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Strict Dollarization and Economic Performance Revisited

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Abstract

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We revisit the historical record of the economic performance of strictly dollarized economies relative to that economies of non-dollarized economies as previously examined by Edwards (2001) and Edwards and Magendzo (2003, 2006). We extend their work to take advantage of the experience of more recently dollarized economies, employ a larger country sample and a longer sample period, use panel as opposed to cross-section data, and employ a variety of econometric techniques, including to deal with potential endogeneity problems. Our results suggest that overall countries that adopted dollarization experienced higher average GDP growth rates and lower inflation rates and inflation volatility than countries that did not adopt dollarization. Moreover, even GDP growth appears to have been less volatile in dollarized countries in recent years.

JEL codes: E30, E31, F43, O11

Keywords: Strict dollarization, GDP growth, inflation, volatility

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Strict Dollarization and Economic Performance Revisited

1 Introduction

The idea of dollarization as an official regime choice has been a topic of interest during the last 25 years.³ *De jure* unilateral dollarization had gained popularity amongst academics and policy makers after Ecuador and El Salvador adopted the U.S. dollar as legal tender.⁴ However, following the demise of the Argentinean currency board at the end of 2001 and its political and economic aftermath, enthusiasm for super-fixed exchange rate regimes, including dollarization, declined. More recently, strict dollarization has been back in the headlines recently with the policy being a key element of the policy platform of Argentina's President Javier Milei, who was elected to office in November 2023.

The literature on dollarization has primarily focused on its costs and benefits (see, for example, Alesina and Barro (2001), Berg and Borensztein (2003), Levy-Yeyati and Sturzenegger (2003), and Panizza et al. (2003)), and how these might impact on economic performance. Conventional wisdom typically identifies the costs as: a loss of seigniorage; a limited or no ability to provide lender-of-last-resort assistance to troubled banks; the lack of an exchange rate to be used as a shock absorber; and the inability to reduce the value of financial commitments

³ By official dollarization, we mean a country's unilateral decision to adopt a foreign currency as a legal tender even if the currency adopted is other than the dollar. In our sample, the term dollarization includes unilateral adoption of the euro, the currencies of some European Union (EU) countries prior to those countries formal accession to the euro (i.e., the Dutch guilder, the French franc, the Italian lira), the Australian dollar, and the Danish krone. It excludes the formal accession to the euro area by EU member states as these countries preserve an influence over monetary policy as they are proportionately represented at the Board of the European Central Bank.

⁴ We define the term "legal tender" as the currency used in a country that, by law, may be offered in payment of a debt and that a creditor legally cannot refuse.

denominated in domestic currency via a large exchange rate depreciation or through fueling inflation. On the other hand, the benefits of officially adopting dollarization are viewed as: the convergence of domestic inflation towards world inflation; the elimination of currency risk, which reduces domestic interest rates; a better environment for investment as a result of stable inflation and lower interest rates; and an absence of the so-called “original sin,” which should reduce country risk as currency mismatches in the country’s balance sheet disappear.⁵ Not surprisingly, there has been substantial discussion around the balance of these pros and cons as they impact on economic performance, especially on GDP growth and inflation. For many years, a major limiting factor in this debate—at least for the proponents of dollarization—has been the absence of economies with a long track record of adopting a foreign currency as legal tender. Only Panama had such a record, but it is a small economy that for most of its history had been an economic dependency of the US and therefore not an ideal comparator. This has meant that the benefits of dollarization have been difficult to demonstrate. Moreover, most cross-country studies relating to economic performance under dollarization have focused on partially dollarized economies where the domestic currency has continued to circulate in parallel with a foreign currency, or on independent currency unions. These studies have included very few observations on strictly dollarized countries, where the national currency has been replaced by a foreign one as the sole legal tender. For example, in their recent meta-analysis of studies of economic performance under dollarization, Koráb et al. (2023) report that dollarized countries on average display slower and more volatile output growth, and a lower inflation rate than non-dollarized countries. However, of the 43 studies that they include, only the studies by Edwards (2001) and Edwards and Magendzo

⁵ The “original sin” refers to a situation in which countries are unable to issue debt in their own currency and, hence, obtain financing by issuing debt denominated in a major international currency. As a result, countries become vulnerable to large exchange rate depreciations as they may increase considerably government expenditures, casting doubts about the countries capacity to pay back the debt.

(2003, 2006) deal with the case of strict dollarization with the other studies focusing on the relative performance of partially dollarized economies, which may have significantly more room for maneuver with respect to monetary policy.⁶ This is unfortunate especially as we now have a more substantial dataset to re-evaluate the impact of strict dollarization on economic performance.

In this paper, we revisit the historical record of the economic performance of strictly dollarized economies relative to that of economies with other monetary arrangements. Edwards (2001) and Edwards and Magendzo (2003, 2006) report results that are not especially favorable to strict dollarization project. Employing a sample of annual average data over the period 1970-1998 for 148 countries and territories, of which 16 were dollarized, they find that strictly dollarized economies exhibit GDP per capita growth rates that not significantly different from rates in non-dollarized economies and GDP growth volatility that is significantly higher. We update and extend their work to take advantage of the experience of recently dollarized economies. In particular, we include the relative economic performance of the more recently dollarized economies of Ecuador, El Salvador, Kosovo, Montenegro, Timor Leste, and Zimbabwe. We employ an (unbalanced) data panel that covers the period 1980-2021 and includes 191 countries and territories, of which 22 are dollarized, and present results using a variety of econometric techniques, including to resolve issues of unobserved heterogeneity.

Our results are substantially more favorable to strict dollarization. We find that strictly dollarized economies have exhibited higher and, in recent years, more stable rates of growth of GDP per capita than have non-dollarized economies. The inflation performance of strictly

⁶ Koráb et al. (2003) list additional studies by Edwards and Magendzo as having been included in their meta-analysis, but these appear to be earlier working paper versions of the published papers.

dollarized economies has also been superior with these countries exhibiting lower annual rates of inflation and less inflation volatility. Our results are robust to changes in sample period, to employing a standard set of control variables, and to alternative estimation techniques to deal with endogeneity issues. Accordingly, while there may be many reasons for a country not to adopt strict dollarization, these likely do not include a deterioration in economic performance. To the contrary, relative economic performance may well improve if strict dollarization is adopted.

2. Strict dollarization 1980-2023

Countries that use a foreign convertible currency as legal tender can be divided into two groups: (a) independent nations; and (b) territories, colonies or regions within a national entity. Table 1 lists the countries and territories that were strictly dollarized during our sample period and that have annual data on inflation and GDP growth. Most of these economies are very small and many are city-states. In addition, in most cases, dollarization was adopted more for historical and political reasons than as a policy response to an evaluation of the pros and cons of alternative arrangements (Levy-Yeyati and Sturzenegger 2003). The exceptions are Ecuador, El Salvador, Kosovo, Montenegro, Timor Leste, and Zimbabwe who joined the strictly dollarized group in different years after 2000 and whose experiences and the way they arrived at the dollarization decision differed significantly.⁷

Ecuador and Zimbabwe resorted to dollarization as a way to cope with widespread political and financial crisis and high inflation rooted in a loss of credibility in their political and monetary

⁷ Jácome and Lönnberg (2010) provide a good discussion of the background to dollarization in these countries.

institutions. Dollarization in Kosovo, Montenegro and Timor-Leste followed periods of conflict related to national independence as well as economic crisis conditions. Kosovo and Montenegro adopted unofficial dollarization after the disintegration of Yugoslavia in the early 1990s when they were bound to Yugoslav monetary policy and used the Yugoslav dinar as their currency. High inflation and conflicts with Yugoslavia discredited the dinar and resulted in the use and hoarding of foreign currencies (mainly the German mark) with the euro eventually adopted as legal tender in 2002. In Timor-Leste, the decision to dollarize was in part a symbolic break from Indonesian rule but also reflected the reality of weak institutional capacity in the newly independent country. The initial decision was taken by the United Nations Transitional Administration in East Timor in 2000 as part of the transition to full independence from Indonesia; following the move to full independence in May 2002, the government of Timor-Leste decided to maintain the U.S. dollar as the official currency. Finally, El Salvador decided to adopt the US dollar as legal tender after years of an unofficial peg following an internal debate and in the context of stable macroeconomic conditions.

In Table 2 we provide data on some key variables for the strictly dollarized and non-dollarized countries in our sample. The annual average rates of growth of GDP per capita were broadly similar in dollarized and non-dollarized economies (1.48% and 1.92%, respectively), as were the volatilities of GDP growth (with standard deviations of 3.47 and 3.39, respectively). Inflation rates in the dollarized countries were much lower and less volatile than in non-dollarized countries on both measures of inflation. In addition, dollarized countries are substantially smaller (as measured by population), and much more open to foreign trade and capital flows. Variable definitions and data sources are given in the appendix.

3. Methodology

We present results from three alternative estimation methodologies to investigate the relative economic performance of strictly dollarized economies. These are panel least squares regressions and, to better deal with endogeneity issues, joint maximum likelihood estimates (MLE) and propensity score matching (PSM) techniques.

a. Panel regression

We begin by adopting an OLS estimation approach:

$$y_{i,t} = \alpha_0 + \beta_1 Post_t + \beta_2 Post_t * Dollarization + X_{i,t} + \gamma_i + \delta_t + \epsilon_{i,t} \quad (1)$$

where y_{it} denotes country economic performance, α_0 represents country performance in the control group prior to the treatment, $Post$ represents the year and is equal to one from the date that a country introduced dollarization and zero otherwise. *Dollarization* is a dummy variable that equals one for the countries that dollarized and zero otherwise. $X_{i,t}$ is a vector of country-specific characteristics, and γ_i and δ_t capture fixed country and time effects, respectively. β_1 captures any change in country performance following dollarization. β_2 captures the effect on economic performance of countries that adopted strict dollarization.

We employ six alternate measures of country economic performance: the annual rate of growth of real GDP per capita, the annual rate of inflation measured by the consumer price index and by the GDP deflator, and the volatilities of these three series as represented by a centered 5-year standard deviation of the annual rates of change. A positive and statistically significant coefficient for β_2 would indicate, *ceteris paribus*, that real GDP growth and its volatility, and inflation and its volatility were higher in countries that adopted dollarization. The variables in $X_{i,t}$ are typical of the dollarization literature and include: a country's income level, which we proxy by real GDP per capita; country size, which we proxy by total population; openness to capital flows, for which we employ the Chinn and Ito (2006) financial openness index; openness to international trade, which we measure by the ratio to GDP of exports plus imports; and a measure of exchange rate regime flexibility, for which we employ the exchange rate regime classification developed by Reinhart and Rogoff (2004) and updated by Ilzetzki et al. (2022).⁸

Equation (1) gives rise to an important econometric issue in evaluating the effect of dollarization when the decision to adopt it is not random. If dollarization adoption is systematically correlated with a set of variables that also affect the outcomes, then we will have the selection on variables problem, which makes linear regression with a dollarization adoption dummy an unreliable method.⁹ We address the potential simultaneity in the determination of GDP growth and inflation and their volatilities by also employing MLE and PSM methodologies.

b Joint maximum likelihood estimation

⁸ We employ the Reinhart and Rogoff (2004) coarse grid categorization of exchange rate regimes, which ranges from 1 (least flexible) to 5 (most flexible).

⁹ Dehejia and Wahba (2002) and Heckman et al. (1998) provide detailed discussions.

We apply MLE as in, for example, Boucekine et al. (2021). In this case, the model is composed of a system of two equations.

$$y_{i,t} = a_t + \theta_1 X_{it} + \theta_2 \text{Dollarization}_i + \lambda \zeta_t + \varepsilon_{it} \quad (2)$$

and

$$\text{Dollarization}_{it} = a_t + \delta_1 X_{it} + \delta_2 M_{it} + \zeta_t + \omega_{it} \quad (3)$$

where M_{it} is a variable that is used as an instrument to identify the system of the two above equations. Similar to Edwards (2001), we use the tropics and independence to ensure the identification of our system of equations. λ is a loading factor (see Miranda and Rabe-Hesketh, 2006), and ζ_t is a latent variable that induces dependence between $u_{1it} = \lambda \zeta_t + \varepsilon_{it}$ and $u_{2it} = \zeta_t + \omega_{it}$. Assuming a bivariate normal distribution for (u_{1it}, u_{2it}) , given, that $(\zeta_t, \varepsilon_{it}, \omega_{it})$ are $N(0,1)$, the respective residual covariance matrix Ω corresponds to:

$$\Omega = \text{Cov}[(u_{1it}, u_{2it})'] = \begin{pmatrix} \lambda^2 + 1 & \lambda \\ \lambda & 2 \end{pmatrix} \quad (4)$$

giving a correlation coefficient

$$\rho = \frac{\lambda}{\sqrt{\lambda^2 + 1}}$$

c. Treatment effects and selection bias.

Our second means of addressing potential simultaneity is to use PSM methods that have been developed in the treatment effect literature and have been applied recently to evaluations of macroeconomic policy (e.g., Persson 2001, Glick et al., 2006, Lin and Ye 2007, 2009, 2010; Thornton and Vasilakis 2018). In our case, the objective is to evaluate the treatment effect of dollarization in countries that have adopted it. To estimate the average treatment effect on the treated (ATT), we consider the following equation:

$$ATT = E[Y_{i1}|D_i = 1] - E[Y_{i0}|D_i = 1] \quad (5)$$

where D is the dollarization dummy, $[Y_{i0}|D_i = 1]$ is the value of the outcome that would have been observed if a dollarization adopter country had not adopted such a framework, and $[Y_{i1}|D_i = 1]$ is the outcome value that is observed in the same country. The difficulty in estimating ATT is that the second term on the right-hand side $E[Y_{i0}|D_i = 1]$ is not observable. We cannot observe developments in GDP growth or inflation in a dollarization adopting country had it not adopted such a regime. If a country's choice of monetary framework was random, one could obtain ATT by comparing the sample mean of the treatment group (dollarization adopters) with that of the control group (non-dollarization adopters). If the decision to adopt dollarization were not random, then we would have the selection on observables problem. This can be addressed by making use of PSM methods. The main idea of matching is to use a control group to mimic a randomized experiment. The assumption needed to apply the matching method is the conditional independence

assumption ($Y_0, Y_1 \perp D|X$), which requires that conditional on X , the outcomes be independent of the dollarization dummy. Under this assumption, Equation (5) can be rewritten as:

$$ATT = E[Y_{i1}|D_i = 1, X_i] - E[Y_{i0}|D_i = 0, X_i] \quad (6)$$

in which $E[Y_{i0}|D_i = 1, X_i]$ is replaced with $E[Y_{i0}|D_i = 0, X_i]$, which is observable.

One matching method would be to match the treated countries to the control countries with similar values of X . As the number of covariates in X increases, matching on X would be difficult to implement in practice. To deal with this problem, we match the treated units and the control units on their propensity scores. The propensity score is the probability of policy adoption conditional on X and can be estimated using a simple probit or logit model. A further assumption needed for the validity of propensity score matching is the common support assumption ($p(X_i) < 1$), which requires the existence of a comparable control group of countries for the treated countries. When PSM is used, the ATT can be estimated as:

$$ATT = E[Y_{i1}|D_i = 1, p(X_i)] - E[Y_{i0}|D_i = 0, p(X_i)] \quad (7)$$

We make use of four common PSM methods. The first method is nearest-neighbor matching with replacement, which matches each treated country to the n control countries that have the closest propensity scores. We use two nearest-neighbor matching estimators: $n=1$ and $n=3$. The second method is radius matching, which performs the matching based on estimated propensity scores falling within a certain radius R . We use a wide radius ($r=0.05$), a medium radius

($r = 0.03$), and a tight radius ($r = 0.01$). The third method is the kernel matching method, which matches a treated group country to all control group countries weighted in proportion to the closeness between the treated group country and the control group country. The final method is the regression adjusted local linear matching method developed by Heckman et al. (1998).

4. Results

4.1. Panel results

Panel regression results for output growth and its volatility are reported in Table 3. Our main variable of interest is *Post * Dollarization*. In the GDP growth estimates (columns 1 and 2) the coefficient is positive and statistically significant indicating that output growth is relatively stronger in strictly dollarized economies. This contrasts with Edwards and Magendo (2003, 2006) who find no impact of dollarization on output growth. In the GDP growth volatility estimates (columns 3 and 4), the coefficients on *Post * Dollarization* are also positive and statistically, indicating that higher GDP growth relative to non-dollarized economies comes at the cost of higher GDP growth volatility. The coefficients on the control variables suggest that more flexible exchange rate regimes are associated with lower GDP growth and greater GDP growth volatility, and that openness to trade and capital flows reduces growth volatility.

The results for the impact of dollarization on inflation and inflation volatility are reported in Table 4. The coefficients on *Post * Dollarization* are negative and statistically significant for both the GDP and CPI measures of inflation and inflation volatility. That is, dollarization is

associated with relatively lower and more stable average inflation in strictly dollarized economies. In these estimates, the control variables perform somewhat better. Inflation and the variability of inflation are lower in larger and higher income countries that are more open to capital flows but tend to be higher in countries with more flexible exchange rate regimes that are more open to foreign trade.

The Edwards (2001) and Edwards and Magendzo (2003, 2006) studies covered a much earlier sample period (1970-1998) than ours. To determine whether this is a factor explaining the differences in our findings, we split our sample into 1980-2000 and 2001-2021 to look for evidence of a changing impact of dollarization on the relative growth and inflation performances over time. The results for GDP growth and its volatility are reported in Table 5. In the GDP growth estimates (columns 1 and 2) the coefficients on *Post * Dollarization* remain positive and statistically significant in both periods indicating that dollarization persistently raises relative real GDP growth. However, in the growth volatility estimates (columns 3 and 4), while the coefficients are statistically significant in both periods, the sign of the coefficient changes from positive in the earlier period to negative in the later one. In other words, over time, strict dollarization appears to have been associated with both higher and more stable GDP growth. The results for inflation and inflation volatility are reported in Table 6. The coefficients on *Post * Dollarization* are negative and statistically significant for both measures of inflation in both periods. That is, inflation has consistently been relatively lower and more stable in strictly dollarized economies.

4.2. Joint Maximum Likelihood Estimation results

Our results from MLE are presented in Tables 7 and 8. In columns 1 and 3 of Table 7 and columns 1, 3, 5 and 7 of Table 8 the results are for the first equation in the system (Equation (2)) where the dependent variable indicates whether or not the country is dollarized. In both sets of results, the tropical variable demonstrates a positive and significant effect on dollarization, and the coefficient for latitude exhibits an opposite sign and significance, indicating its role in the identification of the two-equation system.

In columns 2 and 4 of Table 7 and columns 2, 4, 6 and 8 of Table 8 the results are for the second equation in the system (Equation (3)). In Table 7 the coefficients associated with the dollarization variable are positive and statistically significant for both GDP growth and GDP growth volatility, indicating that dollarization is associated with higher but less stable rates of GDP growth. This is consistent with the panel regression result for the full sample period reported in Table 3. In Table 8 the signs on the coefficients associated with dollarization are negative and statistically significant, indicating that dollarization is associated with lower and more stable rates of inflation. This is consistent with the panel regression result for the full sample period reported in Table 4. In addition, the non-significance of the error-correlation term in both tables across columns suggests the absence of evidence supporting simultaneity between dollarization and the economic performance variables. Accordingly, the estimations derived from applying an OLS model appear to be preferable to those obtained through MLE.

4.3. Estimating the average treatment effects on output growth, inflation and their variability

4.3.1 Propensity scores

The first step is to test for factors that increase the probability that a country adopts dollarization. To this end, we employ a panel binary response model to test for factors that increase the probability that will be adopted will be adopted. In the model, the dependent variable $y_{i,t}$ ($i = 1, \dots, N; t = 1 \dots T$) is a dummy variable that takes the value 1 if a country i adopted dollarization in year t , and 0 otherwise.¹⁰ As there are unobserved characteristics, the appropriate specification is a panel probit model with random effects that is estimated using maximum likelihood. Our general model is:

$$y_{i,t}^* = \alpha + \beta' \delta_{i,t-1} + \mu_i + \epsilon_{i,t} \quad (8)$$

$$i = 1, \dots, N; t = 1, \dots, t$$

where $y_{i,t} = 1$ if $y_{i,t}^* > 0$, $y_{i,t} = 0$ if $y_{i,t}^* \leq 0$; $y_{i,t}^*$ is an unobserved latent variable that describes the decision to adopt dollarization, β is a vector of parameter estimates, μ_i is the unobserved random effect that is uncorrelated with explanatory variables, $\epsilon_{i,t}$ is normally, independently and identically distributed error term with mean 0 and variance 1; and $\delta_{i,t-1}$ are explanatory variables. Following common practice, we include a one-year lag of the explanatory variables to limit potential endogeneity.

The probability of adopting dollarization is given as:

$$P(y_{i,t} = 1 | x_{i,t-i} \mu_i) = \varphi[\alpha + \beta' \delta_{i,t-1} + \mu_i]. \quad (9)$$

¹⁰ See Cameron and Trivedi (2005) and Baltagi (2008).

The explanatory variables that we include are drawn mainly from Edwards and Magendzo (2003, 2006) and Edwards (2001) and include a country's size, its openness to capital and foreign trade flows, its degree of exchange rate flexibility, the level of GDP per capita, whether or not a country or territory is independent, and its geographic location represented by latitude and whether it is located in the tropics. The probit results are reported in Table 9.

These results indicate that the probability of being a strictly dollarized country is higher for smaller, poorer and less independent economies, that have less flexible exchange rate regimes, that are more open to trade and capital flows ,and that are in tropical locations.

4.3.2 Results from matching

The estimated ATTs for output growth, inflation and their variability are shown in Table 10. The results for GDP growth and its volatility are reported in lines 1 and 2 of the table. The ATTs are positive, highly statistically significant, and quite large in magnitude. The average rate of per capita real GDP growth in dollarized countries rises by between 15.2% to 29.5% relative to non-dollarized countries following the adoption of dollarization. Annual GDP growth volatility is also higher, though the difference is much less marked, with the ATTs ranging from 2.6% to 5.2%. That is, consistent with the results from panel regressions and Joint Maximum Likelihood regressions, real GDP growth per capita is substantially higher but somewhat less stable in dollarized economies relative to others.

The estimated ATTs for inflation and its volatility are reported in lines 3 and 4 for the GDP deflator measure of inflation and in lines 5 and 6 for CPI measure. In all of these cases the ATTs

are negative and statistically significant. That is, inflation is lower and less stable in dollarized relative to non-dollarized economies. In the case of the GDP deflator, average inflation is 1.3% to 2.9% lower and inflation volatility is 0.8% to 2.2% lower. On the CPI measure, inflation is between 1.4% and 2.3% lower and inflation variability is between 1.1% and 1.8% lower. The relative performance of inflation under dollarization in these estimates is also consistent with the results from panel regressions and Joint Maximum Likelihood regressions.

5. Conclusions

In this paper we have revisited the question of the relative economic performance of strictly dollarized economies, as measured by the annual growth of GDP per capita and inflation and the volatilities of these series. Our data sample is more recent and includes a much larger number of dollarized and non-dollarized countries than previous studies and our results are generally more supportive of strict dollarization as its impacts relative GDP growth and inflation. In particular, they suggest that countries that adopted strict dollarization experienced higher average GDP growth rates and lower inflation rates and lower inflation volatility over 1980 to 2021 than countries that did not adopt dollarization. Moreover, GDP growth appears also to have been relatively less volatile in dollarized countries over the period 2001 to 2021. Accordingly, though there may be reasons for a country not to adopt strict dollarization, they do not appear to include a deterioration in economic performance as measured by GDP growth and inflation and their volatilities. Indeed, strict dollarization might well improve economic performance on these measures.

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Table 1

Fully “dollarized” independent nations and non-independent territories

Country or territory	Currency used	Since	Population (2021)	GDP per capita and inflation data availability under dollarization	
				GDP and GDP deflator	CPI inflation
<i>(a) Countries</i>					
Andorra	French franc, Spanish peseta, euro	1278	79,034	1970-2021	na
Ecuador	US dollar	2000	17,797,737	2000-2021	2000-2021
El Salvador	US dollar	2001	6,414,167	2001-2021	2001-2021
Kiribati	Australian dollar	1943	128,874	1979-2021	2007-2021
Kosovo	Euro	2002	1,786,038	2008-2021	2003-2021
Lichtenstein	Swiss franc	1921	39,039		
Marshall Islands	US dollar	1944	42,050	1987-2021	na
Micronesia	US dollar	1944	113,131	1986-2022	2000-2022
Monaco	French franc, euro	1865	36,686	1970-2021	na
Montenegro	Euro	2002	619,211	2002-2021	2006-2021
Nauru	Australian dollar	1914	12,511	2004-2021	na
Palau	US dollar	1944	18,024	2000-2021	2002-2021
Panama	US dollar	1904	4,351,267	1970-2021	1970-2021
San Marino	Italian lira, euro	1897	33,745	1997-2001	2004-2021
Timor-Leste	US dollar	2000	1,320,942	2000-2021	2003-2021
Tuvalu	Australian dollar	1976	11,204	1990-2021	na
Zimbabwe	Foreign currencies	2009	15,993,523	2009-2021	2009-2021
<i>(b) Non-independent territories</i>					
American Samoa	US dollar	1792	45,035	2002-2022	na
Aruba	Dutch guilder, euro	1828	106,537	1986-2021	1985-2019
Curaçao	Dutch guilder, euro	1855	152,369	2001-2021	2001-2021
Greenland	Danish krone	1875	56,653	1970-2022	na
Puerto Rico	US dollar	1901	3,262,393	1970-2022	na
Turks and Caicos	US dollar	1973	45,114	2011-2022	na
US Virgin Islands	US dollar	1934	105,870	2022-2022	na

Sources: World Bank, World Development Indicators database; The Statesman’s Yearbook (various issues); Edwards (2001)

Note: Liberia was dollarized during 1847-1982 but reliable GDP and inflation data are not available for the dollarization period that overlaps with our study.

Territories that employ a “foreign” currency but for which GDP and inflation data are not available include the British Virgin Island, Bonaire, Cocos Islands, Channel Islands, Cook Islands, Guam, Niue, Norfolk Islands, Northern Mariana Islands, Pitcairn Islands, French Guinea, Martinique, Mayotte, Réunion Island, Saint-Martin, Tokelau, and Vatican City.

Table 2.
Summary statistics

	Dollarized countries or territories				Non-dollarized countries			
	Mean	Standard deviation	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum
GDP growth	1.482	3.473	-3.986	7.110	1.917	3.386	-3.986	7.110
GDP growth volatility	3.505	1.951	0.934	6.905	3.155	1.925	0.934	6.905
GDP inflation	4.038	4.206	0.105	24.526	8.369	7.776	0.105	24.526
GDP inflation volatility	2.739	2.841	0.907	18.580	6.215	5.777	0.907	18.580
CPI inflation	3.163	3.347	0.628	21.978	7.642	6.777	0.628	21.978
CPI inflation volatility	2.367	2.075	0.776	12.617	4.875	3.782	0.775	12.617
GDP per capita	9.273	1.288	6.781	12.227	8.349	1.467	5.112	11.765
Capital openness	0.787	0.285	0.000	1.000	0.459	0.362	0.000	1.000
Trade openness	117.96	81.521	22.500	442.620	76.702	50.095	0.000	442.100
Population	12.309	2.240	9.125	16.694	15.536	2.016	10.610	21.068
Latitude	22.777	20.291	0.523	71.706	24.902	16.362	0.024	64.963
Exchange rate regime	1.122	0.564	1.000	5.000	2.069	1.275	1.000	8.000
Independence dummy	0.674	0.469	0.000	1.000	0.947	0.222	0.000	1.000
Tropical country dummy	0.674	0.457	0.000	1.000	0.546	0.498	0.000	1.000

Note: Definitions and data sources are given in the appendix.

Table 3

OLS estimates: dollarization, GDP growth, and GDP growth volatility

	(1)	(2)	(3)	(4)
	GDP growth		GDP growth volatility	
Post	-1.029** (0.513)	2.4169** (1.168)	-3.732** (0.244)	-1.7607** (0.575)
Post*Dollarization	3.186*** (0.688)	1.920*** (0.547)	8.844*** (0.978)	1.212** (0.965)
GDP per capita		0.493 (0.557)		6.632 (23.733)
Capital openness		0.662 (0.486)		-1.770*** (0.481)
Trade openness		-0.008 (0.011)		-0.150 (0.179)
Exchange rate regime		-0.836*** (0.101)		4.162*** (0.819)
Log of population				-7.531*** (2.735)
Intercept	1.883*** (0.070)	0.458 (15.325)	44.353*** (5.155)	87.851** (355.007)
Observations	8,419	7,744	7,543	7,016
R ²		0.383	0.001	0.194
Year fixed effects	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES

Notes: Robust standard errors in parenthesis. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively. The list of countries and territories that are dollarized is given in Table 1 and variable definitions are given in the Appendix

Table 4

OLS estimates: dollarization, inflation and inflation volatility

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	GDP inflation		CPI inflation		GDP inflation volatility		CPI inflation volatility	
Post	6.862*** (2.057)	10.824*** (4.080)	9.586*** (1.504)	7.801*** (2.279)	4.200*** (0.970)	-6.682* (3.216)	2.806*** (0.756)	-4.095** (1.637)
Post*Dollarization	-1.2613*** (0.062)	-0.300*** (0.104)	-5.018*** (1.527)	-2.986*** (1.451)	-8.822*** (0.978)	-1.623*** (0.782)	-6.574*** (0.754)	-0.434*** (0.055)
GDP per capita		-3.491*** (0.507)		-1.973*** (0.442)		-2.163*** (0.427)		-2.226*** (0.260)
Capital openness		-5.815*** (0.572)		-4.686*** (0.439)		-3.357*** (0.513)		-2.203*** (0.297)
Trade openness		0.021*** (0.005)		0.028*** (0.004)		0.015*** (0.003)		0.005*** (0.002)
Exchange rate regime		2.516*** (0.181)		2.911*** (0.163)		1.701*** (0.154)		1.559*** (0.101)
Log of population		-0.335 (0.737)		2.120*** (0.610)		-3.377*** (0.644)		-2.561*** (0.377)
Intercept	9.743*** (0.134)	27.849* (12.331)	8.770*** (0.119)	-15.925 (10.223)	7.422*** (0.109)	71.604*** (10.801)	4.875*** (0.073)	53.847*** (6.380)
Observations	8,299	7,677	7,398	6,906	7,543	7,016	7,159	6,520
R ²	0.018	0.494	0.017	0.594	0.018	0.472	0.039	0.569
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

Notes: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively. The list of countries and territories that are dollarized is given in Table 1 and variable definitions are given in the Appendix.

Table 5

OLS estimates: dollarization and GDP growth and GDP growth volatility—split sample

	GDP growth		GDP growth volatility	
	1980-2000	2001-2021	1980-2000	2001-2021
Post	-8.456*** (6.526087)	4.780*** (13.302)	2.512*** (0.488)	-5.031* (3.375)
Post*Dollarization	0.8232*** (0.063)	3.0345*** (0.6565)	1.899*** (0.633)	0.891*** (0.068)
GDP per capita	0.387 (1.054)	0.241 (1.617)	-2.252*** (0.872)	8.404*** (2.481)
Capital openness	1.246*** (0.620)	0.478 (1.212)	-2.886*** (0.466)	1.493** (0.287)
Trade openness	0.029** (0.011)	-0.027 (0.024)	0.246 (0.567)	-0.046 (0.036)
Exchange rate regime	-0.739*** (0.144)	-0.829*** (0.197)	1.450*** (0.496)	7.636*** (2.955)
Log of population	-2.850** (1.605)	-1.286 (2.353)	-6.748*** (1.727)	-7.965*** (1.404)
Intercept	44.565*** (28.340)	24.127 (43.340)	44.101*** (8.744)	55.094 (20.4067)
Observations	3,969	3,775	3,969	3,541
R ²	0.455	0.396	0.552	0.453
Year fixed effects	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES

Notes: Robust standard errors in parenthesis. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively. The list of countries and territories that are dollarized is given in Table 1 and variable definitions are given in the Appendix

Table 6

OLS estimates: dollarization and inflation and inflation volatility—split sample

	GDP inflation		GDP inflation volatility		CPI inflation		CPI inflation volatility	
	1980-2000	2001-2021	1980-2000	2001-2021	1980-2000	2001-2021	1980-2000	2001-2021
Post	25.175*** (4.927)	31.169*** (5.643)	5.128** (3.926)	18.148*** (4.499)	-5.332 (4.428)	1.900 (2.081)	-5.617** (2.540)	1.046 (2.134)
Post*Dollarization	-3.675*** (0.305)	-38.288*** (2.031)	-1.546** (0.131727)	-2.263*** (0.563)	-1.845** (0.701)	-0.800** (0.460)	-6.799*** (0.954)	-0.557** (0.349)
GDP per capita	-6.627*** (0.956)	-6.219*** (1.093)	-5.023*** (0.782)	-2.885*** (0.782)	-4.246*** (0.854)	-2.604*** (0.815)	-4.247*** (0.474)	-3.454*** (0.414)
Capital openness	-6.876*** (1.014)	-0.876 (1.098)	-5.966*** (0.904)	-0.893 (0.810)	-5.243*** (0.782)	-2.845*** (0.882)	-3.269*** (0.504)	-0.991** (0.574)
Trade openness	0.047*** (0.012)	0.012*** (0.005)	0.021** (0.008)	0.008 (0.003)	0.041*** (0.009)	0.037*** (0.0061)	-0.001 (0.005)	0.004*** (0.001)
Exchange rate regime	2.777*** (0.261)	1.561*** (0.310)	1.333*** (0.218)	0.409*** (0.240)	2.992*** (0.242)	2.838*** (0.283)	1.359*** (0.148)	1.126*** (0.171)
Log of population	-1.071 (1.887)	-6.654*** (1.455)	-8.768*** (1.604)	-4.777*** (1.09)	5.286*** (1.556)	0.204 (1.029)	-2.315*** (0.913)	-1.944*** (0.597)
Intercept	56.603** (30.836)	150.341*** (24.569)	176.909*** (25.758)	95.7614*** (18.100)	-41.050** (25.419)	14.961 (18.039)	73.015*** (14.796)	56.380*** (9.633)
Observations	3,769	3908	3,475	3541	3217	3,689	3,047	3473
R ²	0.5778	0.675	0.582	0.654	0.652	0.589	0.678	0.767
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

Notes: ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively. The list of countries and territories that are dollarized is given in Table 1 and variable definitions are given in the Appendix

Table 7

Joint Maximum Likelihood estimation: dollarization and GDP growth and GDP growth volatility

	(1)	(2)	(3)	(4)
	Dollarization	GDP growth	Dollarization	GDP growth volatility
GDP per capita	-1.307*** (0.379)	-0.043 (0.311)	0.487 (0.333)	-1.131*** (0.387)
Capital openness	7.220*** (1.498)	-0.707 (0.814)	3.496*** (0.750)	-2.368*** (0.560)
Trade openness	0.018*** (0.004)	0.003 (0.005)	0.004 (0.004)	-0.011 (0.006)
Exchange rate regime	-4.962*** (1.368)	-0.559*** (0.131)	-2.324*** (0.374)	0.377*** (0.059)
Log of population	-1.893*** (0.492)	0.392*** (0.128)	0.097 (0.579)	-0.546 (0.883)
Latitude	-0.185*** (0.049)		-0.016*** (0.000)	
Tropical location dummy	0.757*** (0.040)		0.888* (0.520)	
Dollarization		36.487*** (4.341)		2.326*** (0.455)
Intercept	36.874*** (10.715)	-3.314 (2.529)	-6.812 (6.737)	18.544 (11.430)
Observations	7,798	7,798	7,798	7,798
Year fixed effects	YES	YES	YES	YES
Error Correlation(p-value)		0.156		0.989

Note: ***, ** and * indicate statistical significance at 1, 5 and 10 percent levels, respectively. The list of countries and territories that are dollarized is given in Table 1 and variable definitions are given in the Appendix

Table 8

Joint likelihood estimation: dollarization and inflation and inflation volatility

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dollarization	GDP inflation	Dollarization	GDP inflation volatility	Dollarization	CPI inflation	Dollarization	CPI inflation volatility
GDP per capita	-0.020 (0.152)	-1.834*** (0.206)	0.038 (0.173)	-1.550*** (0.104)	0.175 (0.284)	-1.398*** (0.113)	-0.594** (0.236)	-1.526*** (0.097)
Capital openness	4.343*** (0.755)	-7.154*** (0.896)	4.940*** (0.609)	-3.790*** (0.647)	3.504*** (1.003)	-5.4042*** (0.600)	3.808*** (1.071)	-2.164*** (0.478)
Trade openness	-0.001 (0.002)	0.011*** (0.003)	-0.003 (0.002)	0.003 (0.002)	0.009* (0.004)	0.005* (0.003)	0.006** (0.003)	-0.001 (0.002)
Exchange rate regime	-3.108*** (0.465)	3.511*** (0.334)	-3.137*** (0.567)	2.318*** (0.185)	-3.827*** (0.888)	3.561*** (0.240)	-5.721*** (1.595)	1.717*** (0.155)
Log of population	-0.206** (0.087)	-0.107 (0.116)	-0.081 (0.091)	-0.481*** (0.056)	-1.073*** (0.266)	-0.822*** (0.071)	-0.732*** (0.143)	-0.686*** (0.057)
Latitude	-0.004*** (0.000)		-0.015*** (0.002)		-0.010** (0.002)		-0.013** (0.004)	
Tropical location dummy	1.369*** (0.443)		1.782** (0.771)		4.067*** (1.317)		2.858*** (0.789)	
Dollarization		-7.465*** (1.283)		-5.697*** (0.530)		-6.272*** (1.050)		-3.912*** (0.375)
Intercept	1.111 (1.646)	19.697*** (1.886)	-2.171 (2.281)	23.254*** (1.101)	8.109* (3.858)	27.920*** (1.494)	13.935*** (3.755)	26.443*** (1.220)
Observations	7,798	7,798	7,798	7,798	7,798	7,798	7,798	7,798
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Error Correlation(p-values)		0.123		0.235		0.352		0.348

Note: ***, ** and * indicate statistical significance at 1, 5 and 10 percent levels, respectively. The list of countries and territories that are dollarized is given in Table 1 and variable definitions are given in the Appendix.

Table 9

Probit estimates of propensity scores for adopting dollarization

GDP per capita	-0.384*** (0.041)
Capital account openness	3.033*** (0.185)
Trade openness	0.003*** (0.001)
Exchange rate regime	-2.586*** (0.413)
Log of population	-0.241*** (0.024)
Latitude	-0.009** (0.003)
Tropical location dummy	0.805*** (0.121)
Independence dummy	-1.262*** (0.1008)
Intercept	6.307*** (0.767)
Pseudo R ²	0.579
Observations	7,798

Notes. Dependent variable is a dummy variable equal to one if a country or territory is dollarized and zero otherwise. Robust standard errors in parenthesis. *** and ** indicate statistical significance at the 1 and 5 percent levels, respectively. Variable definitions are given in the Appendix.

Table 10

Matching Estimates of overall treatment effects using the full sample

	Nearest Neighbor Matching	Three-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
			Wide	Medium	Narrow		
GDP growth	27.724*** (2.309)	29.508*** (2.219)	26.538*** (2.311)	15.197*** (2.269)	24.815*** (2.300)	28.784*** (2.334)	27.088*** (2.275)
GDP growth volatility	3.628 (1.346)	2.567*** (0.782)	4.858*** (1.544)	5.178*** (1.271)	4.847** (1.777)	3.001** (1.008)	5.208*** (1.303)
GDP inflation	-2.991** (1.214)	-1.332** (0.457)	-2.214*** (0.431)	-1.935*** (0.469)	-1.935*** (0.469)	-2.886** (0.991)	-2.209*** (0.461)
GDP inflation volatility	-1.333* (0.709)	-1.556** (0.609)	-2.211*** (0.429)	-0.823*** (0.066)	-2.066*** (0.448)	-2.176*** (0.614)	-2.161*** (0.419)
CPI inflation	-1.427** (0.657)	-1.682** (0.604)	-2.276*** (0.452)	-1.984*** (0.569)	-2.072*** (0.491)	-2.048*** (0.479)	-2.312*** (0.437)
CPI inflation volatility	-1.810*** (0.505)	-1.139*** (0.196)	-1.474*** (0.415)	-1.516*** (0.199)	-1.474*** (0.194)	-1.507*** (0.318)	-1.494*** (0.178)

Note: A 0.06 fixed bandwidth and an Epanechnikov kernel are used for kernel and local linear regression matching. Bootstrapped standard errors for ATT are reported in parenthesis.

***, ** and * indicate statistical significance at 1, 5 and 10 percent levels, respectively.

Appendix

Variable definitions and data sources

Variable	Definition	Source
GDP growth	Annual percent change in real GDP per capita at constant 2015 US dollars	World Bank, WDI
GDP growth volatility	Centered five-year moving average of the standard deviation of annual GDP growth	World Bank, WDI
GDP inflation	Annual percent change in the GDP deflator	World Bank, WDI
GDP inflation volatility	Centered five-year moving average of the standard deviation of annual GDP inflation	World Bank, WDI
CPI inflation	Annual percent change in the consumer price index	World Bank, WDI
CPI inflation volatility	Centered five-year moving average of the standard deviation of annual CPI inflation	World Bank, WDI
GDP per capita	Real GDP per capita in 2015 US dollars	World Bank, WDI
Capital account openness	The Chinn and Ito (2006) capital openness index, which ranges from 1 (least open) to 5 (most open).	Chinn and Ito (2006)
Trade openness	Ratio of imports plus exports to GDP	World Bank, WDI
Population	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. Estimates are mid-year.	World Bank, WDI
Latitude	The distance North or South of the Equator measured in degrees.	The World Factbook
Exchange rate regime	The Ilzetzki et al. (2021) coarse grid categorization of exchange rate regimes, which ranges from 1 (least flexible) to 5 (most flexible).	The Ilzetzki et al. (2021)
Independence dummy	Dummy variable equal to one if a country is independent and zero otherwise	The World Factbook
Tropical country dummy	Dummy variable equal to one if a country is located in the tropics and zero otherwise.	The World Factbook