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THE IMPACT OF DOLLARISATION ON ECONOMIC GROWTH, INVESTMENT, AND TRADE

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IES Working Paper 27/2023

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The Impact of Dollarisation on Economic Growth, Investment, and Trade

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Abstract:
Dollarisation has been extensively debated and is often promoted as a viable monetary and exchange rate policy alternative for emerging economies. While most arguments for and against dollarisation are grounded in theory, there is a recognized scarcity of empirical evidence on the topic. This study evaluates over two decades of dollarisation experience in emerging economies. Our results suggest that dollarisation is associated with similar economic growth levels as other exchange rate regimes. However, it comes with the cost of more negative current account balance growth rates and heightened growth volatility, especially in the past decade. Nevertheless, dollarised countries benefit from higher levels of investment and trade. Contrary to a significant part of the existing literature, our findings challenge the perceived benefits of dollarisation in terms of economic growth. Additionally, we demonstrate that dollarised countries differ in various macroeconomic indicators when compared to individual exchange rate regimes, even against other fixed exchange rate regimes — which are often assumed to be homogenous.

JEL: E42, E52, F31, F45
Keywords: dollarisation, GDP growth, growth volatility, trade, investment, exchange rate, empirical evaluation

1 Introduction

The dollarisation debate has become increasingly cumbersome. A clear dichotomy has emerged between theory and empirical findings. This gap stems from the absence of comprehensive studies that test theoretical aspects, limited dollarisation experiences, or challenges in isolating and testing hypotheses derived from theoretical costs and benefits of dollarisation. In light of this, this study contributes to the existing literature by providing an empirical evaluation of dollarisation. Our objective is to assess the impact of dollarisation, viewed as an exchange rate arrangement, on the real economy. Specifically, we examine how dollarised countries have performed in terms of annual rates of real GDP growth, growth volatility, real investment growth, real trade growth - including real growth rates on import and export - and current account balance growth, relative to their non-dollarised counterparts. Contrary to much of the prevailing literature, this study does not focus on a single or a few dollarised countries but captures the experience of all small dollarised economies[1].

As a monetary policy alternative, dollarisation emerges from the concept of Optimum Currency Areas, pioneered by Mundell (1961). Countries exhibiting a high degree of economic integration might benefit from monetary integration by adopting common currencies, potentially unlocking higher economic growth levels. Throughout the 1990s, dollarisation became a subject of debate and interest, with several countries contemplating and ultimately adopting it as a monetary policy alternative. This trend was triggered by the need to embrace the principle of the so-called impossible trinity. This principle suggests that countries must sacrifice one of the following three: monetary independence, exchange rate stability and capital integration (Frankel 1999, Hausmann 1999). Faced with this dilemma, dollarisation, at least in theory, is advocated as a feasible policy that delivers superior outcomes compared to middle-ground exchange rate solutions[2]. Moreover, the theory suggests that dollarisation might yield more favourable results than floating exchange rate regimes, due to the ability to shield economies, especially smaller ones, from speculative attacks (Swiston 2011).

[1] This study excludes microstates, countries with a very small number of populations, isolated islands, etc. which are described as atypical examples in the literature and thus present risks of biased results.
[2] Exchange rate arraignments that involve soft pegs or residual, which do not fall under fixed or floating exchange rate arraignments are referred to as middle-ground solutions.

The timing of this research has enabled us to offer a more extended analysis of the dollarisation experience compared to most available studies on the topic. While many studies of dollarisation are from the early 2000s and rely heavily on theoretical discussion, this paper evaluates the economic performance of dollarised economies from the year 2000 until 2021. By examining both aggregate and specific periods, this study aims to provide comprehensive, unbiased results that account for offsetting potential short-term economic fluctuations. As Edwards & Magendzo (2003) emphasize, with the passage of time and the accumulation of more data on dollarisation experiences, our understanding of the performance of this monetary regime deepens. There is a consensus in the literature about the need for further empirical evidence (Yeyati & Sturzenegger 2003, Edwards 2001, Nuti 2002). To test the hypotheses, this study employs both panel and time series data, utilising secondary data sources from the World Bank and the International Monetary Fund databases.

Our findings suggest that dollarisation is not associated with distinct economic growth rates in comparison to other arrangements. However, beyond real output growth, dollarised countries have shown different outcomes in several indicators. Specifically, dollarised countries have experienced higher growth rates in investment, trade, and growth volatility (valid only for the last ten years) compared to non-dollarised counterparts. The impact of dollarisation on investment and trade is especially pronounced, the latter supporting findings from a widely debated part of the literature (i.e., Rose 2000). Dollarised countries exhibit higher real growth rates in both import and export compared to their non-dollarised counterparts. This is particularly robust when comparing dollarisation against other middle ground and floating exchange rate regimes, individually, confirming the theory. Direct comparisons between dollarisation and five other exchange rate arrangements also reveal significant differences in other indicators.

This paper is organized as follows. A background chapter introduces the main concepts of dollarisation and other forms of exchange rate regimes, as well as the rationale for their adoption. The third chapter focuses on the literature review chapter, with a presentation of theoretical and empirical findings on the benefits and costs of dollarisation. The fourth chapter explains the methodology used in this paper, followed by the presentation of research findings in the fifth

chapter. A conclusion chapter with policy implications and research limitations concludes this paper.

2 Background

Dollarisation entails the official abandonment of the national currency and the adoption of a foreign currency - commonly the U.S. dollar or the Euro - as a replacement for the national currency. Dollarisation is, after all, a form of fixed exchange rate regime, though a rather extreme one. The debate on dollarisation is a debate on exchange rate regimes. It is widely argued that extreme solutions to exchange rate regimes provide a superior alternative to intermediate ones (Frankel 1999, Fischer 2001, Palley 2003, Starr 2006, Wójcik & Backé 2004). Fischer (2001) argues that as long as countries engage in international capital markets, soft peg arrangements represent an unstable solution due to their susceptibility to financial crises. Swiston (2011) explains how the instability of intermediate exchange rate regimes during the 1990s pushed countries to move towards either freely floating or fixed exchange rates. Intermediate exchange rate alternatives such as adjustable pegs or managed floats have proven much too susceptible to speculative attacks and macroeconomic instability.

Arguing against a non-intermediate exchange rate solution, as well as advocating for an extreme one, often oversimplifies the subject. As Frankel (1999) argues, countries can choose from nine different exchange rate modalities, and no single modality is universally suitable for all countries, or even for a single country at all times. On one end, rigid forms such as currency union, dollarisation or fixed exchange rates come with their own set of benefits and costs, just as a free float does on the opposite end. Proponents of extreme alternatives argue that these exchange rate arrangements offer better protection against speculative attacks. Smaller countries, and consequently their currencies, tend to be more susceptible to these attacks. Alexander & von Furstenberg (2000) suggest that the currencies of smaller countries, especially those under intermediate exchange rate regimes, often lack credibility issues, making them more vulnerable to the contagion of financial and speculative crises. This perspective has gained attention among

economists and policymakers in recent decades, leading many countries to lean towards extreme floating or fixed exchange rate regimes[3].

Fixed exchange rates offer fundamentally different implications compared to floating ones. Under fixed exchange rates, especially extremes like dollarisation, countries can achieve a reduction in exchange rate risk and transaction costs\, but this comes at the expense of relinquishing their monetary policy. Thus, any adjustment mechanism of the monetary policy options ceases to exist for countries adopting this regime. Conversely, countries with floating rate regimes retain their monetary policy tools but must contend with exchange rate risks. Critics, however, assert that even countries with fixed exchange rates eventually intervene in the market, as their currencies can become vulnerable to financial fragility (Hausmann 1999, Palley 2003). Moreover, fixed exchange rates, including dollarisation or currency boards, tend to be less susceptible to speculative attacks and financial crisis contagion. They could offer superior outcomes compared to floating rates, especially for small and emerging economies that struggle to conduct stable monetary policy (Berg & Borensztein 2000). Therefore, for countries with weak currencies and a lack of institutional discipline, dollarisation might be a viable exchange rate alternative that safeguards countries from currency crises.

Dollarisation is defined as an exchange rate arrangement in which a country unilaterally adopts the legal tender of another country. By doing so, a dollarised country effectively relinquishes its entire monetary policy and its associated tools (IMF, 2014). It is critical to distinguish between "dollarisation", where a national currency is officially replaced with a foreign one, and "financial dollarisation", which refers to the concurrent use of one or more foreign currencies alongside the national currency. While a high degree of financial dollarisation might resemble full dollarisation – given that limited use of the domestic currency diminishes the effectiveness of monetary policy tools – the two are distinct. This study focuses solely on the impact of full dollarisation.

3 Literature Review

3.1 Optimum Currency Area

[3] Including exchange rate arrangements such as currency board arrangements or full dollarisation.

Mundell (1961) pioneered the concept of monetary integration. In his work, he explains how the economic integration of regions creates conditions conducive to monetary integration. Since flexible exchange rate regimes pose significant threats (such as speculative, exchange rate, and institutional discipline risk) to economic viability, monetary integration in economically integrated regions could foster economic growth. These integrated regions, defined as Optimum Currency Areas (OCA), are characterized by high mobility of factors and intense trade between countries. The OCA theory paved the way for both the monetary integration of the euro area and the dollarisation of countries. Mundell (1961) argues economic integration should ideally adopt common currencies, while a regional currency can operate with a flexible exchange rate. This could unlock greater potential for harvesting the benefits of economic integration.

Extending the OCA theory analysis, Alesina & Barro (2001) claim that adopting dollarisation is justified for countries that have experienced high and unstable inflation, as well as exhibit either high trade volumes or significant integration, have synchronised business cycles, and maintain price stability with the anchor country. Moreover, a particular country considering dollarisation should be small in economic scale, have widespread use of anchor currency, feature flexible labour markets, and exhibit a history of credibility problems along with monetary policy mismanagement (Sachs & Larrain 1999, Horváth 2004). At least theoretically, under these conditions, dollarisation might prove to be a superior policy tool compared to other exchange rate arrangements, thereby unlocking several benefits for dollarised countries. On the other hand, theoretical literature implies that failing to meet OCA criteria, while being either dollarised or sharing a common currency, might experience increased output volatility.

3.2 Theoretical Costs and Benefits of Dollarisation

The dollarisation debate is often detached from empirical evidence. The current theory focuses heavily on identifying potential benefits and costs of dollarisation and weighting these to determine the net outcome. However, all theoretical benefits of dollarisation should be approached with caution until they are empirically verified (Chang and Velasco 2002, Edwards 2001). Many argue that there is a lack of empirical evidence concerning dollarisation experiences. Therefore, an

empirical investigation of dollarisation is crucial, especially to determine the validity of theoretical assertions (Yeyati & Sturzenegger 2003, Bogetic 2000, Nuti 2002).

The debate on dollarisation is largely driven by theory. It is grounded in the notion that dollarised countries stand to benefit from enhanced monetary and economic stability, greater credibility, and reduced uncertainty, thanks to the maturity and sound policies of institutions such as the Federal Reserve or the European Central Bank (Calvo 2002). The subsequent section outlines the primary theoretical benefits and costs of dollarisation.

3.3 Theoretical Benefits of Dollarisation

At least in theory, a dollarised country stands to unlock multiple economic benefits. The adoption of a foreign currency introduces a new economic environment, one where risks related to the exchange rate, transaction costs and devaluation are mitigated by the dollarised currency. Many authors suggest that such changes could yield benefits in terms of trade, interest rates, investments, reduced inflation, decreased vulnerability to financial and balance of payments crises, deeper economic integration, enhanced fiscal discipline, and even higher economic growth. These potential benefits make dollarisation such an attractive proposition for many countries. However, much of this theory remains empirically unverified.

A primary theoretical benefit of dollarisation is an anticipated increase in the level of trade. Currency-related hindrances like currency exchange risk, transaction costs, currency mismatch, and devaluation risk are eliminated by adopting a foreign currency as a legal tender. This is not only valid between the dollarised and currency-issuing countries but also more broadly, based on the credibility of dollarised currencies (e.g., U.S. Dollar or EURO). The removal of these barriers should theoretically boost the trade volume of dollarised economies (Berg & Borensztein 2000, Bogetic 2000, Imam 2000).

The exact impact of currency risk factors impact remains largely unknown. While some studies, like Rose (2000), indicate a strong influence of dollarisation on trade, others, such as Levasseur (2004), question the magnitude of this effect. Havránek (2010) in his meta-analysis study highlights publication bias regarding currency unions and trade, suggesting that the trade effect may be less pronounced than previously believed. Winkler *et al.* (2004) argue that

dollarisation does not necessarily lead to higher levels of trade and integration with the anchor currency country.

Calvo (2000) suggests that eliminating devaluation and currency exchange risks could manifest as enhanced macroeconomic stability, leading to lower, less volatile interest rates. Consequently, a dollarised country might benefit from increased investment and financial stability. The promise of these benefits could attract international investors, fostering an improved investment environment, easier access to global capital markets, and, potentially, elevated economic growth (Berg & Borensztein 2000, Hanke & Schuler 1999, Kotios 2001). Yet, much of this remains theoretical. Alexander & von Furstenberg (2000) highlight the significant costs of dollarisation, particularly the lost seigniorage. They suggest that countries benefiting from improved investment climates and prolonged economic stability may eventually consider the costs of dollarisation as too high.

Other theoretical benefits of dollarisation include lower and more stable inflation levels. The price stability effect is well understood and backed by empirical evidence. The premise is that dollarised countries indirectly adopt the sound policy frameworks of established institutions like the Federal Reserve or the European Central Bank (Edwards 2001, Goldfajn & Olivares 2001).

Additionally, dollarisation might indirectly improve financial stability. With the removal of the lender of the last resort function, moral hazard will be eliminated, banks might be driven to adopt greater transparency and more stringent supervision measures, bolstering overall stability (Hausmann, 1999). Consequently, dollarised economies are less susceptible to financial crises' contagion and balance of payments crises. Eichengreen (2002) claims that fiscal consolidation might also be a benefit of dollarisation. Without the option of addressing deficits through monetary expansion, governments could adhere to more fiscal prudence. However, a detailed exploration of the impact on the financial sector and fiscal stability is beyond this study's scope.

3.4 Theoretical Costs of Dollarisation

Dollarisation bears both economic and political costs. Among the most significant economic costs are the loss of seigniorage, the absence of a lender-of-last-resort option, and other monetary policy functions, such as countercyclical market interventions.

Seigniorage costs comprise the necessary amounts of foreign currency needed to replace the domestic currency in circulation (referred to as the stock costs) and the potential future earnings that could be realised if the country continued to issue its currency (known as the flow costs) (Levasseur 2004, Imam 2000). Nuti (2002) estimates that seigniorage costs are estimated at around 1-2% of GDP.

Adopting a foreign currency means that many central bank functions are lost, with one of the most significant being the lender-of-last-resort function. Rochon & Rossi (2003) contend that the substantial cost of relinquishing monetary policy autonomy, along with its respective instruments argue that the cost of relinquishing monetary policy autonomy and its associated instruments makes dollarisation an unsustainable policy. These instruments become particularly essential during extraordinary circumstances, like financial crises or bank runs. A central bank's inability to offer liquidity support during systemic financial crises is a major drawback. Another significant economic cost of dollarisation is the loss of discretionary monetary policy and the exchange rate mechanism. Typically, monetary policy instruments, such as open market operations, are employed to counteract business cycles and asymmetric shocks. Additionally, dollarised countries lack an exchange rate mechanism to adjust during the balance of payments crises (Chang & Velasco 2002).

The debate concerning the lender of the last resort and discretionary monetary policy instruments is complex and often contradictory. Some scholars, like Eichengreen (2002), argue that losing monetary policy control doesn't inherently translate to a disadvantage. Employing a discretionary monetary policy can lead to challenges, including inflation, increased interest rates, and currency depreciation. Following this perspective, the inability to act as the lender of the last resort might actually, strengthen a country's financial system by addressing issues such as the 'original sin' and moral hazard, which are notably prevalent in the financial systems of developing countries.

3.5 Benefits vs. Costs

Numerous studies have attempted to quantify the magnitude of theoretical costs and benefits of dollarisation, aiming to determine the net impact if countries were to adopt such a policy. However, such quantification often proves elusive, resulting in further divergence of opinions on the merits

and demerits of dollarisation. Calvo (2002) suggests that the costs associated with dollarisation are not as significant as theory might suggest. On the other hand, some studies argue that smaller or transitional countries, particularly those susceptible to financial fragility and currency crises, stand to benefit more from dollarisation (Horvath 2005, Nuti 2002).

Dollarisation's potential benefits include improved monetary stability, increased trade levels, reduced interest rates, higher investment levels, bolstered fiscal and financial stability, and ultimately, enhanced economic growth. These benefits, proponents argue, should more than compensate for the costs associated with lost seigniorage and the absence of certain monetary policy functions (Berg & Borensztein, 2000). Conversely, critics argue that the high costs make dollarisation unsustainable in the long run (Alexander & von Furstenberg, 2000). They suggest that it may lead to a worsened fiscal position with more limited resources available for policymakers (Izuerieta, 2002) or result in a lower steady-state growth position compared to countries retaining their currency (Missaglia, 2021).

Although there are disagreements in the literature concerning the benefits and costs of dollarisation, there is unanimous consensus that the theory needs empirical validation. The inconclusiveness in the debate on dollarisation experiences emerges on several grounds. Primarily, there are limited empirical studies on dollarisation experiences, in addition to a relatively short timeframe of analysis within existing studies[4].

4 Empirical Findings from the Literature

Since dollarisation has been debated so extensively based on theoretical grounds, every real-world investigation is important. Edwards & Magendzo (2003) state that major policy decision – like foregoing the national currency, is provided based on limited empirical evidence. These authors claim that investigating aspects such as the impact of dollarisation on output growth, among others, is important and possible. Lin & Ye (2010) highlight that current findings on dollarisation offer mixed results. Levy Yeyati & Sturzenegger (2002) state that the correlation between dollarisation must be based only on empirical evidence.

[4] An intensified discussion on dollarisation emerged during the 2000s, from the consequences of currency and financial crises in freely floating exchange rate regimes of Latin American and East Asian countries (East Asian Crisis), as well as the Argentinian debate to dollarise (Hausman, 1999).

Several studies offer remarkable findings on the impact of dollarisation. For instance, Rose (2000) finds that dollarisation yields a large and significant impact on trade. However, these results received criticism, particularly on the choice of the econometric model (a standard gravity model), which according to Persson (2002) could have magnified the obtained results.

Existing empirical research on dollarisation faces several issues. Many of the studies on the topic were conducted in the early 2000s, a period during which many of the current dollarised countries adopted the policy. Therefore, the bulk of the empirical studies from this period are focused on an investigation of dollarisation experience from Panama and various microstates. However, relying heavily on data from these microstates—often remote islands or colonies—can introduce bias, given the unique compositional features of these territories (Edwards & Magendzo, 2003). Other studies provide an overview of the impact of dollarisation on one or two countries, where Ecuador and El Salvador are the more scrutinised countries.

Many studies in the literature examine the performance of different exchange rate regimes. Rose (2014) analyses the performance of fixed (hard pegs) and floating (with an objective on inflation targeting) exchange rate regimes during the global financial crisis. Interestingly, the study does not find major differences in the performance of economies under the two exchange rate regimes. Though this represents an important finding, particularly concerning the role of currency exchange rate regimes during the financial crises, it raises the question if all fixed exchange rate regimes can be categorised together. Comparing the performance of dollarisation, as one form of extreme fixed exchange rate regime, with other forms of fixed rates is part of the objective of this study, thus assuming that fixed regimes may not be as homogenous as they appear.

4.1 Impact of Dollarisation on Trade

Several studies have found a significant and important impact of dollarisation on trade (Rose 2000, Yeyati & Sturzenegger 2003, Winkler et al. 2004, Gachet 2018). Particularly important is an empirical study on currency unions' impact on trade, where Rose (2000) finds that countries that share a common currency trade over than three times more compared to countries with distinct currencies. This conclusion is based on a gravity model framework, from extensive econometric tests, covering 186 countries in the period between 1970 and 1990.

The findings presented by Rose (2000) sparked an extensive debate among scholars. Subsequently, numerous studies were published, many of which criticised Rose's for overestimation, methodology, selection bias, etc. (Persson 2001, Klein 2002, Levasseur 2004, Nitsch 2002, Wojcik & Backe 2004). While many of these subsequent studies confirmed the findings of Rose (2000) that dollarisation promotes trade, they generally found the effect to be more modest. For instance, Persson (2001) calculates that instead of tripling trade volume, dollarisation should increase trade by around 40%. In contrast, Havránek (2010) conducted a meta-analysis study of 61 studies and found no currency effect within the euro area on trade, except for publication bias. Yet, the same study shows a high trade effect, of over 60%, in other common currency areas.

The positive correlation between trade and dollarisation is also confirmed by other studies. Lin & Ye (2010) ascertain that dollarisation has a pronounced impact on bilateral trade, both between six dollarised countries and the U.S., and also within the dollar zone. Similarly, Gachet (2018) observed that dollarised countries like El Salvador and Ecuador have experienced trade-fostering effects as a result of dollarisation. Klein (2002), on the other hand, challenges the robustness of results on trade, arguing that the trade levels of dollarised countries don't statistically differ from countries under other fixed exchange rate regimes.

One might argue that countries sharing a common currency also tend to be generally geographically closer, as in the case of the European Monetary Union. Such proximity is a natural boosting effect of trade. Therefore, it is unsure whether the common currency is an attributable or even a contributing factor that promotes trade. Nonetheless, it can be argued that the majority of findings from the literature direct to a positive correlation between dollarisation and trade and there appears to be a widespread consensus among scholars on this effect. Further investigation of dollarisation effects on trade, particularly in observing a longer period, as there is currently more experience within the dollarised countries, can provide valuable and more concluding insights on the topic.

4.2 Output Growth Performance of Dollarised Countries

Existing literature suggests that dollarised economies may face inferior economic growth prospects compared to other exchange rate regimes. The output performance of dollarised countries appears to be slower than that of non-dollarised countries and exhibits higher volatility (Edwards & Magendzo 2003, Edwards 2001, Goldfajn & Olivares 2001). Specifically, Edwards & Magendzo (2003) find that the GDP growth differences between dollarised and non-dollarised countries can be as large as 1% annually. Levy Yeyati & Sturzenegger (2003) assert that fixed exchange rate regimes have experienced slower economic growth rates coupled with higher output volatility. Similarly, Goldfajn & Olivares (2001) claim that Panama has shown a lower output growth rate compared to average developing countries and greater volatility, although Panama's growth rate aligns with other Latin American peers. In a theoretical model by Schmitt-Grohé & Uribe (2001), dollarisation is presented as the least successful exchange rate regime in terms of welfare equilibrium.

Palley finds that countries under dollarisation and fixed exchange rate regimes have achieved the benefits of lower inflation but at the cost of reduced output growth (2003). A more recent study by Levy Yeyati (2021) indicates that the experiences of El Salvador and Ecuador don't align with the expected benefits and costs from the literature, especially regarding output growth. Hallren (2014) presents an opposing view, asserting that while dollarisation curbed inflation and enhanced trade, it didn't significantly affect Ecuador's real per capita GDP. Anderson (2016) reaches a contradicting result in analysing over 15 years of dollarisation experience, claiming it was largely beneficial for Ecuador, by boosting trade, investment, and ultimately economic growth. Gachet (2018) find that both Ecuador and El Salvador enjoyed higher trade growth post-dollarisation, arguing that such fostering effects on trade also contributed to higher output growth rates. Similarly, Pasara & Garidziari (2020) note that Zimbabwe's 14-year dollarisation experience positively influenced its economic growth. Other studies also report growth benefits from dollarisation in countries such as El Salvador and Ecuador (Swiston 2011, Soto 2009).

The output performance of dollarised economies merits further analysis and discussion. Findings suggesting a strong negative correlation between dollarisation and output growth have strong implications both for countries considering dollarisation and for those pondering a de-dollarisation future.

4.3 Impact of Dollarisation on Investment

Notably, existing empirical research on the impact of dollarisation on investment is largely scarce. While the link between dollarisation and investment is often discussed theoretically, the empirical evidence remains limited. As previously emphasized, theory mainly pinpoints dollarisation's role in lowering interest rates and facilitating capital markets. However, the absence of monetary policy tools in a dollarised country means that the central bank plays a much-reduced role in policies targeting inflation or interest rates. Investigating the empirical link between dollarisation and investment is crucial, especially considering the role of investments in enhancing a country's productivity growth.

Among the few studies on this topic, Edwards & Magendzo (2003) claim that Panama's investment levels have been lower compared to non-dollarised countries, attributing this to trade shocks and shifts in the current account balance. A more recent study by Lyzun et al. (2019) finds that common currency arrangements have led to lower interest rates; however, they don't examine investment levels.

4.4 Impact of Dollarisation on Inflation

This paper primarily focuses on evaluating the impact of dollarisation on real economic variables, influencing aggregate demand, including trade, investment, and output growth. Nonetheless, it is worthwhile to highlight the extensive literature discussing dollarisation's effect on other variables, notably inflation. One of the most consistent, and widely accepted, empirical findings is that dollarisation leads to reduced inflation. A vast majority of studies find that dollarised countries have indeed benefited from lower inflation rates (Hallren 2014, Swiston 2011, Edwards & Magendzo 2003, Edwards 2001, Goldfajn & Olivares 2001).

Existing studies based on empirical analyses—whether conducted in individual countries like Panama, El Salvador, and Ecuador or spanning across several dollarised countries, and utilizing different methodologies—consistently reveal a significant dampening effect of dollarisation on inflation. these findings validate one of the theoretical benefits of dollarisation: that the adoption of

a stable foreign currency (such as the U.S. Dollar or the EURO), thereby adopting a credible monetary policy of mature institutions, leads to lower inflation levels.

A currency union, particularly within the euro area, has also proven beneficial in lowering inflation. Hartmann & Herwartz (2013) compare inflation between the eurozone and other countries, claiming that the eurozone has experienced lower inflation levels. Similarly, Caporale et al. (2010) argue that since the introduction of the euro, the European Central Bank has managed to reduce inflation uncertainty and maintain stable inflation levels effectively.

5 Research Methodology

5.1 Research Scope and Data Collection

The primary objective of this study is to assess the impact of dollarisation on real economies. This study augments the current literature by exploring an extended period of dollarisation experience. Additionally, we assess the performance of dollarised countries both in aggregate and during specific timeframes, aiming to provide a more comprehensive and unbiased perspective on the efficacy of dollarisation as an exchange rate regime. Ultimately, this study seeks to bridge the gap between theory and empirical evidence in the dollarisation discourse, addressing the notable scarcity of empirical findings on this subject—a gap highlighted repeatedly in prior research.

This study evaluates the performance of dollarised economies in terms of annual average real growth rates in output[5], investment[6], and trade[7], as well as current account balance rates, and growth volatility[8], through comparative analysis. The assessment of trade levels further delves into a comparative analysis of real growth rates in import and export, as well as the current account balance[9] of dollarised economies compared to non-dollarised ones.

This study is centred around the performance of seven dollarised countries, namely: Panama, Ecuador, El Salvador, Kosovo, Montenegro, Timor-Leste, and Zimbabwe. While there are other

[5] Further information on macroprudential tools, variables and sources is provided in Appendix 3
[6] Investment data is obtained by the World Bank, World Development Indicators, which defines investment as: "Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories."
[7] Trade data is obtained by the World Bank, World Development Indicators, which defines trade as: "the sum of exports and imports of goods and services measured as a share of gross domestic product."
[8] Growth volatility has been calculated as the standard deviation of real GDP growth rates for the examined period.
[9] Current Account Balance data is obtained by the World Bank, World Development Indicators.

dollarised countries as well, they have been excluded from this analysis. Many of these excluded countries are either microstates or isolated islands which, as per existing literature, might include potential bias (Rose 2000, Winkler et al. 2004). This paper focuses on emerging economies, and all micro-states and well-advanced economies have been excluded. For the former, a threshold for population size has been applied, excluding all states that have less than 400,000 inhabitants. As a result, this study represents a comparative assessment of economies with over 400,000 inhabitants. Well-advanced economies were excluded because all dollarised countries are emerging economies. The final sample pool consists of 139 countries, of which 4% (or seven countries) are dollarised. Full lists of countries, as well as variables and sources are provided in Appendices 2 and 3, respectively.

The majority of the dollarised countries studied have over two decades of dollarisation experience. This length of experience is especially valuable and studying it has been possible primarily due to the timing of this research study. In contrast, many previous studies on dollarisation, which were published mainly in the early 2000s, did not have this advantage. Much of the analysis in this paper focuses on the 22 years of dollarisation experience, spanning from 2000 to 2021. Additional analysis of the period before the COVID-19 pandemic and the last 10 years is also included. This comprehensive timespan provides a robust basis to assess the effectiveness of this exchange rate regime policy. Furthermore, evaluating over two decades of experience helps to balance potential biases, offsetting short-term economic fluctuations from events like the global financial crisis.

This paper presents the results of multiple exhaustive tests that aim to understand the impact of dollarisation as a currency exchange regime. We evaluate this by assessing many aspects and periods of the dollarisation experience. The following list represents the analysis conducted to understand the impact of dollarisation:

1. General evaluation of economic performance between dollarised and non-dollarised countries for the 2000-2021[10], 2000-2019, and 2012-2021 periods. The 2012-2021 timeframe has been studied through two different methodological specifications[11].

[10] As previously stated, countries that have less than 400,000 inhabitants and well-advanced economies are excluded from the pool of analysis.

2. Comparative assessment of the economic performance of dollarised and five other currency arrangement categories separately, specifically:
    a. Dollarised compared to currency board arrangement,
    b. Dollarised compared to soft peg arrangement[12],
    c. Dollarised compared to residual[13]
    d. Dollarised compared to floating[14]
    e. Dollarised compared to currency unions[15]
3. Additional assessments focused solely on the times of the two crises:
    a. Evaluation of the economic performance between dollarised and non-dollarised countries during the COVID-19 pandemic crisis, specifically the years 2020 and 2021.
    b. Evaluation of the economic performance between dollarised and non-dollarised countries during the global financial crisis, specifically the years 2008 and 2009.

To address the hypothesis in this research, panel and time-series data are utilized, using secondary data sources from the World Bank and International Monetary Fund databases.

5.2 Evaluation Framework

Evaluating the impact of dollarisation, in theory, requires an experiment with one group of treated countries and another of control countries with identical conditions. This is not however possible in the real world, where countries are not identical, but rather very different, and experiments are not usually applied with major policies such as abandoning altogether a legal tender. To implement the comparative analysis between the dollarised countries (treated group) and non-dollarised countries

[11] The baseline year of certain covariates in the propensity score matching have been adjusted. In the first specification the baseline year is 2000. In the second specification the baseline year is 2011. This has been applied to address potential endogeneity and bias.
[12] According to the IMF (2021), soft peg arrangements include the following: conventional peg, stabilized arraignment, crawling peg, and pegged exchange rate with horizontal bonds.
[13] According to the IMF (2021), residual arrangements are other managed arrangements – between soft pegs and floating regimes.
[14] According to the IMF (2021), floating arraignments include the following: floating and free-floating currency exchange rate arrangements.
[15] Including two currency unions: the Eurozone and the Central African Franc Zone. Since majority of the countries that are part of the Eurozone are well-advanced economies, are excluded from the study.

(control group) this study utilizes a matching model. Two major forms of matching models have been used in literature, the matching estimator technique through propensity score matching and the synthetic control method.

The first technique, known as the matching estimator, is based on propensity score matching, and has been utilised in studies by Edwards & Magendzo (2003), Edwards (2001), Lin & Ye (2010), and Pasara & Garidzirai (2020). Originally introduced by Rosenbaum & Rubin (1983), this technique was devised to estimate the outcomes of training programs on individuals. It does so by pairing a statistical control group, which never took part in the program, with a treatment group that's matched based on specific covariates (characteristics). As noted by Heinrich et al. (2010), propensity score matching has emerged as a leading method, that employs algorithmic computations to match treatment groups with control groups (nonparticipants), using the units' characteristics (covariates) as a basis. The methodology has been further refined and expanded upon in subsequent works by Heckman *et al*. (1998), Lechner (1999), Blundell & Costa Dias (2000), Dehejia & Wahba (2002), and Smith & Todd (2005).

The second method, the synthetic control method, was developed by Abadie and Gardeazabal (2003) to estimate the economic costs of conflict. It represents a method to develop a synthetic counterfactual for the treated unit. In essence, the synthetic control method creates a scenario where the treated unit was not exposed by using covariate information from its pre-treatment period and comparing it with untreated units. This method has grown in popularity across various fields to estimate treatment impact. Hallren (2014) used it to assess the impact of dollarisation in Ecuador and the currency board arrangement in Argentina, while Gachet (2018) evaluated the impact of dollarisation in Ecuador using the same approach. However, most existing studies on dollarisation with this methodology have focused on a single unit. Abadie (2021) noted that the synthetic control method might not be ideal for multiple treatment units due to potential biases when synthesizing controls from several units.

This study employs the matching estimator technique using propensity score matching for two primary reasons. First, the study aims to capture the impact of dollarisation by observing multiple instances of dollarisation. The synthetic control method, however, has limitations when combining

observations from several units. Second, the absence of pre-treatment data from many dollarised countries makes alternative methods less suitable.

The model in this study is primarily influenced by the methodology used in Edwards & Magendzo (2003) and Lin & Ye (2010). Both these studies employ a matching estimator using propensity score matching, which presents the central model of the econometric analysis used in this study as well. While the main structure of the analysis and the tests conducted mirror the aforementioned studies, there are notable differences in the model applied here.

Initially, this study focuses on countries with over 400,000 inhabitants[16][17] that are classified as emerging economies[18]. Edwards & Magendzo (2003) and Lin & Ye (2010) neither set population thresholds nor exclude well-advanced economies. Furthermore, the selection of covariates, which are used for determining the propensity score matching is slightly different in this study. This study utilises seven covariates to determine the matching estimator. The selected covariates for this study are: GDP per capita at purchasing power parity (PPP), log of population number, trade as a percentage of GDP, current account balance as a percentage of GDP, two proxies for quality of governance and policies, and a category variable for geographical region[19]. The two proxies for quality of governance and policies are a business indicator, the ease of doing business score from the Doing Business report and the Regulatory Quality metric from The Worldwide Governance Indicators (WGI), both of which are published by the World Bank. The selection of these variables is based largely on the two aforementioned studies.

The selection of the GDP per capita, trade, and current account balance aims to assess the economic similarities between countries. The two proxies for quality of governance and policies are used to gauge the institutional framework level. The log of the population number captures the country's size, while the geographic region captures the location (reflecting on the theory of

[16] The 400,000 inhabitants threshold has been set to exclude dollarised, as well as non-dollarised, countries that can be categorized as microstates. It has been continuously outlined in the literature that such entities have unique characteristics (i.e., with very few populations, isolated remote islands, etc.) and can therefore present biased results in terms of the impact of dollarisation as a policy.

[17] The database includes also periods where specific countries had less than 400,000 inhabitants. This threshold has been applied to the final period (the year 2021) of entities, therefore previous periods have also been acquired.

[18] Well-advanced economies have been excluded from the study given that the pool of all dollarised countries are emerging economies.

[19] Based on their geographical position, countries have been assigned in one of the five regions: Asia, Africa, Europe, Americas, and Oceania).

geographic convergence). The GDP per capita variable, when considered in purchasing power parity, intends to account for the beta-convergence effect. The values for the three economic indicators (GDP per capita, trade, and current account balance) are set with the year 2000 as the baseline[20], during which most countries adopted dollarisation[21]. This approach minimizes endogeneity and potential bias from incorporating values that might have been affected by dollarisation. Notably, the choice of these seven indicators results in a robust model, as all matching estimators are highly significant in most analyses (including the main 22-year period analysis). Thus, it can be concluded that the balancing properties of the propensity score tests are met.

For evaluations between dollarisation and individual exchange rate regimes, the selection of covariates has been adjusted to enhance propensity-matching significance. Given the smaller sample size for individual exchange rate regimes compared to the broader sample, the number of covariates was reduced to five. Specifically, "current account balance" and "region" were omitted. This revision was crucial as the initial covariate setup didn't yield significant propensity matching. Additionally, model modifications were applied to the analyses of the two crisis periods: the COVID-19 pandemic and the global financial crisis, detailed further in the respective sections.

5.3 Econometric Framework

The econometric framework of this study employs a matching method based on propensity scores. The impact of the dollarisation experience is evaluated using the average treatment effect on the treated (ATET) by comparing results between dollarised (treated) and non-dollarised (control) groups, through the application of several tests. The sample for the control group is selected based on the propensity score matching, which estimates the conditional treatment probability of a country becoming dollarised. These propensity scores determine the likelihood that a non-dollarised country would undergo dollarisation by matching certain characteristics between the two groups. Specifically, the chosen covariates in this study that inform these "characteristics" include

[20] In cases where dollarisation has occurred in subsequent years, the values from the dollarisation year were assigned as baseline (only from the dollarisation year and onwards).

[21] For the second specification covering the period 2012-2021, as well as the assessments for the COVID-19 period (2020-2021) and the global financial crisis (2008-2009), an alternative specification was used. In these cases, baseline values were assigned for the year preceding the period under examination.

GDP per capita, log of population, trade, current account balance, two proxies for governance quality and policy, and geographical region.

The initial stage of the econometric analyses involves a probit model for the calculation of propensity scores. This is conducted preliminary across all tests and periods when evaluating the impact of dollarisation. In this model, dollarisation serves as the independent variable and is represented as a dummy variable: dollarised countries are coded as '1', while non-dollarised countries receive a '0'. The propensity score is derived to estimate the likelihood of a country undergoing dollarisation, based on this dummy variable and the selected covariates.

The second phase of the econometric analysis involves multiple tests designed to assess the impact of dollarisation as a currency regime. Various testing methods and periods are employed to evaluate the influence of dollarisation on primary indicators such as real growth rates of GDP, investment, trade, and growth volatility. Secondary indicators, including real growth rates of import, export, and the current account balance, are also assessed. These econometric evaluations rely on the average treatment effect on the treated via propensity score matching. Below is the basic equation form used to compare outcome variables between dollarised and non-dollarised countries:

$$y = \begin{cases} y_1 \; if \; D = 1 \\ y_0 \; if \; D = 0 \end{cases} \tag{1}$$

The variable y represents the dependent variable. Depending on the specific outcome being measured, it could signify the real growth rates of GDP, investment, trade, import, and export, as well as GDP growth volatility and growth rates of current account balance[22]. The outcomes from the dollarised countries are presented by y_1, while the outcomes of the non-dollarised countries are represented by y_0, where the values 0 and 1 correspond to non-dollarisation and dollarisation states, respectively.

Besides setting a baseline year for economic covariates, we conducted a specific exercise by excluding Panama[23] – given its status as a more mature dollarised economy. However, tests that omitted Panama from the sample yielded results consistent with the full sample. Hence, the results discussed here include the full sample. For one of the primary timeframes analysed, namely the last

[22] Data on current account balance has been winsorized at the 5% level to reduce bias from outliers.
[23] Panama presents an outlier in the existing pool of dollarised economies as it dollarised in 1904.

decade (2012-2021), we employed two specifications: one with a baseline year of 2000 and another with 2012 for economic covariates. As shown in the findings section, both specifications yield closely aligned outcomes. To further reduce bias and enhance the validity of our results, we utilized various testing methods for calculating ATET. This includes several matching estimator tests such as kernel, nearest neighbour, and radius matching[24], in addition to a nonparametric bootstrap estimation. A detailed discussion of these methods will follow in the next section. An in-depth explanation of these techniques follows in the subsequent section.

5.4 Average Treatment Effect on the Treated

As already indicated, the treated group is comprised of dollarised countries, while the control group is of non-dollarised countries. The equation below shows the mathematical form of the methodology:

$$ATET: E(Y_1 - Y_0 |\ D = 1) = E(Y_1 | D = 1) - E(Y_0 | D = 0) \quad (2)$$

Where, Y_1, refers to the outcome of countries that have undergone dollarisation with regards to the variable of interest (i.e., real GDP growth rate), and Y_0 to the outcome the outcome of countries that have not. The variable D serves as a dummy variable for dollarisation, where D=1 implies that the country is dollarised.

Observation of identical units from the treated and control groups that are under identical conditions is impossible with the dollarisation experience of countries. Instead, propensity score matching is used to match observations from the treated and control groups, while outcomes between the matched samples of treated and control groups are compared afterwards. Given this approach, the mathematical representation of the comparison is articulated as follows:

$$ATET: E(Y_1 - Y_0 |\ p(x), D = 1) = E(Y_1 | p(x), D = 1) - E(Y_0 | p(x), D = 0) \quad (3)$$

The revised equation incorporates the propensity score matching, as p(x). This score facilitates the matching of observations between samples of treated and control groups. In this study, three matching methods have been utilized, as inspired by the methodologies found in Edwards & Magendzo (2003) and Lin & Ye (2010). For the nearest neighbour matching, we examined three

[24] Econometric tests for matching estimators have been conducted through the Stata application using the PSMATCH2 (Leuven & Sianesi 2003).

variations, using one, three, and five nearest neighbours respectively. Likewise, for radius matching, three radii have been explored: 0.002, 0.02, and 0.2. Each of these matching estimators deploys distinct matching techniques between the treatment and control groups.

Kernel matching estimators calculate matching weights based on the propensity score of treated and control groups. According to Blundell & Costa Dias (2005), this estimator generates matching weights of matching by juxtaposing each observation in the treated group with all observations in the control group. The subsequent evaluation of outcomes is grounded on these matching weights. In this context, observations between treated and control groups that possess higher weights signal greater 'similarities' and are consequently compared. Conversely, those with lower weights signify minimal alignment and are thus excluded.

The nearest neighbour estimator employs a straightforward matching technique in which each observation from the treated group is paired with a corresponding observation from the control group based on their propensity scores (Rubin, 1979). In the case of one nearest neighbour matching, observations from the treated group are paired with the closest or most similar propensity score observation from the control group.

Radius matching, often called caliper matching, pairs observations from treated and control groups based on predefined ranges of propensity scores. These ranges are defined by high propensity scores. This method can be an effective alternative to the nearest neighbour approach, especially when the closest matches between treated and control groups aren't particularly similar, as highlighted by Dehejia & Wahba (2002) and Caliendo & Kopeinig (2008).

The use of diverse matching techniques aims to mitigate potential bias arising from the shortcomings of individual techniques. This multifaced approach seeks to enhance the validity and reliability of results. Comprehensive results from each test and related outcome variables are elaborated upon in the following section, with a complete breakdown available in Appendix 1.

6 Findings

This chapter presents findings derived from the econometric tests conducted to evaluate the dollarisation experience. We begin by providing summary sections of results that compare outcome differences between dollarised and non-dollarised countries, distinguishing between unmatched

and matched variables. The general dataset used for this study consists of 139 countries over a period of 22 years, resulting in a total of 3,058 observations. This evaluation period commences in the year 2000 and concludes in 2021. Notably, seven countries, representing 5% of the total, have adopted dollarisation. Given the existing number of countries and the significant duration covered, this dataset offers a comprehensive insight into whether dollarisation as an exchange rate regime has delivered results that are superior, inferior or similar to other currency exchange rate regimes.

This chapter unfolds as follows. We begin with summaries of unmatched and matched results. This is followed by a detailed discussion on the comparative analysis of the dollarisation experience across the three examined periods. We then explore one-to-one evaluations of dollarisation against various exchange rate regimes: currency board, soft peg, residual, floating, and currency unions. Lastly, we present a section on two specific periods of crises, namely the COVID-19 pandemic and the global financial crisis.

6.1 Summary of Unmatched Results

This section provides summaries of unmatched results across three periods (2000-2021, 2000-2019, 2012-2021), as well as comparative analyses between dollarisation and other distinct currency exchange rate regimes.

Upon initial examination, the macroeconomic performance of dollarised countries appears distinct from non-dollarised ones. Across multiple indicators and periods assessed, dollarised economies tend to outperform their non-dollarised counterparts, especially in the growth rates of investment, trade, import, export, and GDP growth to an extent. However, in two periods of study (2000-2021 and 2012-2021), dollarised countries displayed higher output growth volatility and more negative current account balance growth. Interestingly, the period prior to the COVID-19 pandemic was associated with a consistently superior performance for dollarised countries across all indicators. A comprehensive breakdown of these observations is presented in the subsequent table. However, it's crucial to note that subsequent matched and econometric tests don't consistently confirm these initial findings.

Table 1. Summary of unmatched results for dollarised vs. non-dollarised countries.

	Period	Period	Period
	2000-2021	2000-2019	2012-2021

Outcome variable		dollarised	non-dollarised	dollarised	non-dollarised	dollarised	non-dollarised
Real GDP Growth	obs	122	2,829	110	2,581	64	1,278
	mean	4.02	3.95	4.34	4.31	3.26	2.82
	st. dev.	5.57	5.95	4.46	5.50	5.96	6.22
GDP Volatility	obs	132	2,900	120	2,640	64	1,306
	mean	5.01	4.66	3.51	4.06	5.76	4.44
	st. dev.	1.64	3.59	2.48	3.57	1.72	4.29
Investment Growth	obs	132	2,750	120	2,480	64	1,206
	mean	4.97	1.91	5.68	2.86	-1.72	-3.21
	st. dev.	1.49	17.40	2.95	18.77	8.47	18.16
Trade Growth	obs	132	2,750	120	2,520	64	1,206
	mean	4.07	1.60	3.33	2.02	1.06	-2.67
	st. dev.	4.68	5.62	3.07	5.95	9.78	7.37
Import Growth	obs	59	1,833	120	2,520	40	860
	mean	4.54	2.45	2.55	2.47	1.75	-1.60
	st. dev.	0.90	4.93	2.93	5.76	1.81	6.31
Export Growth	obs	59	1,833	120	2,520	40	860
	mean	4.36	2.26	12.38	2.55	4.25	-1.91
	st. dev.	2.24	5.72	19.45	6.84	3.31	6.62
Curr. Acc. Balance Growth	obs	132	2,684	120	2,440	64	1,206
	mean	-33.95	2.04	17.44	10.18	-94.31	-11.79
	st. dev.	87.99	116.38	43.85	122.08	123.57	149.54

In the comparative analyses between dollarisation and individual exchange rate regimes, there are more observations for other regimes than for dollarised countries. In general, countries with varying exchange rate regimes displayed different performance on the studied variables. Dollarised countries rank among the exchange rate regimes with higher rates of trade, import, export, investment, GDP volatility, and GDP growth. However, they also exhibit negative current account balance rates.

According to simple unmatched statistics, countries with residual exchange rate regimes surpass dollarised countries in terms of real GDP growth levels. Nonetheless, dollarised countries showcase superior output growth levels to all other exchange rate regimes. Similarly, dollarised countries show the second-best performance in terms of investment, just behind currency union countries. This pattern continues for real rates of trade, albeit for the import and export, dollarised countries lag slightly behind countries with currency board arrangements and currency unions. Contrary to general statistics contrasting dollarised and non-dollarised economies, dollarised countries have the second-lowest output growth volatility when compared to individual exchange rate regimes, only surpassed in stability by floating regimes.

When comparing dollarised countries to their matched counterparts based on covariates, the results diverge significantly from the unmatched findings. The subsequent table provides a detailed breakdown of simple statistical means across different exchange rate regimes. It's important to emphasize that these observations and commentaries are not to be interpreted as findings and conclusions of the study. For drawing inferences, this research strictly utilises the ATET matching based on the propensity score methodology.

Table 2. Summary of unmatched results for dollarised vs. individual currency exchange arrangements.

		Currency Exchange Arrangement					
Outcome variable		dollarised	currency board	soft peg	residual	floating	currency union
Real GDP Growth	obs	122	214	1,268	661	795	447
	mean	4.02	2.93	3.91	4.27	3.52	3.74
	st. dev.	5.57	6.87	6.63	5.96	5.68	7.08
GDP Volatility	obs	132	239	1,300	681	822	458
	mean	5.01	5.89	5.29	5.05	4.62	5.80
	st. dev.	1.64	5.20	4.44	3.74	3.27	4.96
Investment Growth	obs	132	239	1,251	647	755	458
	mean	4.97	-12.28	2.30	2.12	3.70	6.21
	st. dev.	1.49	51.09	7.15	9.37	8.15	6.59
Trade Growth	obs	132	239	1,251	647	755	458
	mean	4.07	2.56	0.75	0.35	1.90	4.25
	st. dev.	4.68	4.91	5.60	6.64	4.51	4.64
Import Growth	obs	59	139	673	441	598	270
	mean	4.54	4.60	2.01	1.11	2.42	5.84
	st. dev.	0.90	2.71	4.79	5.24	4.10	3.28
Export Growth	obs	59	139	673	441	598	270
	mean	4.36	4.99	1.66	0.64	2.45	5.80
	st. dev.	2.24	3.97	5.65	5.90	4.66	5.02
Curr. Acc. Balance Growth	obs	132	195	1,177	631	757	348
	mean	-33.95	-11.49	6.38	8.56	-0.69	-30.93
	st. dev.	87.99	31.58	122.79	90.55	108.68	108.71

6.2 Summary of Findings – Dollarised vs. non-Dollarised Matched Results

The matched comparative assessment between dollarised and non-dollarised countries is conducted for three periods. While the primary duration covers 22 years, the two other intervals explored are the 20-year period from 2000 to 2019, which excludes the influence of the COVID-19 pandemic crisis, and the most recent decade from 2012 to 2021. This last period is analysed using two different model specifications: one with several covariate baseline data from 2000 and the other from 2011. The three timeframes are designed to provide long-term trends in dollarisation, negate

potential biases introduced by the pandemic, and capture insights from the post-adoption decade for most dollarised countries[25].

In all three studied timeframes, the propensity matching of covariates yields a relatively high significance. For the primary 22-year duration, all matching estimators are significant, with seven variables at 1% and one at 10% significance. For the 20 years from 2000 to 2019, five out of seven covariates are significant, while for the most recent decade from 2012 to 2021, six out of seven covariates are significant for both specifications, all at the 1% level. Given the considerable number of covariates and their marked significance, this reinforces the validity of our propensity score matching approach. Additionally, we further assessed potential bias by excluding Panama, a notably mature dollarised economy. The outcomes from this test were consistent with the primary study's findings in terms of outcome variable significance. Hence, the results discussed in this section are based on the comprehensive sample of dollarised countries for the outlined periods.

Below is a summary and discussion of the key outcomes from our econometric analyses. A concise overview of our findings can be found in Table 3, with a comprehensive breakdown of all the econometric tests conducted for this study available in Appendix 1.

A key result from this study is that dollarised countries did not consistently show higher or lower growth levels than their non-dollarised counterparts. This contradicts the arguments by Berg & Borensztein (2000), Hanke & Schuler (1999), Kotios (2001), and findings by Edwards (2001), Edwards & Magendzo (2003), Gachet (2018) and Anderson (2016). However, one exception is noted for the 20 years preceding the COVID-19 pandemic, dollarised countries showed a higher tendency for real GDP growth. This trend, however, was confirmed in only four of our eight evaluation tests, with significance levels at 5% and 10%. Given that such a finding isn't robust, our analysis spanning periods of 22, 20, and 10 years doesn't conclusively attribute changes in real output growth to dollarisation.

[25] Five out of seven countries dollarised in the early 2000s: Ecuador, El Salvador, Kosovo, Montenegro and Timor-Leste.

Table 3. Summary of results for dollarised vs. non-dollarised countries.

Outcome	2000-2021	2000-2019 (Excluding the COVID-19 Pandemic)	2012-2021 (the last 10 years) 1st specification	2012-2021 (the last 10 years) 2nd specification
Real GDP growth	no difference	higher tendency[26]	no difference	no difference
Growth volatility	no difference	no difference	higher	higher
Investment	higher	higher tendency	higher	higher
Trade	higher	higher tendency	higher	higher
Import	higher	higher tendency	higher	higher
Export	higher	no difference	higher	higher
Current account balance	negative	positive tendency	negative	negative

Another pivotal finding in this study is that, aside from real output growth rates, dollarised countries consistently exhibited different performance compared to their non-dollarised counterparts across all other studied indicators. Our results indicate that in the last decade, dollarised economies were linked with increased volatility, a finding that was statistically significant across all evaluation techniques and reached 1% significance in seven of the eight tests. Notably, this difference in output volatility isn't observed for the other two tested timeframes, suggesting that the initial stages of dollarisation were characterized by less output volatility. While not consistent across all periods, the observation that dollarised countries tend to exhibit higher growth volatility challenges theoretical expectations. The theory suggests that dollarisation should enhance macroeconomic stability through deeper financial integration, reduced financial crisis incidences, and improved fiscal discipline. However, in contrast to this theoretical framework, our results align with empirical studies like those by Edwards (2001) and Goldfajn & Olivares (2001).

In line with the theoretical benefits of dollarisation on investment, especially concerning improvements in financial prudence and the subsequent reduction in interest rates, we observe that dollarised countries have witnessed higher investment levels. Specifically, our findings are particularly robust for the 2000-2021 period, with significance in seven out of eight tests (1% significance level, except one instance with 5%). This suggests that dollarised countries saw an increase in real investment growth by approximately 2.5-3.9 percentage points. During the last

[26] We define a difference (higher, lower, or positive) between dollarised and non-dollarised countries based on significance tests, in which at least 6 out of 8 tests that were conducted have produced significant results. Whereas a tendency (higher tendency) is defined when statistical significance has resulted in 4 out of 8 tests and at least two different testing methods. Detailed results of econometric tests are presented in Appendix 1.

decade, the investment growth rate for dollarised countries was even more pronounced, registering between 4.5 to 8.4 percentage points higher, depending on the specific test outcome. This strong trend is not as evident for the 2000-2019 period, where evidence of dollarised countries having higher investment rates emerges in just five of the eight tests. Our finding contradicts Edwards & Magendzo (2003), who previously found that dollarised countries registered lower investment levels. While empirical data regarding the effects of dollarisation on investment is limited, the prevailing theory suggests a positive correlation.

A strong positive correlation exists between dollarisation and the real rate of trade growth. Dollarised countries tend to register higher trade growth rates. This trend is most evident in the periods 2000-2021 and 2012-2021. Over the 22 years, the trade growth difference ranges between 2.5 to 3.9 percentage points. For the last decade, trade growth in dollarised countries has been notably higher, especially when assigning a baseline for certain covariates to the year 2011 (in the second specification). In this case, the growth difference ranges from 4.3 to 8.4, depending on the econometric tests, and is significant at 1% in seven of the eight tests. Notably, while a trend linking dollarisation to trade growth is observed, its strength is not consistent across the 20-year period from 2000-2019. The findings concerning trade confirm the theory on dollarisation benefits. Moreover, these results align with the empirical findings of Rose (2000) — a study that sparked considerable debate — as well as with subsequent research and prevailing theories on dollarisation and trade.

The correlation between dollarisation and trade is also consistent with real rates of import and export growth. In both cases, we find a more robust correlation for the 22 years between 2000-2021 and the 10-year period between 2012-2021. A weaker link is observed for the 20 years prior to the COVID-19 pandemic when no difference between dollarised and non-dollarised economies is observed related to exports and only a higher tendency for imports. This implies that dollarised countries have intensified trade during more recent years, a finding that is confirmed by highly robust results on the comparison of imports and exports of dollarised and non-dollarised countries during the last decade. In both model specifications, there is high significance that dollarised countries have enjoyed higher real growth rates of import and export.

In detail, the real rate of import growth for dollarised countries appears higher for an average of 3.3 percentage points for the 22-year period examined compared to non-dollarised matched counterparts. This trend is even higher for the last decade when on the first model specification (baseline year for certain covariates 2000) the real rate of import growth among dollarised countries is around 4.1-6.2 percentage points and around 4-8.5 percentage points for the second model specification (the baseline year 2011). The results for the latter are particularly robust, significant at 1% across all econometric tests.

A similar trend is also observed regarding exports. Dollarised countries have enjoyed higher real growth rates of an average of 3.4 percentage points during the 22-year period compared to non-dollarised counterparts. The growth is even higher during the last decade, with higher export growth rates of 5.4-8.9 for the first specification and 6.6-9.6 percentage points for the second specification. The results of the last decade are particularly robust, with one at 5% significance and the rest at 1%.

In dollarised countries, the 2000-2021 and 2012-2021 periods exhibited more negative growth rates for the current account balance. These same periods also showed increased trade growth, predominantly from exports. This suggests the decline in the current account balance is linked to the surge in exports. However, from 2000-2019, leading up to the COVID-19 outbreak, dollarised countries displayed a more positive tendency on the current account growth trend compared to non-dollarised economies. Notably, this period witnessed no significant variance in export growth among dollarised countries. In addition to the impact of exports on current account balance, the pronounced negative growth in current account balances in more recent years can likely be attributed to the economic implications of the pandemic, especially with interruptions in remittances.

6.3 Dollarised vs. Individual Currency Exchange Rate Regimes

Evaluating the experience of dollarisation against other individual currency exchange rate regimes is based on a 22-year period (2000-2021). For these evaluations, we adjusted the main covariate model, omitting 'current account balance' and 'region' to enhance the significance of the propensity score matching model. This modification resulted in achieving matching significance across all

covariates for evaluations against currency board, residual (all at 1%), and currency union (all at 1%) exchange rate regimes. While evaluations against soft peg and floating arrangements did not yield significance across all covariates, their results are still discussed in this paper. However, it's crucial to note that these discussions are based on a nonsignificant matching estimation. The absence of significance may stem from inherent differences between countries under soft pegs, floating, and dollarisation regimes.

Our research indicates that the performance of dollarised countries varies when compared to different exchange rate regimes. To summarise, dollarised economies exhibit better outcomes in specific indicators when compared to floating exchange rate regimes. This superiority is followed to some extent against residual and soft pegs as well. Conversely, when matched with countries under currency unions or currency boards, dollarised economies tend to underperform in certain areas. Reinforcing the primary findings of this study on output growth, there is no significant distinction in real GDP growth for dollarised countries also when directly compared to other exchange rate regimes.

When analysing dollarised countries in comparison to those with soft peg, residual, and floating exchange rate regimes, a consistent pattern emerges. Dollarised countries consistently exhibit notably higher real growth rates in investment, trade, import, and export compared to their counterparts with soft peg, residual, and floating regimes. Moreover, dollarised countries tend to have more pronounced negative growth rates in their current account balances when compared to countries with soft peg and residual arrangements. Interestingly, this distinction doesn't hold when compared to countries with floating exchange rate regimes; no significant differences are observed in that case. This aligns with Swiston (2011), who argues that dollarisation would likely yield better outcomes compared to floating exchange rate regimes, given its potential to protect economies from speculative attacks.

The experiences of countries with currency board arrangements and those in currency unions, when compared with dollarisation, diverge considerably from the overarching analysis presented in prior sections. Although these regimes fall under the umbrella of fixed exchange rate regimes, substantial distinctions become evident between dollarisation, currency board arrangements, and currency unions. This contrast is most pronounced for countries with currency board arrangements;

they display notably different outcomes in six out of the seven variables tested when compared with dollarised countries.

We observed that countries with a dollarised regime have a tendency towards greater output volatility and deeper negative trends in current account balance growth compared to the two aforementioned fixed regimes. Furthermore, economies with currency board arrangements manifest significantly heightened trade and export levels vis-à-vis dollarisation, opposing the general findings from this study on dollarisation's benefits. These observations imply that contrary to prevailing theory, fixed exchange rate regimes are not homogenous.

Table 4. Summary of individual comparative results between dollarisation and other currency exchange rate regimes.

Outcome	vs. Currency Board Arrangements	vs. Soft Peg Arrangements	vs. Residual Arrangements	vs. Floating Arrangements	vs. Currency Union Arrangements
Real GDP growth	no difference	no difference	no difference	no difference	no difference
Growth volatility	higher	no difference	no difference	no difference	higher
Investment	higher tendency	higher	higher	higher	no difference
Trade	lower	higher	higher	higher	no difference
Import	higher	higher	higher	higher	no difference
Export	lower	higher	higher	higher	no difference
Current account balance	negative	negative	negative	no difference	negative

A comprehensive summary of findings contrasting dollarised countries with distinct currency exchange rate regimes is presented in the subsequent table. All detailed insight into the econometric tests used throughout this study is presented in Appendix 1.

6.4 The COVID-19 pandemic and the global financial crisis

The years 2000-2021 witnessed two unprecedented crises with significant economic impacts: the global financial crisis and the COVID-19 pandemic. To enhance our analysis and gain deeper insight into dollarisation during these crises, we isolated these periods and examined the effects of dollarisation in comparison to their non-dollarised counterparts.

While this approach offers valuable insights, certain limitations require cautious interpretation. First, the time observations for each crisis extend only two years, constraining the reliability of propensity score matching - which gains accuracy over extended observation periods. Secondly, the brief time span necessitated reducing the covariate count for propensity score matching. After examining various configurations, the final model comprised just two covariates - the logarithmic function of population and region. This was the sole combination yielding significant results in our matching estimations. A summary of findings from these two periods is presented in Table 5.

Table 5. Summary of results for dollarised vs. non-dollarised countries for the two crisis periods.

Outcome	2020-2021 COVID-19 Pandemic	2008-2009 Global Financial Crisis
Real GDP growth	no difference	no difference
Growth volatility	higher tendency	no difference
Investment	no difference	higher tendency
Trade	no difference	no difference
Import	no difference	no difference
Export	higher	no difference
Current account balance	negative tendency	positive tendency

During the COVID-19 pandemic, dollarised economies showed an increased tendency toward output growth volatility. Yet, this observation only holds significance (at levels between 1% and 5%) in only half of our econometric tests, implying limited robustness. A similarly constrained robustness is evident also when observing more negative growth rates in their current account balances among dollarised countries during the same timeframe. Notably, the most consistent result — significant in seven out of eight tests and ranging between 5% and 10% — is the marked rise in real export growth rates for the 2020-2021 period. Given the pronounced disparity in these obtained results, it's essential to interpret these findings cautiously, considering the inherent sensitivity of the analysis.

In contrast, fewer disparities are evident between the performance of dollarised and non-dollarised economies during the global financial crisis. Notably, differences arise in only two indicators: investment and the current account balance. These findings, however, are weak, resulting in a 10% significance level in just half of the econometric tests conducted. Despite this, one could argue that dollarised countries exhibited a pattern of higher real investment growth

during the global financial crisis. Contrary to trends observed during the recent pandemic, during the 2008-2009 financial crisis, dollarised economies recorded positive growth rates in their current account balances compared to their non-dollarised counterparts. While these findings aren't particularly robust and require careful interpretation, they hint at a potential resilience of dollarised economies during the pronounced global financial downturn.

7 Conclusion

The objective of this study is to contribute to the literature by examining the impact of dollarisation on the real economy. We analysed over two decades of dollarisation in several emerging economies. This longer timeframe, encompassing multiple countries, offers a more comprehensive perspective than many existing studies. By evaluating this extended period, we can account for potential short-term economic fluctuations, yielding more unbiased results. This study utilises propensity score matching, drawing from a large sample of countries and observations.

Our findings show that the outcomes for dollarised countries differ across several indicators compared to non-dollarised counterparts. Over two decades, dollarised countries have enjoyed higher real growth levels in investment and trade compared to their non-dollarised counterparts. The impact of dollarisation on investment and trade is especially pronounced. We find that the trade-fostering effect of dollarised countries is driven by substantially higher growth levels in import and export. However, we also find that output volatility has been higher and current account balance growth more negative among dollarised countries for the past decade. At the same time, we conclude that dollarisation is not associated with faster or slower economic growth compared to other regimes. Such findings contradict a significant portion of the existing theoretical and empirical literature where dollarised countries are expected to have higher economic growth rates compared to non-dollarised regimes.

We further assess the performance of dollarised countries in comparison to other exchange rate regimes, individually. Dollarised countries consistently exhibit notably higher real growth rates in investment, trade, import, and export compared to their counterparts with soft peg, residual, and floating regimes. However, dollarised countries perform differently when compared to currency

board and currency union regimes. Though all are considered fixed exchange rate regimes, there are clear distinctions among them. Dollarised economies do not exhibit the same benefits in investment, trade, import, and export when compared to currency union countries. Furthermore, countries with currency board arrangements have higher trade and export levels than dollarised ones, challenging the perceived advantages of dollarisation. Finally, dollarised countries exhibit more output volatility and negative trends in current account balances compared to the other two fixed regimes.

7.1. Policy Implications

Empirical findings offer robust results with significant policy implications and also bring up new questions on the topic. The finding that dollarisation is associated with a similar output growth level compared to other forms of exchange rate regime is meaningful, particularly in questioning whether dollarisation is worth embarking on. According to our findings, dollarised countries not only fail to enjoy higher output growth rates - as suggested by proponents of dollarisation - but they have also experienced greater output growth volatility. The latter is especially intriguing. While not consistently significant across all periods, the trend that dollarised countries exhibit higher output volatility contradicts theoretical expectations. In theory, dollarisation should enhance macroeconomic stability through deeper financial integration, reduced financial crisis incidences, and improved fiscal discipline.

Our findings reveal a positive correlation between dollarisation and both trade and investment, implying that removing currency exchange risks positively impacts trade and capital inflows. This is consistent with the literature and the effects are rather substantive. Dollarisation appears to correlate with higher investment levels, showing an increase of around three percentage points. In comparison to the mean of the non-dollarised sample, this translates to a higher investment real growth rate of 2.5-3.9 percentage points annually over the last two decades. Notably, this increase in investment has been even more pronounced in the most recent decade. Whether the superior performance of dollarised countries on investment is attributed to lower interest rates could be a topic for further research. Further research is also required to investigate

why the additional level of investment has not translated into higher growth rates for dollarised countries.

Another policy implication pertains to the current account balance outcomes in dollarised countries. Overall, dollarised countries seem to exhibit significantly more negative growth in their current account balances compared to countries with other exchange rate arrangements. This discrepancy could potentially be attributed to the import dependency of these countries. Further investigation is required to explain the factors determining this discrepancy in current account balance growth.

7.2. Research Limitations

This paper focuses on evaluating empirical evidence from dollarisation. While it offers robust and comprehensive results on several outcomes of dollarisation, it does not examine the insight into the causal links between dollarisation and specific outcomes, such as higher output volatility. Exploring these causal links in-depth lies outside the scope of this study.

A significant challenge in evaluating non-random observational studies is the choice of methodology. No single methodology is universally ideal for these assessments. While this study employs matching estimation methods to determine the average treatment effect on the treated—a robust and increasingly popular approach for such studies—potential biases are inherent. We've employed several testing techniques to mitigate these biases, and our results are interpreted with these limitations in mind. Recently, methodologies like the synthetic control method have gained traction. However, this method was not feasible for our study due to insufficient pre-dollarisation data for many countries.

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Appendix 1. Detailed Results from Econometric Tests

1 Evaluation of dollarised vs. non-dollarised countries

Regression Matching Estimators								
	2000-2021 period (22 years)		2000-2019 period (20 years – excluding the COVID-19 pandemic)		2012-2021 period (the last 10 years) 1st specification		2012-2021 period (the last 10 years) 2nd specification	
Covariates	z	P>|z|	z	P>|z|	z	P>|z|	z	P>|z|
gdppc ppp	1.94	0.052	1.96	0.050	1.77	0.076	0.20	0.838
lnpop	-3.11	0.002	0.56	0.576	-3.01	0.003	-4.28	0.000
trade	-2.69	0.007	2.46	0.014	-2.67	0.008	-3.06	0.002
cab	-3.63	0.000	-4.31	0.000	-3.00	0.003	-3.28	0.001
busind	3.26	0.001	0.3	0.762	3.28	0.001	3.93	0.000
regqual	-4.18	0.000	-2.23	0.026	-4.02	0.000	-4.30	0.000
region	4.83	0.000	5.3	0.000	4.25	0.000	5.34	0.000

Evaluation of Outcome – Real GDP Growth: Dollarised vs. Non-Dollarised												
Evaluation technique	Real GDP Growth 2000-2021 period			Real GDP Growth 2000-2019 period			Real GDP Growth 2000-2019 period 1st specification			Real GDP Growth 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	-1.32	0.93	-1.42	0.80	0.67	1.20	-1.71	1.17	-1.47	-0.27	0.88	-0.30
NN-1	-1.19	0.96	-1.23	2.56	1.19	2.16**[27]	-2.36	1.52	-1.55	1.06	1.28	0.82
NN-3	-1.07	0.97	-1.11	1.77	0.82	2.15**	-2.17	1.23	-1.76*	-0.14	1.06	-0.13
NN-5	-0.71	0.95	-0.75	1.59	0.84	1.90*	-1.26	1.16	-1.09	-0.08	0.98	-0.08
R-0.002	0.00	0.94	0.00	1.50	1.10	1.36	-1.81	1.29	-1.40	0.64	1.28	0.50
R-0.02	-0.28	0.87	-0.32	2.03	0.82	2.46**	-1.05	0.99	-1.06	-0.05	0.98	-0.05
R-0.2	-1.13	0.88	-1.29	0.65	0.65	1.00	-1.14	1.07	-1.06	-0.70	0.85	-0.82
Bootstrap[28]	0.28	1.31	0.21	0.62	1.04	0.59	-0.05	1.57	-0.03	-0.20	1.25	-0.16

[27] Statistical significance is reported as following: * represents a 10% significance level, ** represents and 5% significance, and *** represents a 1% significance level.

[28] In Bootstrap the corresponding values of significance tests refer to z-values instead of t-stat

Evaluation of Outcome – Real GDP Growth Volatility: Dollarised vs. Non-Dollarised												
Evaluation technique	Growth Volatility 2000-2021 period			Growth Volatility 2000-2019 period			Growth Volatility 2000-2019 period 1st specification			Growth Volatility 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	0.51	0.32	1.59	0.21	0.43	0.49	0.85	0.36	2.35**	1.17	0.27	4.36***
NN-1	0.59	0.41	1.45	-0.48	0.86	-0.56	1.06	0.62	1.72*	0.64	0.36	1.76*
NN-3	0.56	0.31	1.78*	0.24	0.59	0.40	1.04	0.41	2.52**	1.03	0.33	3.14***
NN-5	0.53	0.30	1.74*	0.26	0.53	0.49	1.04	0.37	2.82***	0.90	0.30	2.96***
R-0.002	-0.07	0.16	-0.42	0.19	0.72	0.27	0.93	0.31	3.00***	0.75	0.38	1.99**
R-0.02	-0.05	0.11	-0.49	0.36	0.52	0.69	0.81	0.24	3.36***	1.22	0.30	4.05***
R-0.2	0.48	0.29	1.63	0.10	0.42	0.23	1.04	0.32	3.23***	1.26	0.25	4.98***
Bootstrap	0.71	0.43	1.66*	0.07	0.62	0.11	1.66	0.71	2.34**	2.20	0.46	4.82***

Evaluation of Outcome – Real Investment Growth Rate: Dollarised vs. Non-Dollarised												
Evaluation technique	Investment 2000-2021 period			Investment 2000-2019 period			Investment 2000-2019 period 1st specification			Investment 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	2.46	0.69	3.57***	2.03	0.68	2.97***	5.38	1.24	4.34***	4.83	0.69	6.99***
NN-1	2.61	1.30	2.00**	5.83	4.46	1.31	4.46	2.72	1.64	8.44	1.94	4.35***
NN-3	3.10	0.89	3.49***	4.66	2.58	1.80*	4.93	1.76	2.79***	6.48	1.38	4.69***
NN-5	3.92	0.82	4.76***	4.30	2.18	1.97**	7.12	1.66	4.30***	5.43	1.09	4.97***
R-0.002	3.62	0.76	4.77***	3.08	2.23	1.38	5.67	2.06	2.75***	6.48	1.84	3.52***
R-0.02	3.20	0.48	6.69***	3.12	1.35	2.32**	5.10	1.06	4.80***	5.17	1.06	4.89***
R-0.2	2.59	0.57	4.59***	1.60	0.60	2.66***	6.01	0.94	6.41***	4.30	0.56	7.74***
Bootstrap	-0.02	2.36	-0.01	0.09	2.83	0.03	2.10	2.90	0.72	-1.33	1.72	-0.77

Evaluation of Outcome – Real Trade Growth: Dollarised vs. Non-Dollarised

Evaluation technique	Trade 2000-2021 period			Trade 2000-2019 period			Trade 2000-2019 period 1st specification			Trade 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	2.98	0.66	4.53***	0.54	0.74	0.74	5.40	1.00	5.38***	5.11	0.61	8.31***
NN-1	2.67	1.38	1.93**	5.43	1.37	3.97***	5.13	2.40	2.14**	8.44	1.96	4.31***
NN-3	3.07	0.94	3.27***	3.72	1.09	3.40***	5.19	1.55	3.35***	6.65	1.33	5.01***
NN-5	3.66	0.88	4.17***	3.23	0.97	3.35***	6.86	1.49	4.59***	5.78	1.04	5.56***
R-0.002	2.41	0.76	3.19***	1.87	1.05	1.78*	5.84	1.79	3.26***	6.45	1.74	3.70***
R-0.02	2.22	0.46	4.84***	2.02	0.98	2.05**	4.96	0.75	6.60***	5.14	0.94	5.48***
R-0.2	3.06	0.54	5.64***	-0.02	0.71	-0.02	5.68	0.71	8.00***	4.59	0.49	9.46***
Bootstrap	0.26	1.22	0.21	-0.70	1.17	-0.59	1.18	2.08	0.56	1.90	1.99	0.95

Evaluation of Outcome – Real Import Growth: Dollarised vs. Non-Dollarised

Evaluation technique	Import 2000-2021 period			Import 2000-2019 period			Import 2000-2019 period 1st specification			Import 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	3.18	0.61	5.19***	0.38	0.69	0.56	4.45	1.00	4.45***	4.57	0.60	7.64***
NN-1	3.06	1.32	2.32**	5.35	1.25	4.29***	3.92	2.49	1.57	8.50	1.92	4.42***
NN-3	3.34	0.87	3.86***	3.83	1.01	3.79***	4.14	1.57	2.64***	6.38	1.33	4.81***
NN-5	3.98	0.81	4.91***	3.33	0.88	3.77***	6.15	1.49	4.13***	5.49	1.03	5.34***
R-0.002	3.30	0.72	4.58***	2.16	0.94	2.31**	5.41	1.76	3.07***	6.42	1.74	3.70***
R-0.02	3.03	0.43	7.01***	2.09	0.92	2.27**	4.76	0.75	6.37***	4.90	0.92	5.33***
R-0.2	3.25	0.50	6.57***	-0.24	0.66	-0.36	4.95	0.72	6.91***	3.95	0.47	8.46***
Bootstrap	3.09	1.64	1.89*	-0.70	1.24	-0.56	3.48	3.44	1.01	6.86	2.02	3.40***

Evaluation of Outcome – Real Export Growth: Dollarised vs. Non-Dollarised

Evaluation technique	Export 2000-2021 period			Export 2000-2019 period			Export 2000-2019 period 1st specification			Export 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	3.83	0.78	4.89***	0.31	0.73	0.42	7.52	1.13	6.66***	6.99	0.80	8.71***
NN-1	3.48	1.58	2.20**	5.35	1.64	3.27***	7.75	2.44	3.17***	9.63	2.06	4.66***
NN-3	3.86	1.07	3.59***	3.26	1.23	2.65***	7.67	1.64	4.68***	8.27	1.42	5.82***
NN-5	4.36	1.00	4.37***	2.63	1.06	2.47**	8.86	1.57	5.63***	7.46	1.17	6.39***
R-0.002	2.13	0.82	2.60***	1.06	1.15	0.92	6.30	1.86	3.38***	7.44	1.88	3.96***
R-0.02	2.03	0.50	4.02***	1.61	1.02	1.58	5.35	0.83	6.48***	6.61	1.10	6.03***
R-0.2	3.85	0.67	5.73***	-0.26	0.69	-0.38	7.49	0.83	9.00***	6.58	0.69	9.49***
Bootstrap	3.36	1.76	1.91*	-1.83	1.48	-1.23	6.22	2.46	2.53**	8.42	1.94	4.34***

Evaluation of Outcome –Real Current Account Balance Growth: Dollarised vs. Non-Dollarised												
Evaluation technique	Current Account Balance 2000-2021 period			Current Account Balance 2000-2019 period			Current Account Balance 2000-2019 period 1st specification			Current Account Balance 2012-2021 period 2nd specification		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	-91.10	22.38	-4.07***	23.54	11.30	2.08**	-158.16	40.37	-3.92***	-133.88	29.20	-4.58***
NN-1	-108.30	52.50	-2.06**	12.78	10.34	1.24	-148.08	63.53	-2.33**	-154.28	42.91	-3.60***
NN-3	-88.05	29.33	-3.00***	17.28	10.77	1.61	-147.32	53.09	-2.78***	-158.66	35.10	-4.52***
NN-5	-82.77	26.58	-3.11***	21.95	9.34	2.35**	-148.23	47.45	-3.12***	-142.39	34.62	-4.11***
R-0.002	-113.17	27.76	-4.08***	24.00	13.09	1.83*	-170.81	55.26	-3.09***	-137.68	59.33	-2.32**
R-0.02	-96.01	21.58	-4.45***	35.59	14.82	2.40**	-191.91	36.84	-5.21***	-153.55	36.33	-4.23***
R-0.2	-93.21	20.14	-4.63***	20.60	9.57	2.15**	-153.72	35.64	-4.31***	-114.88	27.68	-4.15***
Bootstrap	-55.00	29.57	-1.86*	23.91	24.62	0.97	-107.03	41.16	-2.60***	-95.10	45.01	-2.11**

2 Evaluation of dollarised vs. currency board arrangement countries for the 2000-2021 period

Evaluation of Outcome (2020-2021): Dollarised vs. Currency Board Arrangements		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
gdppc ppp	-2.70	0.007
lnpop	-2.28	0.022
trade	-2.33	0.020
busind	1.81	0.071
regqual	-2.72	0.007

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	-0.40	1.77	-0.22	0.94	0.91	1.02	1.00	1.24	0.81
NN-1	-0.17	1.34	-0.13	0.94	0.25	3.78***	1.00	0.25	4.00***
NN-3	-0.76	1.25	-0.61	0.94	0.25	3.78***	1.00	0.25	4.00***
NN-5	-0.93	1.19	-0.78	0.94	0.25	3.78***	1.00	0.25	4.00***
R-0.002	-6.46	NA	NA	2.92	NA	NA	3.00	NA	NA
R-0.02	-0.39	1.60	-0.24	1.17	0.37	3.19***	1.24	0.37	3.35***
R-0.2	-0.68	1.24	-0.55	0.94	0.25	3.78***	1.00	0.25	4.00***
Bootstrap	5.31	2.17	2.45**	1.84	0.39	4.66***	2.61	3.21	0.81

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	-2.00	1.14	-1.75*	0.67	1.01	0.66	-4.33	1.65	-2.63***	-90.67	20.12	-4.51***
NN-1	-2.00	0.25	-8.00***	0.67	0.17	4.00***	-4.33	0.42	-10.40***	-90.67	15.66	-5.79***
NN-3	-2.00	0.25	-8.00***	0.67	0.17	4.00***	-4.33	0.42	-10.40***	-90.67	15.66	-5.79***
NN-5	-2.00	0.25	-8.00***	0.67	0.17	4.00***	-4.33	0.42	-10.40***	-90.67	15.66	-5.79***
R-0.002	0.00	NA	NA	2.00	NA	NA	-1.00	NA	NA	-10.00	NA	NA
R-0.02	-1.76	0.37	-4.78***	0.82	0.25	3.35***	-3.94	0.62	-6.41***	-81.18	21.79	-3.72***
R-0.2	-2.00	0.25	-8.00***	0.67	0.17	4.00***	-4.33	0.42	-10.40***	-90.67	15.66	-5.79***
Bootstrap	-1.33	0.77	-1.72	0.67	0.14	4.82***	-4.33	0.39	-11.06***	-36.03	13.64	-2.64***

3 Evaluation of dollarised vs. soft peg arrangement countries for the 2000-2021 period

Evaluation of Outcome (2020-2021): Dollarised vs. Soft Pegs		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
gdppc ppp	1.49	0.135
lnpop	-3.10	0.002
trade	-0.07	0.945
busind	2.32	0.021
regqual	-2.44	0.015

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	-0.99	0.81	-1.22	0.64	0.27	2.38**	2.80	0.37	7.56***
NN-1	-0.13	1.68	-0.08	0.68	0.60	1.14	3.67	1.19	3.09***
NN-3	-0.54	1.07	-0.51	0.69	0.39	1.75*	2.69	0.71	3.76***
NN-5	-0.86	0.95	-0.90	0.69	0.35	1.98**	2.75	0.64	4.27***
R-0.002	-0.83	0.91	-0.91	-0.49	0.29	-1.70*	2.32	0.58	4.03***
R-0.02	-0.15	0.76	-0.20	0.36	0.31	1.17	2.52	0.58	4.39***
R-0.2	-1.15	0.80	-1.42	0.59	0.27	2.22**	2.86	0.35	8.12***
Bootstrap	-0.10	1.05	-0.09	0.80	1.12	0.72	2.77	1.26	2.20**

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	2.22	0.38	5.82***	2.46	0.32	7.77***	2.92	0.54	5.45***	-112.40	17.56	-6.40***
NN-1	2.94	1.29	2.29**	2.76	1.21	2.28**	4.00	1.50	2.67***	-142.61	42.29	-3.37***
NN-3	1.98	0.72	2.73***	2.04	0.63	3.24***	2.62	0.95	2.76***	-146.51	26.85	-5.46***
NN-5	1.80	0.65	2.77***	1.98	0.57	3.49***	2.24	0.84	2.68***	-149.83	24.21	-6.19***
R-0.002	1.44	0.58	2.48**	1.95	0.52	3.75***	1.34	0.76	1.76*	-153.68	24.36	-6.31***
R-0.02	1.42	0.59	2.39**	1.78	0.53	3.35***	1.67	0.75	2.22**	-152.87	22.09	-6.92***
R-0.2	2.32	0.36	6.42***	2.60	0.30	8.80***	3.00	0.52	5.82***	-107.15	17.24	-6.21***
Bootstrap	1.79	1.18	1.52	1.36	1.46	0.93	1.24	1.95	0.64	-70.23	33.00	-2.13**

4 Evaluation of dollarised vs. residual arrangement countries for the 2000-2021 period

Evaluation of Outcome (2020-2021): Dollarised vs. Residual		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
gdppc ppp	3.17	0.002
lnpop	-4.10	0.000
trade	-3.91	0.000
busind	3.29	0.001
regqual	-3.05	0.002

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	1.39	1.31	1.07	-0.37	0.53	-0.70	6.80	1.44	4.73***
NN-1	0.30	1.33	0.23	-0.04	0.44	-0.08	5.21	1.98	2.63***
NN-3	0.13	1.36	0.09	0.11	0.37	0.29	4.98	1.76	2.83***
NN-5	0.56	1.19	0.47	0.09	0.39	0.23	4.17	1.53	2.72***
R-0.002	-5.61	2.29	-2.45**	-0.62	0.16	-3.82***	-1.80	2.48	-0.73
R-0.02	-0.13	1.22	-0.11	-0.31	0.46	-0.67	4.49	1.58	2.85***
R-0.2	1.12	1.26	0.89	-0.38	0.50	-0.75	6.55	1.35	4.83***
Bootstrap	-0.27	1.80	-0.15	-0.11	0.72	-0.16	2.64	2.33	1.13

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	8.56	1.22	7.00***	8.21	1.14	7.20***	9.92	1.39	5.90***	-51.98	27.74	-1.87*
NN-1	8.64	1.44	5.99***	8.27	1.34	6.19***	10.12	1.71	5.99***	-62.36	29.59	-2.11**
NN-3	6.88	1.18	5.81***	6.72	1.10	6.10***	7.82	1.31	6.53***	-57.69	29.04	-1.99**
NN-5	6.04	1.00	6.03***	5.77	0.92	6.30***	7.48	1.15	1.43	-49.41	25.76	-1.92*
R-0.002	3.00	1.64	1.83*	3.00	1.10	2.74***	4.20	2.94	6.14***	-107.60	44.88	-2.40**
R-0.02	6.97	1.11	6.27***	6.76	1.02	6.65***	7.98	1.30	7.27***	-61.60	29.07	-2.12**
R-0.2	8.23	1.15	7.13***	7.94	1.07	7.40***	9.56	1.32	3.06***	-53.06	26.61	-1.99**
Bootstrap	2.82	1.60	1.76*	8.27	2.76	3.00***	10.12	3.31	6.40***	-14.49	46.02	-0.31

5 Evaluation of dollarised vs. floating arrangement countries for the 2000-2021 period

Evaluation of Outcome (2020-2021): Dollarised vs. Floating		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
gdppc ppp	3.49	0.000
lnpop	-4.83	0.000
trade	-2.20	0.028
busind	1.39	0.165
regqual	-5.66	0.000

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	-1.01	1.87	-0.54	-0.58	0.65	-0.88	7.65	1.84	4.16***
NN-1	-0.82	1.85	-0.44	-1.05	0.83	-1.27	7.55	3.61	2.09**
NN-3	-0.77	1.66	-0.46	-0.38	0.67	-0.57	2.26	2.28	0.99
NN-5	-0.32	1.40	-0.23	-0.30	0.54	-0.55	4.69	1.73	2.72***
R-0.002	-1.09	1.51	-0.72	-1.32	0.44	-3.03***	0.31	1.28	0.24
R-0.02	-1.46	1.66	-0.88	-0.79	0.50	-1.60	5.27	1.18	4.45***
R-0.2	-0.71	1.54	-0.46	-0.27	0.54	-0.50	6.23	1.45	4.28***
Bootstrap	-5.62	4.45	-1.26	0.12	0.50	0.23	5.05	2.49	2.03**

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	10.17	1.83	5.56***	10.06	1.79	5.63***	11.33	2.00	5.65***	-30.93	50.87	-0.61
NN-1	10.03	3.75	2.67***	9.88	3.57	2.77***	11.15	3.99	2.79***	-41.79	54.66	-0.76
NN-3	7.54	2.01	3.75***	7.29	1.90	3.84***	9.27	2.23	4.16***	5.33	33.04	0.16
NN-5	8.44	1.53	5.51***	8.42	1.44	5.85***	9.90	1.74	5.70***	42.96	28.67	1.50
R-0.002	-0.81	1.30	-0.62	0.31	1.23	0.25	-1.27	1.41	-0.90	-44.38	7.15	-6.20***
R-0.02	6.89	1.16	5.93***	7.19	1.13	6.37***	7.57	1.31	5.76***	-33.51	36.42	-0.92
R-0.2	9.15	1.45	6.33***	9.06	1.41	6.43***	10.44	1.60	6.54***	-5.52	41.13	-0.13
Bootstrap	3.95	1.99	1.99**	9.88	2.69	3.67***	11.15	2.21	5.05***	-6.95	32.44	-0.21

6 Evaluation of dollarised vs. currency union countries for the 2000-2021 period

Evaluation of Outcome (2020-2021): Dollarised vs. Currency Union		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
gdppc ppp	2.88	0.004
lnpop	-3.62	0.000
trade	-3.71	0.000
busind	3.83	0.000
regqual	-3.01	0.003

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	0.91	2.54	0.36	1.20	1.33	0.90	-3.64	2.44	-1.49
NN-1	2.73	6.47	0.42	1.11	0.49	2.26**	-3.45	4.07	-0.85
NN-3	2.69	3.44	0.78	0.97	0.41	2.37**	-0.03	2.72	-0.01
NN-5	0.33	2.93	0.11	1.06	0.37	2.85***	-0.35	2.29	-0.15
R-0.002	-1.15	NA	NA	0.44	NA	NA	-8.00	NA	NA
R-0.02	-1.95	6.22	-0.31	2.03	0.66	3.09***	-4.68	4.47	-1.05
R-0.2	-0.29	4.24	-0.07	1.24	0.48	2.59***	-3.83	3.39	-1.13
Bootstrap	0.78	1.49	0.52	1.06	0.28	3.82***	0.74	1.24	0.60

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	-1.07	1.67	-0.64	-1.88	1.85	-1.01	1.27	1.90	0.67	-89.83	26.80	-3.35***
NN-1	-0.94	2.35	-0.40	-1.91	3.05	-0.63	1.64	2.15	0.76	-86.33	22.27	-3.88***
NN-3	0.98	1.58	0.62	1.00	2.01	0.50	2.62	1.62	1.62	-82.14	19.99	-4.11***
NN-5	0.78	1.34	0.58	0.90	1.69	0.53	2.25	1.38	1.63	-85.43	18.83	-4.54***
R-0.002	-4.00	NA	NA	-5.00	NA	NA	-2.00	NA	NA	-58.00	NA	NA
R-0.02	-1.36	2.61	-0.52	-2.71	3.20	-0.85	1.68	2.60	0.65	-42.39	23.92	-1.77*
R-0.2	-1.19	1.96	-0.60	-1.95	2.55	-0.77	1.07	1.99	0.54	-91.58	22.16	-4.13***
Bootstrap	0.61	1.01	0.60	-1.42	2.77	-0.51	1.76	2.00	0.88	40.93	32.77	1.25

7 Evaluation of dollarised vs. non-dollarised countries for the period 2020-2021 – the COVID-19 pandemic

Evaluation of Outcome (2020-2021): Dollarised vs. Non-Dollarised		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
lnpop	-2.74	0.006
region	2.32	0.020

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	1.03	3.42	0.30	4.32	2.08	2.07**	-6.01	6.44	-0.93
NN-1	3.73	5.05	0.74	6.62	3.06	2.16**	-15.50	7.07	-2.19**
NN-3	2.10	4.54	0.46	3.93	3.48	1.13	-12.44	7.12	-1.75*
NN-5	1.33	4.15	0.32	3.26	3.11	1.05	-12.17	6.88	-1.77*
R-0.002	0.06	5.93	0.01	-1.67	4.95	-0.34	-7.83	9.01	-0.87
R-0.02	1.16	3.86	0.30	4.51	2.75	1.64	-6.40	7.89	-0.81
R-0.2	0.72	3.39	0.21	5.48	2.06	2.67***	-5.28	6.37	-0.83
Bootstrap	-0.74	7.44	-0.10	8.38	3.93	2.13**	-11.17	8.27	-1.35

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	27.08	14.93	1.81*	18.92	12.36	1.53	42.76	20.61	2.08**	-394.57	204.71	-1.93*
NN-1	22.67	15.66	1.45	12.50	12.70	0.98	41.17	21.77	1.89*	-166.50	454.18	-0.37
NN-3	24.44	15.48	1.58	15.06	12.86	1.17	41.94	21.18	1.98**	-260.89	272.70	-0.96
NN-5	24.10	15.29	1.58	15.27	12.70	1.20	40.80	20.95	1.95*	-350.20	233.51	-1.50
R-0.002	45.42	26.42	1.72*	35.43	20.03	1.77*	64.95	38.82	1.67*	-955.13	315.84	-3.02***
R-0.02	28.15	17.90	1.57	19.54	14.80	1.32	43.72	24.90	1.76*	-560.86	232.99	-2.41**
R-0.2	26.73	14.91	1.79*	19.04	12.34	1.54	41.81	20.59	2.03**	-426.32	203.98	-2.09**
Bootstrap	22.00	15.60	1.41	13.83	13.98	0.99	37.17	28.45	1.31	-488.00	305.53	-1.60

8 Evaluation of dollarised vs. non-dollarised countries for the 2008-2009 period – the global financial crisis

Evaluation of Outcome (2008-2009): Dollarised vs. Non-Dollarised		
Probit Regression Matching Estimator		
Covariates	z	P>|z|
lnpop	-2.29	0.022
region	2.20	0.028

Evaluation technique	Real GDP Growth			Growth Volatility			Investment		
	Difference	S.E.	T-stat	Difference	S.E.	T-stat	Difference	S.E.	T-stat
Kernel	1.29	1.85	0.69	1.32	0.97	1.36	15.28	11.16	1.37
NN-1	1.69	2.47	0.68	1.26	1.26	1.00	20.20	12.56	1.61
NN-3	2.92	2.09	1.40	0.75	1.06	0.71	21.20	11.49	1.85*
NN-5	1.91	2.01	0.95	0.78	1.04	0.76	19.88	11.40	1.74*
R-0.002	2.56	2.52	1.02	-1.40	0.92	-1.53	31.20	18.10	1.72*
R-0.02	2.59	1.89	1.38	0.05	0.78	0.06	20.89	13.67	1.53
R-0.2	0.96	1.85	0.52	1.45	0.97	1.50	14.50	11.16	1.30
Bootstrap	1.77	2.63	0.67	-0.36	2.36	-0.15	19.69	11.45	1.72*

Evaluation technique	Trade			Import			Export			Current Account Balance		
	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat	Diff	S.E.	T-stat
Kernel	5.10	3.82	1.34	3.45	4.00	0.86	3.48	2.02	1.72*	15.28	11.16	1.37
NN-1	5.60	5.48	1.02	4.20	6.06	0.69	3.80	4.23	0.90	20.20	12.56	1.61
NN-3	6.33	4.18	1.52	5.93	4.50	1.32	3.27	2.54	1.29	21.20	11.49	1.85*
NN-5	6.12	4.05	1.51	5.88	4.37	1.34	2.84	2.36	1.20	19.88	11.40	1.74*
R-0.002	7.70	6.24	1.23	7.27	6.83	1.06	2.60	2.38	1.09	31.20	18.10	1.72*
R-0.02	7.67	4.50	1.70*	6.05	4.74	1.28	5.70	2.17	2.62***	20.89	13.67	1.53
R-0.2	4.92	3.81	1.29	3.24	3.99	0.81	3.32	2.01	1.65*	14.50	11.16	1.30
Bootstrap	4.31	4.41	0.98	2.00	4.07	0.49	3.54	4.03	0.88	19.69	11.45	1.72*

Appendix 2. List of Countries Examined

Nr.	Country	Nr.	Country	Nr.	Country	Nr.	Country	Nr.	Country
1	Afghanistan	29	Comoros	57	Iraq	85	Malawi	113	Somalia
2	Angola	30	Cabo Verde	58	Jamaica	86	Malaysia	114	Serbia
3	Albania	31	Costa Rica	59	Jordan	87	Namibia	115	South Sudan
4	United Arab Emirates	32	Cuba	60	Kazakhstan	88	Niger	116	Suriname
5	Argentina	33	Djibouti	61	Kenya	89	Nigeria	117	Eswatini
6	Armenia	34	Dominican Republic	62	Kyrgyz Republic	90	Nicaragua	118	Syrian Arab Republic
7	Azerbaijan	35	Algeria	63	Cambodia	91	Nepal	119	Chad
8	Burundi	36	Ecuador	64	Kuwait	92	Oman	120	Togo
9	Benin	37	Egypt, Arab Rep.	65	Lao PDR	93	Pakistan	121	Thailand
10	Burkina Faso	38	Eritrea	66	Lebanon	94	Panama	122	Tajikistan
11	Bangladesh	39	Ethiopia	67	Liberia	95	Peru	123	Turkmenistan
12	Bulgaria	40	Fiji	68	Libya	96	Philippines	124	Timor-Leste
13	Bahrain	41	Gabon	69	Sri Lanka	97	Papua New Guinea	125	Trinidad and Tobago
14	Bosnia and Herzegovina	42	Georgia	70	Lesotho	98	Poland	126	Tunisia
15	Belarus	43	Ghana	71	Macao SAR, China	99	Puerto Rico	127	Turkey
16	Bolivia	44	Guinea	72	Morocco	100	Korea, Dem. People's Rep.	128	Tanzania
17	Brazil	45	Gambia, The	73	Moldova	101	Paraguay	129	Uganda
18	Brunei Darussalam	46	Guinea-Bissau	74	Madagascar	102	West Bank and Gaza	130	Ukraine
19	Bhutan	47	Equatorial Guinea	75	Maldives	103	Qatar	131	Uruguay
20	Botswana	48	Guatemala	76	Mexico	104	Romania	132	Uzbekistan
21	Central African Republic	49	Guyana	77	North Macedonia	105	Russian Federation	133	Venezuela, RB
22	Chile	50	Honduras	78	Mali	106	Rwanda	134	Vietnam
23	China	51	Croatia	79	Myanmar	107	Saudi Arabia	135	Kosovo
24	Cote d'Ivoire	52	Haiti	80	Montenegro	108	Sudan	136	Yemen, Rep.
25	Cameroon	53	Hungary	81	Mongolia	109	Senegal	137	South Africa
26	Congo, Dem. Rep.	54	Indonesia	82	Mozambique	110	Solomon Islands	138	Zambia
27	Congo, Rep.	55	India	83	Mauritania	111	Sierra Leone	139	Zimbabwe
28	Colombia	56	Iran, Islamic Rep.	84	Mauritius	112	El Salvador		

Appendix 3. Variables and Sources

Variable name	Function	Variable	Definition	Source
Dollarisation	Independent variable	doll	Official dollarisation/de jure is where countries adopt a foreign currency as a legal tender.	The IMF's Annual Reports on Exchange Arrangements and Exchange Restrictions (AREAER) database
Currency exchange arrangement			Exchange rate arrangements of countries, including the de jure arrangements as described by the countries and the de facto arrangements. Categorisation into six categories by the author based on the IMF's ten categories. The six categories of exchange rate regimes are: Dollarisation, Currency Board, Soft Peg, Residual, Floating, and Currency Union.	
GDP per capita at purchasing power parity	Covariate	gdppc ppp	GDP per capita in current U.S. dollars is gross domestic product divided by population. The indicator is expressed in current international dollars converted by purchasing power parity conversion factor.	World Bank, World Development Indicators
Logarithmic function of population number	Covariate	lnpop	Logarithmic function calculated by the author based on the total population number.	
Trade as a percentage of GDP	Covariate	trade	The sum of exports and imports of goods and services as a percentage of GDP.	
Current account balance as a percentage of GDP	Covariate	cab	The sum of net exports of goods and services, net primary income, and net secondary income as a percentage of GDP.	
Ease of doing business score	Covariate	busind	The ease of doing business score is one of the Doing Businesses indicators, which presents a simple average of the scores for each of the Doing Business topics: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency.	World Bank, Doing Business project
Regulatory quality	Covariate	regqual	Regulatory Quality metric is obtained from The Worldwide Governance Indicators (WGI). It presents perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	The Worldwide Governance Indicators, World Bank Policy Research
Geographic region	Covariate	region	Countries have been assigned in one of the five regions: Asia, Africa, Europe, Americas, and Oceania	
Real rate of GDP growth	Dependent variable		Annual percentage growth rate of GDP at market prices based on constant local currency.	World Bank, World Development Indicators
GDP growth volatility	Dependent variable		Growth volatility has been calculated by the author as the standard deviation of real GDP growth rates for the examined period.	
Real rate of investment growth	Dependent variable		The real rate of growth was computed by the author by dividing the annual nominal growth rates by the annual inflation rates, based on the CPI. Investment is defined as gross capital formation, which includes outlays on additions to the economy's fixed assets as well as net changes in the level of inventories.	
Real rate of trade growth	Dependent variable		The real rate of growth was computed by the author by dividing the annual nominal growth rates by the annual inflation rates, based on the CPI. Trade is the sum of exports and imports of goods and services.	
Real rate of import growth	Dependent variable		The real rate of growth was computed by the author by dividing the annual nominal growth rates by the annual inflation rates, based on the CPI. Imports of goods and services represent the value of all goods and other market services received from the rest of the	

		world.
Real rate of export growth	Dependent variable	The real rate of growth was computed by the author by dividing the annual nominal growth rates by the annual inflation rates, based on the CPI. Exports of goods and services represent the value of all goods and other market services provided to the rest of the world.
Nominal rate of current account balance growth	Dependent variable	The nominal growth was computed by dividing the value of the current account balance by the value from the previous year. Current account balance is the sum of net exports of goods and services, net primary income, and net secondary income.

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