, however, although there are some differences, this will be investigated more profoundly with the selected econometric model.

Table 3- Descriptive Statistics

	GDP Growth Rate	**Inflation**	**Unemployment**	**Current Account Balance**	**Central Government Debt**	**Foreign Direct Investment**
Median Treated	2.596	3.848	4.386	-1.850	45.292	-0.425
Median Control	3.559	4.414	7.800	-2.350	27.314	-5.352
Mean Treated	2.871	8.460	5.063	-1.907	43.436	-0.478
Mean Control	3.452	8.419	7.865	-2.377	28.499	-8.065
Standard Error Treated	0.396	1.330	0.194	0.371	1.559	0.046
Standard Error Control	0.321	1.040	0.288	0.229	1.123	0.709
Standard Deviation Treated	3.269	10.964	1.603	3.057	12.855	0.376
Standard Deviation Control	3.740	12.133	3.353	2.667	13.093	8.266
Skewness Treated	-0.898	1.784	0.866	0.255	-0.315	-0.552
Skewness Control	-0.824	4.966	0.813	0.142	0.501	-1.451

Sample Variance Treated	10.688	120.202	2.569	9.343	165.254	141183344.8
Sample Variance Control	13.991	147.201	11.244	7.114	171.422	68324987242.980

5.2 Assumptions Testing

This section will discuss the results of testing the assumptions that have to hold for the model to function correctly.

After initial exploratory data analysis, in Figure 2, it was noticed that Peru was experiencing high inflation in the early 1990s caused by a financial crisis, political turmoil and heightened crime activity. Consequently, it was best decided that the pre-treatment period was to be pushed forward in the data analysis from 1992 to 2002 to not violate the parallel trend assumption.

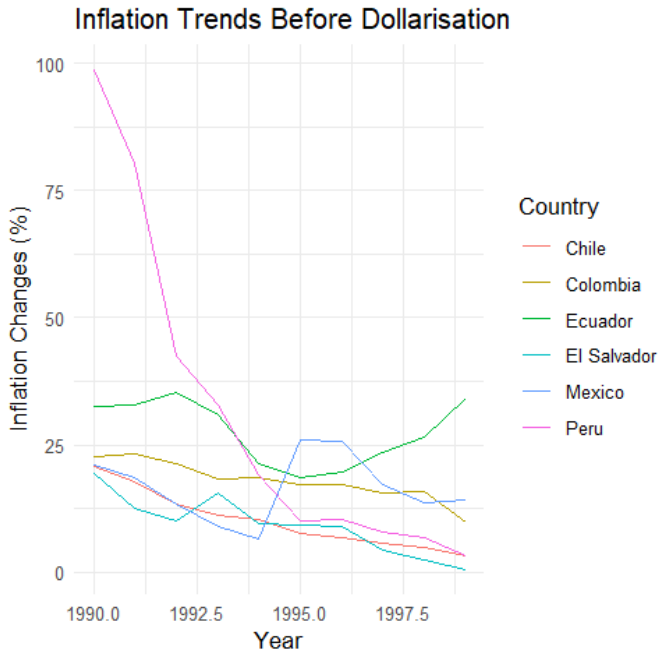

Figure 2- Inflation Trends 1990-2000

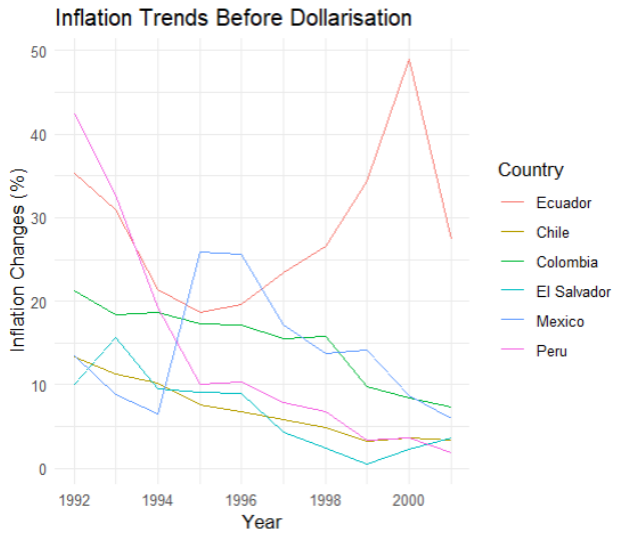

Figure 3- Adjusted Pre-Treatment Period

After adjusting the pre-treatment period as seen in Figure 3, the high inflation Ecuador and El Salvador were experiencing before dollarisation. It also reveals the stable decrease in Peru's hyperinflation and similar trends between the other selected economies. However, this still shows a potential violation of the parallel trends assumption as Ecuador and El Salvador adopted the US dollar in response to their experiences of hyperinflation and economic instability. This can lead to endogeneity as the treatment of dollarisation is a response to the high inflation trends before the treatment of dollarisation, potentially violating the parallel trends assumption (Caetano and Callaway, 2024)**.**

Running a DiD regression on the pre-treatment years helps to determine whether the parallel trends assumption was violated. If the results were significant, then this would indicate a clear violation of the assumptions, indicating that there were large variations between all countries. However, after running the model of all variables in the shortened pre-treatment period, all results returned insignificant results, indicating no violation of the parallel trends assumption.

As a result, the analysis of the effects of dollarisation on macroeconomic factors is suggestive, as causal analysis is limited due to the potential violation of differences in pre-treatment trends.

5.3 Main Findings

In this section, the findings of the Difference-in-differences model will be presented and discussed, thereafter, robustness findings from tests will also be discussed. As the sample size is small, this can produce small P-values, too, affecting the reliability of the findings therefore, it is appropriate to interpret the findings as suggestions.

Table 4- DiD Results

	DiD Interaction Term	*Standard Error*	*t-value*	*p-value*	*R2*
GDP Growth Rate	**2.291**	0.822	2.787	**0.04***	0.59
Inflation	**-12.935**	3.847	-3.362	**0.02***	0.498
Unemployment	**0.145**	0.648	0.224	**0.832**	0.758
Foreign Direct Investment	**4.968**	2.225	2.233	**0.076**	0.689
Current Account Balance	**1.438**	1.300	1.106	**0.319**	0.223

**suggests significance at the 5% level*

The Difference-in-differences effect of dollarisation is captured by the interaction term, which interacts with the treatment and the period after dollarisation combined. Table 4 presents the results of the Difference-in-differences model. The results will be used to decide what the interaction term tells us about what the results mean, and how dollarisation affects these macroeconomic variables.

Firstly, the GDP growth rate, the interaction term tells us that Ecuador and El Salvador experienced an increase of 2.291% percentage points in GDP growth after the implementation of dollarisation. The p-value is 0.04, suggesting it is statistically significant and that it is reasonable to suggest that dollarisation did have an impact on growth across dollarised economies. This rejects the first null hypothesis that dollarisation did not have an impact on growth in the long term. It suggests that dollarisation had a significant association with the growth of GDP. This is expected as economic growth can be affected by many factors, including technological advancements. Increase in education, and international relations with other countries, which dollarisation provided in its way.

A variable of interest to measure stability and how dollarisation provided these stability benefits is inflation, the DiD interaction term showed an estimated effect of decreasing inflation by 12.935 percentage points. The p-value of 0.02 is statistically significant, implying that dollarisation did affect inflation, rejecting the second null hypothesis that dollarisation did not provide stability over the long term. However, one of the concerns is the significantly small p-

value, and this could be due to the small sample size; therefore, we are to take these results with caution.

Another variable of interest is unemployment, the interaction term proves that a minimal increase in unemployment of 0.145 % percentage points in Ecuador and El Salvador was experienced, however, it's statistically insignificant, showing that dollarisation did not have a direct influence on unemployment. Further external factors need to be considered, as they may have influenced unemployment more significantly, like environmental disasters like Ecuador's El Niño impact on the agricultural sector, which could have affected unemployment more significantly.

After reviewing the results for the GDP growth rate and its minimal effect and insignificance, as previously discussed, dollarisation provided a stronger relationship between Ecuador and the US in international trade. Applying the model to foreign direct investment is an appropriate enhancement to the analysis, as the effect on the growth may have been reflected in investments into the economy from the US or other economies that found Ecuador and El Salvador to be more reliable due to the stability provided by the US. The interaction term for foreign direct investment proves that dollarisation did not have a significant effect on dollarised economies, although the P-value was insignificant, 0.07 is proximate to significance at the 5% level, perhaps with a larger sample size it can prove that FDI indeed influenced as the estimate would have suggested that dollarised economies had an increase difference of nearly $5 billion.

To reinforce the effect of dollarisation and association with the United States, another variable of interest is the current account balance, as it records the value of exports and imports of goods, investments and transfers. However, despite the increase in the current account balance compared to non-dollarised, the P-value is insignificant, suggesting no strong relationship, showing a weak relevance and statistical insignificance.

Overall, the regression results suggest that dollarisation had significant implications for stability and growth, and not as strongly for other macroeconomic variables like the unemployment rate and current account balance, which can also be subject to various factors affecting these variables.

5.4 Pandemic Experiences in the Latin American Economy

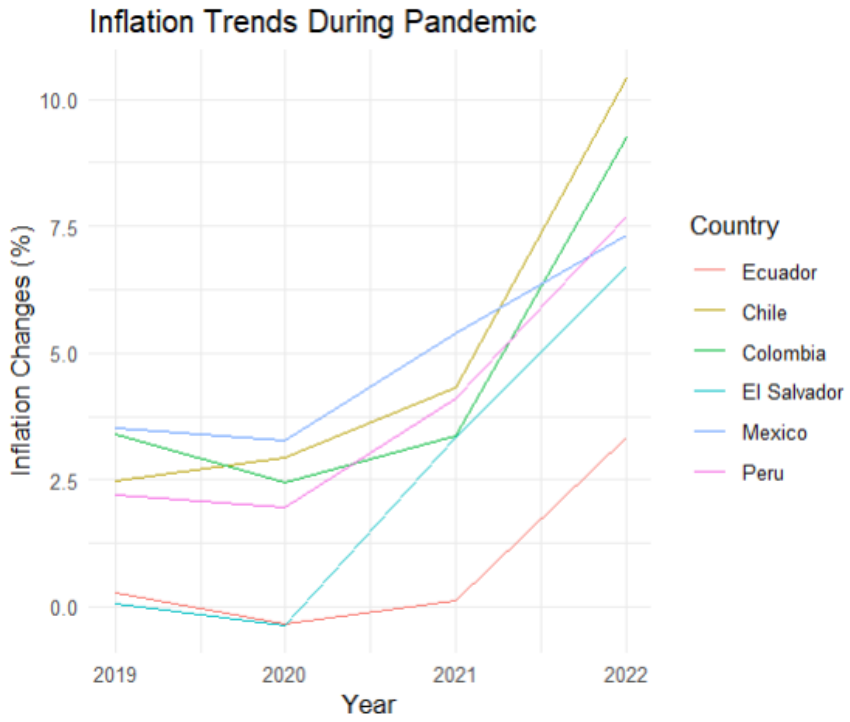

Figure 4- Inflation Trends During the Coronavirus Pandemic

One of the aims of this research is to analyse and compare Latin American dollarised and non-dollarised economies' experiences during global shocks like the COVID-19 pandemic. Figure 4 shows a visual presentation of how the analysed economies' inflation experiences were during this time. From 2019, we can at once see how Ecuador and El Salvador experience low inflation compared to their neighbouring economies. In 2020, the year of the pandemic, we can see a sharp increase in inflation for all economies., However, we can see that they are still experiencing high inflation. Despite this, we can visualise that Ecuador and El Salvador started with similar low inflation rates, but El Salvador had a sharp increase, unlike Ecuador, which had a lower inflation trend too, but increased at a smoother rate compared to the rest. Ecuador had the least inflationary pressures, which can indicate that there was better inflation control or was due to dollarisation providing stability.

Chile had the sharpest increase, reaching more than a 10% change in inflation by 2022, with Colombia and El Salvador with similar increases, but overall, Ecuador had the least inflation change.

After performing a Difference-in-differences model to analyse the effect of dollarisation on dollarised economies during the 2020 pandemic, as this has not been conducted, it is important to advise that the findings should be interpreted as suggestions due to the small sample size

and the limited period and data availability to continue the analysis of recoveries from the pandemic.

Table 5- Findings During the Pandemic

	DiD Interaction Term	Standard Error	t-value	p-value	R2
GDP Growth Rate	**0.519**	0.639	0.812	**0.453**	0.584
Inflation	**-9.913**	1.412	-7.020	**0.0009***	0.464
Unemployment	**0.054**	0.805	0.068	**0.95**	0.758
Foreign Direct Investment	**3.856**	2.332	1.654	**0.159**	0.678
Current Account Balance	**3.289**	1.249	2.634	**0.046***	0.241
Central Government Debt	**6.092**	5.044	1.208	**0.281**	0.492

Table 5 presents the findings of the DiD regression model during the pandemic period. The interaction term for inflation indicates that there is a significant effect with an estimate of reduced inflation of nearly 10 percentage points compared to non-dollarised economies, which is consistent with the visual diagram, with Ecuador having a smoother build-up of inflation compared to its neighbouring economies. Without fixed effects implemented, the significance effect was at 0.07, resulting in an insignificant whereas with fixed effects implemented to absorb time and country effects, the p-value falls dramatically to 0.0009. However, the small sample size could cause this, and it can be assumed that if the sample size were larger, the effect would remain significant with a more reasonable P-value.

Another significant value was surprisingly the current account balance, of an increase of 3.289% of GDP at a significant level of 0.046, indicating an increase in income inflows to dollarised economies.

Another measure was central government debt, as during the pandemic, due to loss and lack of monetary control, dollarised economies usually resort to fiscal measures or external borrowing, therefore, reflecting on the debt of the central government, including liabilities and is an indicator that helps to determine the debt of a country. However, although there was an estimated increase, the P-value was insignificant.

Overall, dollarisation's effect on stability proves to be sustained over time and during global shocks like the pandemic, however, this is not as significant for other variables like unemployment and GDP growth rate, which may be affected by alternative factors. In this case, the pandemic introduced a global exogenous shock, resulting in economic inactivity and lockdowns. As a result, it is expected that dollarisation did not have an impact on these measures during this period due to uncontrollable factors beyond the control of governments.

5.5 Robustness

The results from the DiD model accommodate for time-invariant variables that could affect the validity of the results. For example, although there was a great effort in selecting countries with similar economic characteristics, it is reasonable to accept that countries are not 100% identical and also experience different financial and national events affecting their economies. Using the package (feols) accounts for these differences between the characteristics of the countries and any events during the period, helping to control for any unobserved factors (*Program Evaluation - Robust and clustered standard errors with R*, no date).

Table 6- Placebo Test Results

Placebo Test in 1995	**Interaction Term Estimate**	**Standard Error**	**t-value**	**p-value**	**R2**
GDP Growth Rate	1.380	0.805	1.715	**0.147**	0.587
Inflation	-2.768	8.76	-0.316	**0.765**	0.453

Unemployment	-0.456	0.925	-0.493	**0.643**	0.758
Foreign Direct Investment	5.444	2.592	2.100	**0.09**	0.684
Current Account Balance	2.937	1.631	1.800	**0.132**	0.240

To ensure the robustness of the results of the DiD model, necessary tests were performed to ensure the results found were valid and reliable. The main approach involves implementing a placebo effect when the policy is implemented. The placebo test involves creating a fake period in which the policy is supposedly implemented. In this case, 1995 was randomly selected as a midpoint between the first data collected in 1990 and the year of Ecuador's dollarisation of 2000. After reviewing significant events during this period, in 1994, the North American Free Trade Agreement was signed between Mexico and the US, leading to expectations of significant trade and investment benefits for Mexico (Pacheco-López, 2005). The following year, Mexico faced a financial crisis with the constant devaluation of the peso known as the "Tequila Crisis". This supported the decision to select 1995 as the fake year for the placebo test, as this could have helped to answer any differences in the results with the original regression, indicating that some of the results could have been caused due to the financial crisis in Mexico. To ensure the results were valid and reliable, the results of the interaction term with this fake treatment year would have to be insignificant.

As seen in Table 6, for all variables, the p-values were insignificant, showing that portraying 1995 as when dollarisation took place was inconsistent. Therefore, when the regression model was applied with the true year of implementation and produced significant results, this shows that the results are reliable. If the robustness checks resulted in significant results of the regression with the false policy year, this would suggest that there were other events during that time that affected the results of dollarisation. This could have led to misleading results, as it would prove that the changes due to dollarisation were not in fact due to this but due to other events during that period. This assures us of the validity and reliability of the results from the regression with the correct year of dollarisation.

However, as for the R-squared values, they are relatively low, especially for GDP growth rate, current account balance and inflation. These results prove the lack of explanation for the variation in the variable, which is expected, as we expect that in 1995, no significant events occurred in these countries that could affect the interpretation and significance of the results with the original regression.

Overall, the results of the robustness analysis provide insight into the reliability of the findings, however, due to the small sample size, causing small p-values of significance, these findings should be best interpreted as suggestions.

6. Discussion of Findings

This section will now discuss the main results whilst comparing them to existing literature and theoretical foundations. This study found that dollarisation did not have a statistically significant impact on foreign investment, the current account balance or unemployment. While this study compares dollarised and non-dollarised economies, it is important to acknowledge that countries which chose not to dollarise. Many non-dollarised Latin American economies prefer monetary sovereignty due to stronger central banks and, greater need for exchange rate flexibility. These structural differences, including political concerns around the loss of monetary independence, likely discourage dollarisation.

The interaction term for GDP growth indicated that dollarisation had a significant positive impact. However, this is inconsistent with (Edwards and Magendzo, 2003), who observed that dollarised economies tend to experience lower growth rates than non-dollarised economies. In their study, using local linear regressions, the estimated difference in GDP growth was approximately 2.29 percentage points lower compared to non-dollarised economies. This is likely due to difficulties in accommodating external shocks in trade and capital flows, especially in the absence of monetary policy controls. These findings highlight the importance of fiscal discipline and organised governance to manage shocks effectively. (Koráb, Fidrmuc and Dibooglu, 2023) highlighted that this governmental discipline can enhance the long-term growth opportunities under dollarisation. Most importantly, these findings reinforce the significant sacrifice of independent control of monetary policy in exchange for stability, also reducing flexibility to respond to shocks. Also, it increases the reliance on and, therefore, relies more on fiscal policy and external borrowing. There is also increased importance on the requisites of organised institutions to maximise the use of financial and economic resources to respond effectively to shocks.

Concerning dollarisation effects on inflation, an expectation was that inflation reduced compared to non-dollarised economies, and this was fulfilled and statistically significant, suggesting that dollarisation did provide stability in dollarised economies compared to non-dollarised economies. This finding is consistent with that of (Edwards and Magendzo, 2003), who found that inflation had significantly reduced in fully dollarised economies compared to non-dollarised economies, with median differences ranging from -3.4% to 5.7% annually. This was expected due to the underlying effect of dollarisation being stability, and after dollarisation was implemented, inflation in Ecuador was reduced significantly. These findings reinforce the theoretical benefits of dollarisation, that by removing the control of printing more money and quantitative easing, the economy relies on the US monetary decisions, which are more organised to stabilise economies, therefore, benefiting Ecuador and El Salvador.

The interaction term for dollarisation affecting unemployment was insignificant, indicating that dollarisation did not have an impact on the unemployment rate compared to non-dollarised economies. There has been limited research performed on the impact of unemployment, however,(Soto, 2009) found that Ecuador's labour market after dollarisation became "sluggish". Findings indicated that a 1% increase in GDP resulted in expansionary employment by approximately 2.3 percentage points. Therefore, as Ecuador's GDP grew 39% 5 years post-dollarisation, according to the findings, the expectation would be that employment would also increase by 91% however, it only increased by 32%. This was due to a positive effect of increased economic growth, resulting in higher labour demand, however, a negative substitution effect offset this, as labour became more expensive relative to other factors of production. Consequently, firms decided to employ machinery or imported materials, as this had a lower cost compared to employing new workers. He also suggested that the evolution of the labour market would be shaped by economic growth and how the government sets minimum wages.

This helps to explain why there was an increase in GDP growth but a decrease in unemployment across a longer period, and that there was no strong significance, as the reduction of the unemployment rate also depends on how the government manages economic growth and designs employment policies by determining minimum wages, hiring costs to incentives firms to employ new workers. Therefore, it could be assumed that economic growth and government employment policies are important to complement the benefits of dollarisation, as it helped increase economic growth, which in turn helped to create more

employment, but also, due to the increase in trade, new machinery became more cost-effective than employing workers.

Considering these findings, running the model again for unemployment controlling for controlling for foreign direct investment, provided an insignificant value, inferring no strong relationship. As there is limited research on the effects of unemployment, this still provides inconsistent inferences on whether dollarisation helped job creation.

As other factor inputs became more cost-effective compared to labour, this could be due to an increase in foreign direct investment. However, the findings presented an insignificant estimate of approximately $5 billion in foreign direct investment, suggesting that dollarisation did not have a significant impact. This is inconsistent with the theory that foreign direct investment and dollarisation increase investors' attractiveness due to the stability of the US dollar (Quispe-Agnoli, 2002). It would also be expected that Ecuador experiences an increase in trade, as there exists a complementary relationship between trade and foreign direct investment.

Foreign direct investment and trade can improve innovation and technological advances, which can help boost productivity and economic growth while importing and exporting goods. It would be expected to see an increase in foreign direct investment and also an increase in trade, however, (Díaz, 2024) findings contradict this, as it was found that dollarisation did not produce significant positive trade effects for Ecuador or El Salvador. It was discussed that, as Ecuador and El Salvador had an existing trade relationship with the United States, there was no significant transformation in the trade patterns, and it was recommended to consider complementing dollarisation with further trade reforms to obtain higher trade integration. The findings can align with this, as they resulted in an insignificant effect on FDI, suggesting that alternative factors are necessary to affect this. However, this is contradicted by (Bajrami, 2023), who found that dollarised economies had higher trade and investment growth compared to non-dollarised economies with a range of exchange rate regimes, after examining the impact across several economies.

Another important variable to measure growth is the current account balance, which measures the total value of important sales and exports as well as any secondary income, however, although the findings were insignificant, the estimate was an increase of 1.806 percentage points of GDP. This highlights that although there was no significant increase, the current account balance increased, which is to be expected with increased foreign direct investment, boosting productivity and capital to enhance effectiveness, therefore increasing exports and

with improved economic integration, there was a boost in imported machinery. However, with insignificant results for foreign investment, this is not consistent.

In summary, there were a few significant results of dollarisation's impact on stability and growth, in this case, inflation, which was expected, and growth with foreign direct investment, which one would expect due to increased economic integration with the United States and with stability, attract investors. However, it is important to note that these findings of the Difference-indifference are to be interpreted as suggestions due to the small sample size, and further research, including more countries, should be conducted to establish strong, significant results.

6.1 Discussion on Pandemic Findings

Regarding Ecuador and El Salvador's experiences during the COVID-19 pandemic compared to non-dollarised economies, a main finding was that dollarised economies, specifically Ecuador, had lower inflationary pressures than the rest, at a significance level of 0.0009.

Another aspect was that the current account balance increased by 3.3 percentage points at a 5% significance level, indicating that dollarisation helped to sustain a positive current account balance during the pandemic, whereas, per our main findings, there was no significance in the relationship between current account balance and dollarisation.

For the pandemic, an important variable was the central government debt. (King, Samaniego and Carranza, 2021) discuss the constraints that Ecuador had due to the limitations of Ecuador's ability to use monetary policy, such as quantitative easing and devaluation of the currency. Due to the loss of these tools, the government struggled to fund emergency spending during the pandemic for the public's health, such as vaccinations and funding for the health system, which was already in a poor state. Accordingly, it was expected to see an effect on government debt, however, the findings are not consistent with this, as they provided insignificant results, inferring that dollarisation did not have an impact during the pandemic.

During the global pandemic, liquidity risks were another challenge for Ecuador due to the central bank's limited capacity to provide support and to act as a lender of last resort. Nonetheless, the central bank maintained stability with a bank capital ratio of around 15% by the end of 2022 (IMF Department, 2023). Ecuador's financial sector includes a significant government presence with ownership of six institutions controlling 36% of assets in 2023, making it one of the largest government-owned financial sectors on the continent. Collectively,

the banks held combined assets of 78% of GDP, stressing the importance of a regulated banking system, like lending rate caps, to reduce risk diversification.

(Camino-Mogro, 2021) Analysed the impact of lockdown policies using a regression discontinuity in time and found that total deposits reduced by 3.4% and government deposits by 8.69% after the implementation of obligatory lockdowns, as well as a large increase in the risk of liquidity. However, he highlighted that dollarisation provided stability by reducing the risk of increased economic shocks.

The COVID-19 pandemic impacted Ecuador's GDP by contracting by 7.75%, worsening its fiscal deficit. The decrease in inactivity due to demand destruction**,**(*How the COVID-19 Pandemic Plunged Global Oil Prices*, 2020)impacted oil prices, which could explain why it did not have a positive impact on GDP growth. Consequently, Ecuador highly depended on external financial support, increasing its debt. Additionally, it worsened structural problems affecting unemployment, inequality, and poverty.

Overall, dollarisation appears to have provided price stability in terms of inflation rates during the pandemic. The pandemic occurred very recently, and economies are still recovering, therefore, solid conclusions cannot be drawn about dollarisation's role in the recovery. With the COVID-19 pandemic being a significant global shock, the economic inactivity due to lockdowns and additional factors, it was expected that there would not be significant effects for most variables due to the abrupt halt and economic stillness.

7. Limitations and Reflections

This section will discuss the limitations of this paper. Firstly, a limitation was the sample size, due to limited data availability for certain countries and measures, the sample size was constrained. Developing economies in Latin America often have inconsistent data due to incomplete reporting and submission, therefore, affecting the sample size. Similarly, the current control group also had some missing data, which was resolved by merging and cross-validating with various sources, central banks and reports, as well as performing some interpolation. Despite these extra measures, there remains some concern over the reliability of some figures, especially in some economies where validity may be affected due to governance and political

weaknesses. Additionally, due to the limited number of observations analysed, there is a higher chance that it is harder to reject the hypothesis.

Secondly, initially, there were concerns over heterogeneity and endogeneity, which were resolved by creating an interaction term to help isolate the treatment effect. Without the interaction term, the model was generalising dollarisation effects across all countries. Whereas, the interaction term helped to separately isolate the effect from the treatment group and control group, enabling comparative analysis. The interaction term also helped to resolve collinearity issues, as El Salvador was being dropped from the model, however, the interaction term resolved this by specifying the countries that were being analysed compared to the control group.

Thirdly, another concern was possible selection bias, due to the limited number of countries analysed and what this means for the results. However, there are no further steps that can be taken, as there have not been more dollarised economies in Latin America. Although there are more dollarised countries, some are partially dollarised or their exchange rate is pegged to the US dollar, but do not operate the same way as Ecuador and El Salvador, which profoundly use the US dollar for all legal tenders. Additionally, due to the limited number of countries analysed, countries were excluded from the model to prevent violating the parallel trends assumption, which may indicate that the results are suggestive and not as conclusive.

8. Conclusion

In conclusion, this study aims to investigate whether dollarisation has a long-term impact on economic growth compared to non-dollarised economies. Another objective is whether dollarisation sustained stability over time since its implementation, compared to non-dollarised economies. To achieve these aims, a Difference-in-Differences model was applied to 6 similar Latin American economies from 1992 to 2023.

The findings suggest a moderately significant positive effect on GDP growth rates and inflation, whilst the impact on unemployment, foreign direct investment and other variables was insignificant. These findings are consistent with existing literature that dollarisation provides stability, however, per the literature, there remains an undetermined effect on GDP growth, whilst some findings found it to be neutral.

However, it also suggested that there was no or minimal effect on unemployment rates. Existing literature indicated that there was a negative substitution effect with capital inflow affecting

the unemployment rate. After controlling for foreign direct investment, the effect remained insignificant, indicating additional external factors affecting this. Although dollarisation provides growth benefits, it is not a sufficient approach on its own to provide trade improvements and job creation.

Regarding the pandemic, dollarised economies experienced lower inflationary pressures, principally Ecuador, compared to El Salvador and non-dollarised economies. This provides suggested evidence that dollarisation helps to sustain the stability benefits in the long run, highlighting that dollarisation not only provides immediate benefits but also sustains over an extended period, in this case, nearly 25 years and global shocks.

The limitations and findings of this study can provide possibilities and lessons for further research. This research can be expanded to include more countries in the control group if there is improved data availability to provide more robust and concrete evidence. While this study can offer a foundation for future research employing a larger sample size, however, this may vary based on country selection and variables.

Further research could consider an experiment from a behavioural economics perspective. A discussion was that Ecuador, along with other Latin American developing economies, struggle with their fiscal responsibility and lack of institutional organisation, leading to poor management of economic shocks. By including survey data and/or institutional variables that could have affected the significance of the benefits of dollarisation in these Latin American economies. This could be via variables considering government stability, corruption, trust levels in the government and the results of presidential elections, to decide and analyse how dollarisation affected consumers, firms, investors, and overall society.

This study contributes to the current literature on dollarisation's long-term effects, indicating that whilst stability and growth sustain over time, other factors like unemployment remain undetermined, suggesting the need for the government to intervene and encourage the market as well as improve institutional structure and discipline.

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10. Appendix

Table 1- Description of Variables

Variable Codes	Variable	Description	Sources
dollarised	Coefficient 0 and 1	Describes the dollarised economies (1) to separate from the non-dollarised (0)	**n/a**
afdollar	Coefficient 0 and 1	Represents after dollarisation (1) and before dollarisation (0)	**n/a**
Treated_country: afdollar	Interaction Term	The DiD estimator and the main effect for dollarised and non-dollarised economies	**n/a**
gdp_gwr	GDP Growth Rate	An annual growth rate of Gross Domestic Product at market prices measured in percentage	**World Bank Group**
inf	Inflation Rate	A measurement of the consumer price index is the annual change in the costs of an average basket of goods and services consumed.	**World Bank Group**
unemp	Unemployment rate	The percentage of the national labour force that is available and actively seeking work but without any.	**International Monetary Fund**
cab_gdp	Current Account Balance as a % of Gross Domestic Product	The sum of net exports of goods and services and net and secondary income.	**International Monetary Fund (IMF)**
fdi	Foreign Direct Investment in Billions of USD	The direct investment flowing into the receiving economy is associated with an investor having control or a significant level of influence over the management of the investment.	**World Bank Group Central Bank of El Salvador**
ggd_gdp	Central Government Debt as a % of Gross Domestic Product	Total debt stock issued by the central government as a percentage of GDP.	**International Monetary Fund (IMF)** **CEPALSTAT** **Central Bank of Ecuador**

Descriptive Statistics

Table 7- Dollarised Pre-Treatment

	GDP Growth Rate	Inflation	Unemployment	Current Account Balance	Central Government Debt	Foreign Direct Investment
Minimum	-4.739	0.512	4.291	-8.000	26.169	-1.103
Median	2.652	18.656	6.960	-1.900	46.900	-0.162
Mean	2.766	18.399	6.120	-1.965	45.793	-0.287
Standard Error	0.489	2.728	0.367	0.636	2.718	0.067
Standard Deviation	2.346	13.083	1.760	3.052	13.033	0.321
Skewness	-1.193	0.510	0.298	1.001	0.201	-1.099
Max	7.022	49.005	9.940	6.300	72.100	0.023
Sample Variance	5.504	171.173	3.096	9.316	169.852	0.103
Count	23	23	23	23	23	23

Table 8- Control Group Pre-Treatment

	GDP Growth Rate	Inflation	Unemployment	Current Account Balance	Central Government Debt	Foreign Direct Investment
Minimum	-5.910	3.229	2.200	-9.000	8.796	-18.382
Median	4.231	13.983	7.800	-3.600	22.300	-2.083
Mean	3.948	17.785	7.847	-3.339	28.523	-3.671
Standard Error	0.552	2.702	0.595	0.429	2.494	0.651
Standard Deviation	3.664	17.920	3.946	2.848	16.544	4.318
Skewness	-0.585	3.251	1.319	0.241	0.948	-1.820
Max	12.308	98.681	20.520	4.000	66.900	0.079
Sample Variance	13.428	321.128	15.574	8.114	273.707	18.646
Count	44	44	44	44	44	44

Table 9- Dollarised Post-Treatment

	GDP Growth Rate	Inflation	Unemployment	Current Account Balance	Central Government Debt	Foreign Direct Investment
Minimum	-9.245	-0.737	2.758	-8.500	14.900	-1.455
Median	2.425	2.660	4.275	-1.850	43.941	-0.495
Mean	2.807	4.311	4.630	-1.907	42.286	-0.549
Standard Error	0.518	1.133	0.184	0.371	1.858	0.054
Standard Deviation	3.587	7.850	1.276	3.057	12.875	0.372
Skewness	-0.767	4.629	0.781	0.255	-0.485	-0.466
Max	11.905	49.005	7.330	6.300	63.700	0.226
Sample Variance	12.867	61.616	1.629	9.343	165.773	0.138
Count	48	48	48	48	48	48

Table 10- Control Group Post-Treatment

	GDP Growth Rate	Inflation	Unemployment	Current Account Balance	Central Government Debt	Foreign Direct Investment
Minimum	-10.933	0.193	2.200	-8.700	3.900	-35.612
Median	3.268	3.521	7.900	-1.950	28.300	-6.522
Mean	3.244	4.030	7.965	-1.897	28.380	-9.974
Standard Error	0.378	0.209	0.338	0.248	1.146	0.905
Standard Deviation	3.702	2.052	3.313	2.432	11.224	8.867
Skewness	-0.974	1.064	0.687	0.293	-0.177	-1.141
Max	13.355	10.503	20.520	5.500	52.377	1.217
Sample Variance	13.706	4.209	10.978	5.915	125.974	0.786
Count	96	96	96	96	96	96