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Does dollarization mean importing the Fed's monetary policy?

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Does Dollarization Mean Importing the Fed's Monetary Policy?

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Does Dollarization Mean Importing the Fed's Monetary Policy?¹

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June 11, 2024

Abstract

The electoral campaign of Argentina's new president Javier Milei has revived the debate over the pros and cons of dollarization. Critics argue that dollarizing would force Argentina to import the monetary policy of the Federal Reserve, regardless of whether the Fed's policies are appropriate for it. But because of the centrality of the dollar in the global economy, U.S. monetary policies tend to spill over to foreign economies, whether or not they have their own currency. In this paper, we address this issue empirically by comparing the response to changes in U.S. interest rates of domestic deposit and loan rates in three Latin American dollarized economies (Ecuador, El Salvador, and Panama) and three non-dollarized economies (Chile, Colombia, and Mexico). We find, first, that domestic bank interest rates are not perfectly responsive to U.S. interest rates, even in dollarized economies; this may reflect barriers to capital flows, domestic controls, and/or uncompetitive banking markets. Second, deposit interest rates do appear to be somewhat more linked to U.S. interest rates in dollarized economies than in non-dollarized economies. Third, however, bank loan rates are at least as responsive to U.S. interest rates in non-dollarized economies as in dollarized ones. All told, we do not find stark differences between dollarized and non-dollarized economies in the response of domestic bank interest rates to U.S. rates. This suggests fears of importing U.S. monetary policy should not be a primary consideration as policymakers decide whether or not to dollarize their economy.

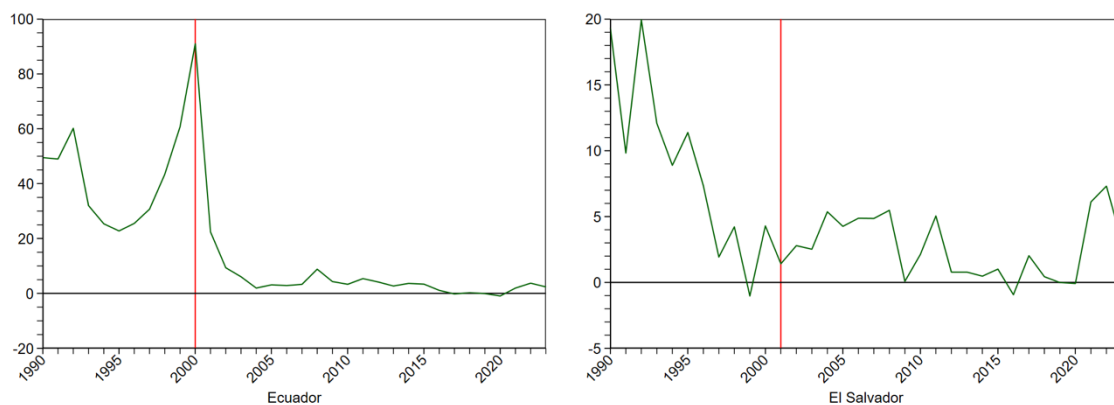
¹ We would like to thank José Gabriel Castillo Garcia, Gabriela Córdova and her colleagues at the Central Bank of Ecuador for helpful information, and Katherine Oleas for excellent research assistance.

I. Introduction

Argentina's new president Javier Milei has revived the debate over the pros and cons of dollarization. Milei campaigned on a promise to officially replace the peso with the dollar and to abolish the central bank. Since his inauguration, his administration has put off plans to dollarize—in part because it lacks the dollars to do so—and is focusing on reducing the fiscal deficit and stabilizing the economy. However, dollarization remains an option for the future and continues to be hotly debated by observers.

The key selling point for dollarization is that it is extraordinarily effective at suppressing inflation. Ecuador dollarized in 2000 following a decade of high inflation and rapid exchange rate depreciation. Since then, its inflation rate has fallen to about four percent, on average, compared with 40 percent in the 1990s. In El Salvador, which dollarized in 2001 after having already reduced inflation through a pegged exchange rate, inflation has averaged below three percent compared with about nine percent in the 1990s. Panama has used the dollar since its creation in 1904, and has generally had among the lowest inflation rates in the region.

Annual Inflation and Dollarization*



*Year of dollarization marked by vertical red line. Data are from CEIC.

Despite dollarization's successful record of squashing inflation, most economists do not like it.² They argue that dollarization will not necessarily eliminate the root cause of high inflation, which is large and persistent fiscal deficits. That is certainly true, but in a dollarized economy, printing money to finance fiscal deficits is (nearly) impossible, so these deficits must be financed by borrowing. This borrowing may lead to higher debt and possible default, as has occurred in Ecuador, but it does not trigger the high inflation and the resultant drag on savings, productivity, and growth that are caused by money-financed deficits.

Economists also argue that by fixing the exchange rate in perpetuity, dollarization would deprive Argentina of the ability to adjust relative prices in response to shocks. This is a more serious concern, but in the absence of dollarization, Argentina would likely continue to meddle in foreign exchange markets to try to restrain inflation, as it has done throughout its history. So it is unclear how much exchange rate flexibility Argentina would give up by dollarizing.

Finally, critics argue that dollarizing would force Argentina to import the monetary policy of the Federal Reserve, regardless of whether its business cycle is synchronized with that of the United States and whether the Fed's policies are appropriate for it. We do not believe this is a very compelling reason for holding off on dollarization. First, the cost of giving up monetary independence would be decidedly second-order compared with the benefits of substantially reducing the level and volatility of inflation. Second, because of the centrality of

² Kamin (2023) provides more detail on the case for dollarization in Argentina, while Sobel (2023) makes the case against it. See a recent webinar in which Kamin and Sobel debated the issue: <https://www.aei.org/events/should-argentina-dollarize/>.

the U.S. economy and the dollar in the global economy, U.S. monetary policies tend to spill over to foreign economies, whether or not they have their own currency; having one's own (floating) currency may buy the central bank some independence to manage the short-term interest rate, but broader financial conditions will still be importantly influenced by U.S. rates. These influences have been documented by a large and ever-growing research literature.³

And, third, even in dollarized economies, a number of factors could dampen the spillover of U.S. monetary policies to a fully dollarized economy. These include: regulations that impede capital flows and thus prevent full arbitrage of local and U.S. interest rates; regulations that interfere with the functioning of local financial markets and thus the setting of interest rates; and structural impediments to financial market functioning, such as lack of competition or banks that are too small, little-known, or risky to access foreign financial markets.

Therefore, in practice, the spillover of U.S. monetary policies to officially dollarized economies may be either greater or smaller than the spillover to non-dollarized economies. In this paper, we compare the spillovers of Fed policy to three official dollarized economies in Latin America—Ecuador, Panama, and El Salvador—with the Fed's spillovers to other, non-dollarized economies in the region—Chile, Colombia, and Mexico.

In gauging the spillovers of Fed policy, we focus on the effect of changes in U.S. interest rates on interest rates on bank loans and deposits. This approach differs from most analyses of

³ See, the review of this literature in Arteta et al. (2022).

Fed spillovers, which focus on relatively high-frequency data (e.g., daily) on asset market prices such as exchange rates, bond yields, and equity prices.⁴ However, Ecuador, El Salvador, and Panama not only lack exchange rates, but also deep and liquid markets for stocks and bonds. Accordingly, we focus on lower-frequency (monthly) moves in bank deposit and loan rates. In any event, in these bank-centric economies, deposit and loan rates are more important monetary factors influencing economic activity than stock and bond prices.

Specifically, for each economy, we estimate econometric equations explaining deposit and loan rates as a function of U.S. interest rates—the Fed funds rate and the 10-year Treasury yield—as well as a number of domestic control variables: economic activity, inflation, and the credit spread on international dollar-denominated bonds. We then compare the estimated coefficients on U.S. interest rates across countries to assess whether these are higher for dollarized or non-dollarized economies.

We find, first, that neither deposits rates nor lending rates are as tightly linked to U.S. interest rates as some commentaries would suggest, even for the dollarized economies; this may owe to the intermediation frictions noted above, including barriers to capital flows, domestic regulations, and less-than-competitive banking markets. Second, deposit interest rates do appear to be somewhat more linked to U.S. interest rates in dollarized economies than in non-dollarized economies. Third, however, U.S. interest rates seemed to be about as influential for lending rates in non-dollarized economies as in dollarized ones.

⁴An exception, and very relevant to our research, is Giraldo et al. (2023), which analyses the impact of U.S. monetary policy shocks on bank lending in the non-dollarized Latin American economies.

All told, we do not find stark differences between dollarized and non-dollarized economies in the response of domestic bank interest rates to U.S. rates. This suggests fears of importing U.S. monetary policy should not be a primary consideration as policymakers decide whether or not to dollarize their economy.

The plan of the paper is as follows. In Section II, we briefly describe the relevant characteristics of the banking and external payments systems in Ecuador, Panama, and El Salvador. Section III reviews the econometric strategy, data, and results. Section IV concludes.

II. Institutional Details

II.1 Ecuador

Ecuador formally adopted the dollar as its official currency in 2000, after a decade of high inflation and exchange rate depreciation. Bank deposits, loans, financial transactions, and currency (coin and bills) are all denominated in dollars. As in countries with their own currencies, private banks and other financial intermediaries hold reserves at the central bank, the Banco Central de Ecuador (BCE), but these are in dollars. Besides the reserves of private and public banks, the BCE also accounts for substantial deposits of the non-financial public sector, for which the BCE is its agent.

In a freely functioning banking system with an open capital account, one might expect a strong correlation between interest rates in Ecuador and the United States. However, this is not evident in the charts for Ecuador shown in Figures 1 and 2 below. Two factors are apparent. First, Ecuadorian deposit rates exceed U.S. rates by a substantial margin. This likely reflects the higher risk of Ecuadorian banks compared with in the United States. Secondly, Ecuador's

deposit rates are not well correlated with U.S. rates. Ignoring the short-term variations, Ecuadorian interest rates in the 2011-2021 period were higher than their trough in 2005-2006, whereas in the United States they were uniformly lower.

The correlation between Ecuadorian loan rates and U.S. interest rates is also quite low. Again, Ecuadorian loan rates are both quite high relative to the U.S. cost of funds and not well-correlated, although there appears to be more of a relationship than in the case of deposits.

A number of factors, besides the higher level of risk, likely explains the loose connection between Ecuadorian and U.S. interest rates. To begin with, Ecuador's capital account is not completely open. A tax on capital outflows likely reduces the responsiveness of Ecuadorian interest rates to changes in U.S. rates (Druck, Baltabaev, Erraez, and Burgura, 2021). The tax may also discourage capital inflows, since it raises the cost of repatriating those flows in the future. Besides formal regulations, the structure of the banking system also impedes capital mobility. Most Ecuadorian banks and other intermediaries are too small, little-known, and risky to access international capital markets. In principle, the largest Ecuadorian banks, which do have access to these markets, could channel funding to the smaller banks. However, given the concentrated and uncompetitive nature of the banking system, this arbitrage does not occur to a substantial extent. In consequence, external liabilities comprise only about 6 percent of the banking system's total funding.

The functioning of Ecuador's loan market is even more complicated. The government imposes caps on interest rates that are differentiated depending on both the type of loan (e.g., consumer, business, mortgage) and the type of borrower—large firms are subject to lower caps than smaller firms and especially microcredits. At a minimum, this constrains the scope for loan

interest rates to respond to changes in the cost of funding and in the risk of borrowers.

Furthermore, it likely distorts measured changes over time in weighted-average loan interest rates. Shifts in the composition of lending between different loan categories with different interest rate caps may lead to changes in weighted-average interest rates, even if rates for different loan categories are unchanged.

II.2 Panama

Panama adopted the dollar as its official currency in 1904, following its independence from Colombia and when the United States was in control of the Canal Zone. Unlike in the case of Ecuador, dollarization was motivated by a political strategy to strengthen the country's relationship with the United States rather than to stabilize a chaotic economy. And that is just the beginning of Panama's differences with Ecuador.

First, Panama has no central bank. All financial transactions between banks in Panama are mediated solely through private conduits, and there are no reserve requirements for Panamanian banks. International banks located in Panama provide liquidity to the system, substituting to some extent for the lender-of-last-resort function ordinarily provided by a central bank (Goldfajn and Olivares, 2001; Moreno-Villalaz, 2005).

Second, there are no capital controls, and the Panamanian banking market is fully integrated into the global financial system. This integration is reinforced by free entry into Panama's banking system, which has allowed foreign banks to garner a substantial share of the market—these banks act as conduits between local banks and international financial markets.

Finally, there are no controls on domestic interest rates and the banking market is competitive, supported in part by the free entry noted above.

II.3 El Salvador

El Salvador adopted the dollar as its official currency at the beginning of 2001. Again unlike in Ecuador, and more similarly to Panama, the move was a bid to tighten links to the United States and encourage foreign investment and trade (Swiston, 2011). The exchange rate had already been pegged to the dollar since 1993, and a stable exchange rate had underpinned low inflation and a stable banking system.

Like Ecuador, El Salvador retains a central bank which imposes reserve requirements on banks and manages the payments system. The central bank is also prohibited from lending to private banks, and interest rates are determined in the private market. There are no controls on interest rates, and the banking sector is considered competitive (Privacy Shield, 2023). However, with only 14 commercial banks, including two state-owned institutions, it is unclear how deep and liquid is the market for funds in the country.

Like Panama and unlike Ecuador, El Salvador's capital account is open. There are no foreign exchange controls, and much of the banking system is foreign-owned, enhancing its access to global financial markets.

Finally, in June 2021, the government adopted Bitcoin as an official currency alongside the U.S. dollar. It subsequently authorized the distribution of an e-wallet, Chivo, that could carry out digital payments in either dollars or bitcoin. (IMF, 2022) It is unclear what the ultimate effect of this change could be on interest-rate determination and monetary policy spillovers. However, for the time being, take-up has been too limited to have much of an effect at present.

III. Measuring the Response of Domestic Interest Rates to U.S. Rates

III.1 Methodology

As shown in Figures 1 and 2, because of the downtrends in many of the variables (interest rates, inflation) over estimation period, it is important to control for common trends and dynamics. Because of the various frictions and imperfections described earlier, changes in US interest rates may only affect deposit and lending rates in the six Latin American countries we examine with a considerable lag. Accordingly, we assess the impact of US monetary policy on domestic interest rates (both for deposits and lending) using an ARDL (autoregressive distributed lag) model. As indicated in the equation below, changes in the dependent variable y (either loan or deposit interest rates) are determined by the levels of the explanatory variables x in the long run, as measured by θ , a time trend, and current and lagged changes in the short run.

$$\Delta y_t = c_0 + c_1 t - \alpha(y_{t-1} - \theta x_{t-1}) + \sum_{i=1}^{p-1} \psi_{yi} \Delta y_{t-i} + \omega' \Delta x_t + \sum_{i=1}^{q-1} \psi'_{xi} \Delta x_{t-i} + u_t \quad (1)$$

We use data on the Federal Funds rate and US 10-year treasury bonds as our measure of US monetary policy. We also include domestic inflation, output gaps, and EMBI spreads as control variables. Our estimates utilize data available over the past 20 years. The equations are estimated separately for each country.

For the non-dollarized economies, we do not include as control variables the policy interest rates set by their respective central banks. To the extent that the central banks respond to changes in U.S. interest rates by adjusting their monetary policy, these policy rates may act as channels of transmission between U.S. rates and domestic bank rates. Accordingly, in order

to compare the spillovers of U.S. rates in dollarized and non-dollarized economies, we do not want to hold constant the policy rates in the latter jurisdictions.

III.2 Data

We estimate the equation above using monthly data from 2001 through 2019, depending on data availability. We end the sample in 2019 to abstract from the sharp economic dislocations associated with the Covid pandemic and its inflationary aftermath. All variables were seasonally adjusted. Our data on bank deposit and loan interest rates are drawn from central bank websites as detailed in the Appendix. Data on the federal funds rate and U.S. 10-year Treasury yield are drawn from the Federal Reserve Bank of St. Louis's FRED database. Inflation is measured as the 12-month percent change in consumer prices and is drawn from CEPAL and the CEIC database. Data on EMBI spreads of sovereign dollar bond yields over U.S. Treasuries for Latin American economies are drawn from the Central Bank website of Peru.

Finally, the output gap is based on the monthly level of economic activity, drawn from central bank websites. An HP filter is fitted to these data to identify the trend level of economic activity, and then the output gap is calculated as the percent deviation of actual activity from its trend.

Figure 1 provides a snapshot of the evolution of deposit interest rates in the six sample countries, comparing them with the two U.S. rates used in the study. Figure 2 presents analogous data for loan interest rates. Figures 3-5 present both of these rates alongside inflation, the output gap, and the EMBI spread, respectively.

III.3 Estimation Results

III.3.A Results for deposit rates

Table 1 presents the estimation results for dollarized economies, while Table 2 addresses the non-dollarized economies in our sample. For each equation, we show only the long-run effects of the explanatory variables on the dependent variable, along with the adjustment factor—the coefficient on the $(y_{t-1} - \theta x_{t-1})$ term in the equation above. The different columns of the tables for each country present estimations with different combinations of the control variables, adding them cumulatively to the original bivariate equation.⁵ To assess the existence of a statistically valid long-term relationship between the dependent and independent variables, we report on the results of the cointegration tests models for the ARDL reported in STATA,⁶ as well as the statistical significance of the coefficients for each of the individual regressors.

Focusing first on the dollarized economies, the results for Ecuador suggest that the Fed funds rate is a significant determinant of the deposit rate. Based on the results of the full model (column 7), about 80 percent of changes in the Fed funds rate are eventually reflected in deposit rates. There is also some evidence that increases in the 10-year Treasury yield reduce Ecuadorian deposit rates. The estimates for El Salvador's deposit rate follow a similar pattern,

⁵ If the time trend added in column 4 of the tables is not statistically significant, we drop it from the equations shown in higher-numbered columns.

⁶ These tests assess cointegration for both the stationary $I(0)$ and nonstationary $I(1)$ variables in the model. The results are reported in Tables 1-4 as the p values for these cointegration tests. P values below .10 or .05 indicate a rejection of the null hypothesis of no cointegration at those levels of significance.

with robustly significant positive coefficients on the Fed funds rate coupled with sometimes-significant negative coefficients on the 10-year Treasury yield (although few of the specifications pass both of the cointegration tests). Finally, in Panama, the coefficients on neither the Fed funds rate nor the 10-year Treasury yield are significant in most specifications; however, in the most complete model (column 7), the coefficient on the Fed funds rate is indeed estimated to be both significant and considerably larger than the (negative) coefficient on the Treasury yield. The R^2 for these equations is also much larger than for Ecuador and El Salvador, consistent with Panama being more competitive, more tightly linked to the global financial system, and with a much larger share of foreign banks.

All told, deposit rates in the dollarized economies are estimated to be quite responsive to the Fed funds rates, but with some, albeit weaker, evidence of a negative response to longer-term Treasury yields. It may be that downward changes in the slope in the U.S. yield curve are associated with recession or financial stresses, either of which might lead to greater risk aversion and thus higher deposit rates in risky countries.

What is also striking for all three dollarized economies is that the coefficient for the adjustment factor is low (between 0.06 to 0.11 per month), indicating that a considerable amount of time is needed for changes in the fed funds rate (and other determinants) to affect deposit rates. This also reflects that in many cases our data on interest rates measure the average for deposit rates, with some of these deposits having a maturity that goes beyond one month.

The evidence for an effect of U.S. interest rates on deposit rates in the non-dollarized economies is weaker than for the dollarized economies, and to the extent that there is an

effect, it appears to stem from the 10-year Treasury yield rather than the Fed funds rate. In Chile, U.S. Treasury yields significantly affect deposit rates in a few specifications, but the result is not robust to the inclusion of EMBI spreads. (Also, the coefficient on the Fed funds rate is significant but with a negative sign.) In Colombia, the U.S. interest rates generally are not significant except in the full model, which indicates a positive and significant coefficient on Treasury yields coupled with, again, a negative and significant coefficient on the Fed funds rate. Similarly, for Mexico, neither U.S. interest rates is significant except in the full model, where the coefficient on the Fed funds rate is weakly significant; additionally, none of the models pass the tests for cointegration.

III.3.B Results for lending rates

Turning to the evolution of lending rates, Table 3, the effect of U.S. interest rates in the dollarized economies is a mixed bag. In general, the relationship is weaker than for deposits, with smaller coefficients when variables are found to be significant. In Ecuador, none of the coefficients on U.S. interest rates are significant, once both the Fed funds rate and the Treasury yield are included in the same equation; the weak link with US interest rates likely reflects Ecuador's interest rate controls, as discussed above. The relationship appears a bit stronger in El Salvador, where in the full model, both the Fed funds rate and the Treasury yield positively and significantly affect lending rates. In Panama, similar to with deposit rates, changes in the Fed funds rates significantly boost lending rates while 10-year Treasury yields exert a negative but not significant effect.

For the non-dollarized economies, Table 4, the evidence for the influence of U.S. interest rates is mixed but at least as strong as for the dollarized economies. In Chile, US

interest rates have no significant impact on bank lending rates. In Colombia, however, almost all specifications indicate a significant link to the Fed funds rate, only partially offset by a negative but insignificant coefficient on the 10-year Treasury yield. In Mexico, lending rates respond strongly to both changes in the Fed funds rate and 10-year yields in most of the specifications shown.⁷

IV. Conclusion

In this paper, we addressed the question of whether dollarizing the economy means importing the monetary policy of the Federal Reserve, and to a greater extent than in non-dollarized economies. We compared the response of domestic bank deposit and lending interest rates to U.S. interest rates in three dollarized economies in Latin America—Ecuador, El Salvador, and Panama—to three non-dollarized economies—Chile, Colombia, and Mexico.

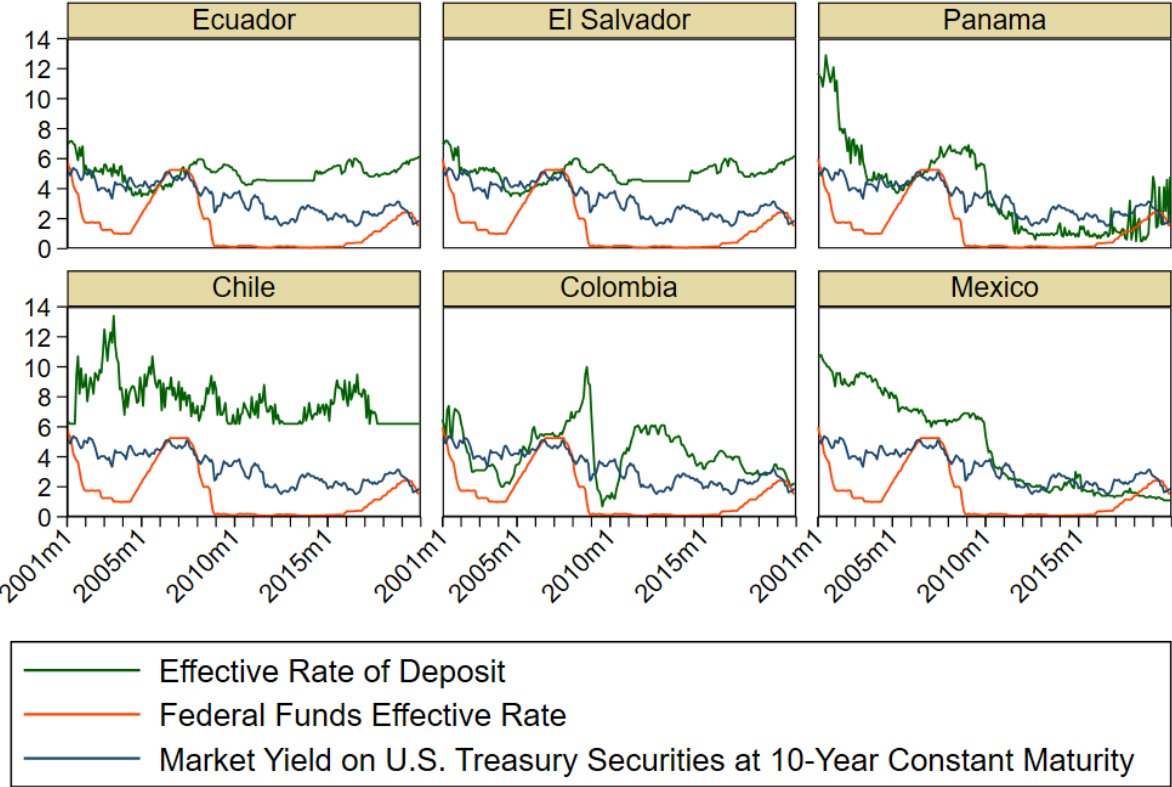
We find, first, that domestic bank interest rates are not perfectly responsive to U.S. interest rates, even in dollarized economies. It is possible that such factors as barriers to capital flows, domestic controls, and a lack of competition in banking markets may be impeding the response of domestic rates to U.S. rates. Second, deposit interest rates do appear to be somewhat more linked to U.S. interest rates in dollarized economies than in non-dollarized economies. Third, however, lending interest rates—which presumably have a larger impact on

⁷ The ARDL procedure failed to produce cointegration test results for the equation shown in column 7, suggesting, along with the sharp change in the coefficients, that these results should be disregarded.

the economy than deposit rates-- were at least as responsive to U.S. interest rates in non-dollarized economies as in dollarized ones.

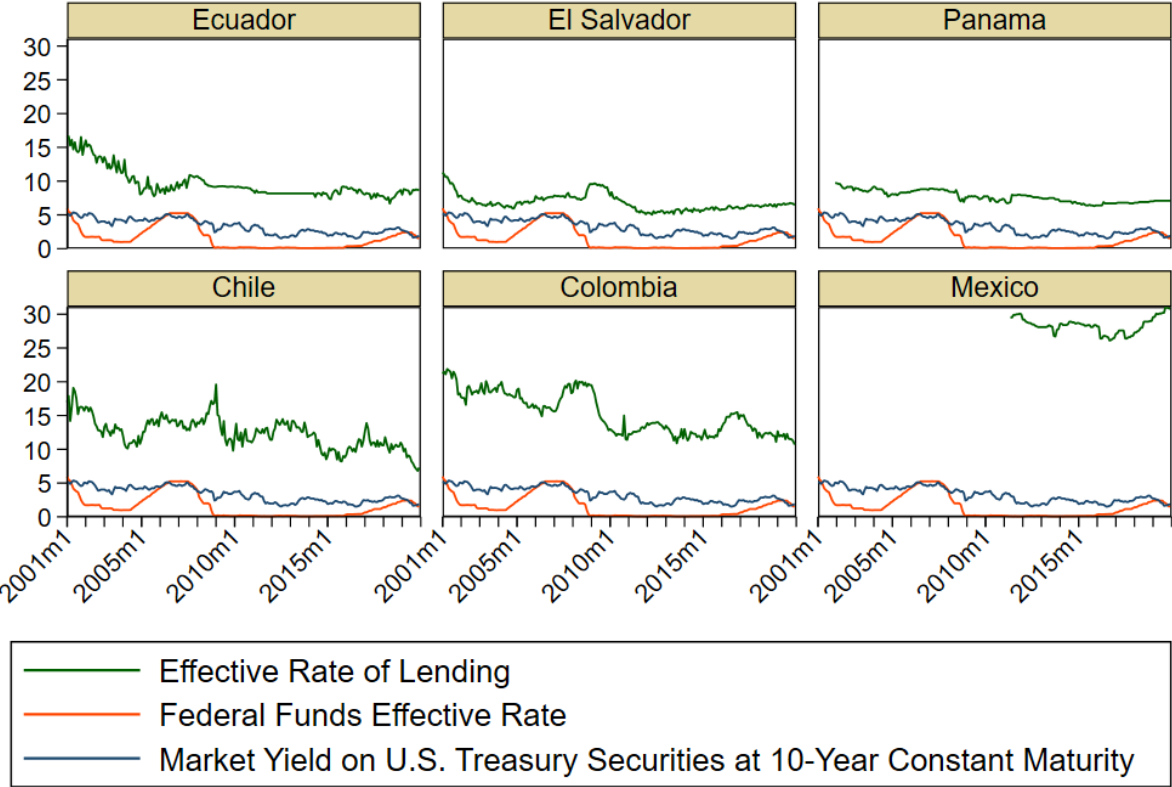
All told, we do not find stark differences between dollarized and non-dollarized economies in the response of domestic bank interest rates to U.S. rates. This suggests fears of importing U.S. monetary policy should not be a primary consideration as policymakers decide whether or not to dollarize their economy.

Figure 1. Deposit Rates, Fed Funds Rate, and U.S. Treasury Yields (percent)



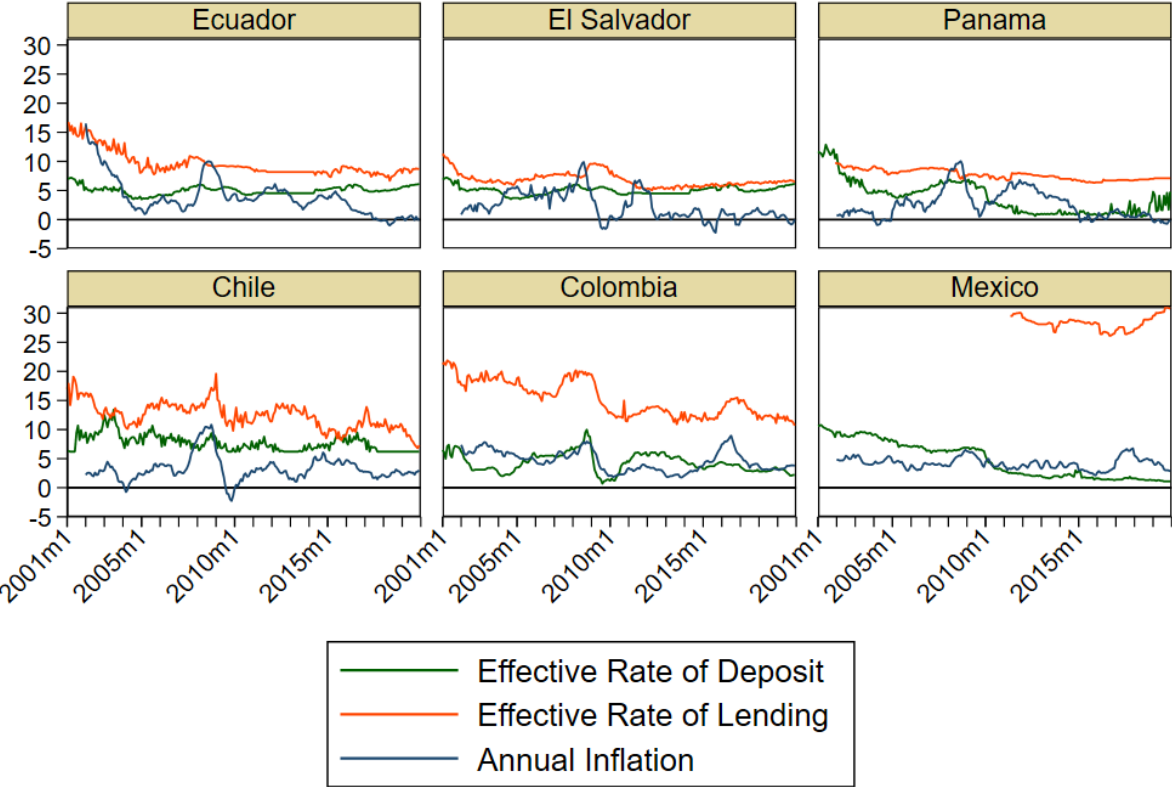
Graphs by country2

Figure 2. Lending Rates, Fed Funds Rate, and U.S. Treasury Yields (percent)



Graphs by country2

Figure 3. Deposit Rates, Lending Rates, and Inflation (percent)



Graphs by country2

Figure 4. Deposit Rates, Lending Rates, and Economic Activity

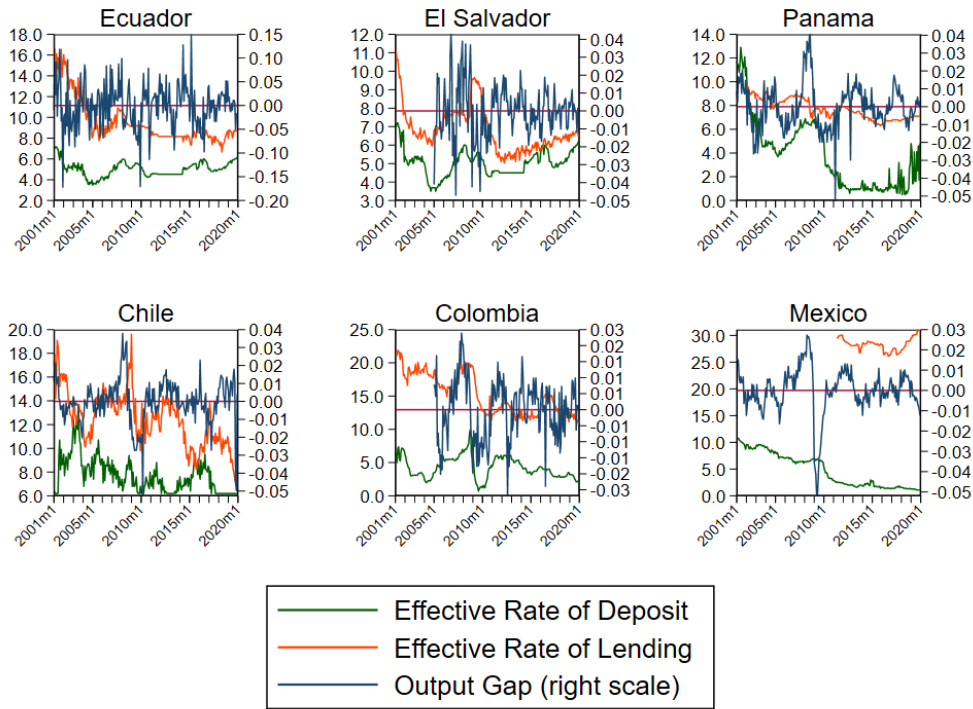


Figure 5. Deposit Rates, Lending Rates, and EMBI

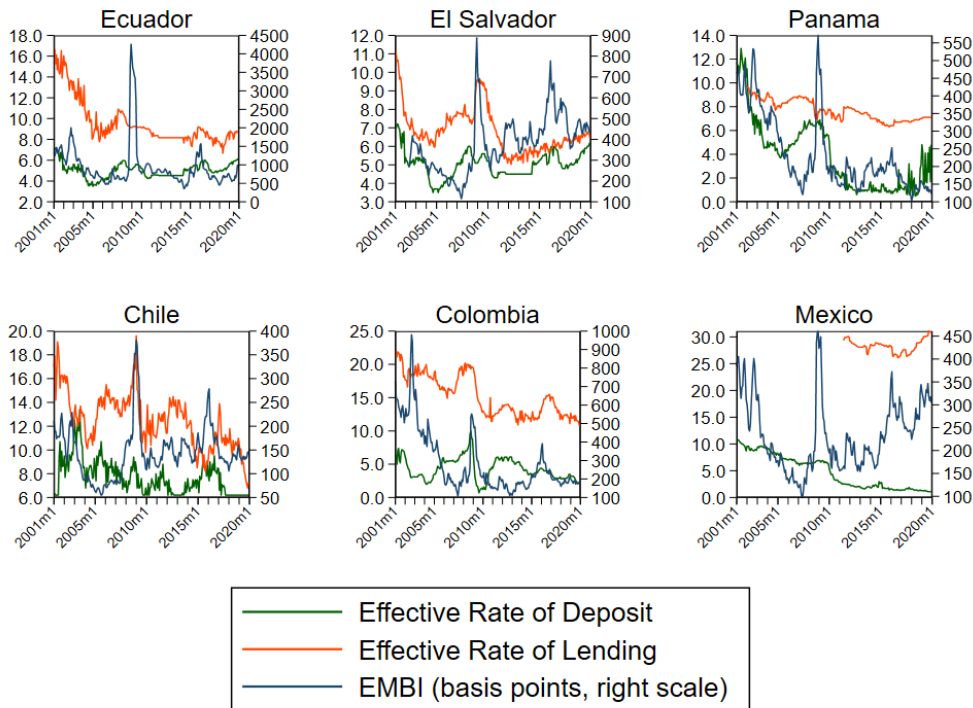


Table 1: Estimation Results for Dollarized Economies: Deposit Rates

Ecuador	Effective Rate of Deposit						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.74 (0.78)		0.93** (0.43)	0.77** (0.38)	0.94** (0.41)	0.94** (0.42)	0.80** (0.34)
10 yr. U.S. Treasury Yield		-0.36 (0.35)	-1.37** (0.58)	-0.89 (0.64)	-1.39** (0.57)	-1.40** (0.58)	-1.14** (0.45)
Time Trend				0.01 (0.01)			
Inflation					0.06 (0.11)	0.06 (0.11)	-0.1 (0.13)
Output Gap						0.59 (5.57)	2.48 (5.25)
EMBI Spread							0.00** 0.00
Adjustment Factor	-0.03 (0.02)	-0.04* (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)
R2	0.12	0.1	0.18	0.18	0.18	0.18	0.22
p- value for cointegration IO variables	0.15	0.55	0	0	0	0	0
p-value for I1 variables	0.24	0.67	0	0.01	0.01	0.03	0.02
Estimation Period	2001m1- 2019m12	2001m1- 2019m12	2001m1- 2019m12	2001m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

Note: Coefficients based on ARDL regressions in an error correction form (see equation 1). Standard errors are in parenthesis. Coefficients indicate the long-term impact of changes in the lagged level of the variable. For example, a coefficient of .94 indicates that a 1 percent increase in the Fed funds rate will raise deposit rates by 0.94 percent in the long run. Short term coefficients (lagged differences) are not shown in the interest of brevity.

El Salvador	Effective Rate of Deposit						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.39 (0.27)		0.65** (0.30)	0.60** (0.30)	0.65** (0.30)	0.59** (0.24)	0.55*** (0.18)
10 yr. U.S. Treasury Yield		0.05 (0.35)	-0.84* (0.43)	-0.67 (0.55)	-0.77* (0.43)	-0.59 (0.38)	-0.23 (0.29)
Time Trend				0 (0.01)			
Inflation					-0.05 (0.10)	-0.05 (0.09)	-0.06 (0.07)
Output Gap						-1.17 (13.96)	2.04 (10.83)
EMBI Spread							0.00* (0.00)
Adjustment Factor	-0.04* (0.02)	-0.04 (0.02)	-0.05** (0.02)	-0.06** (0.02)	-0.05** (0.02)	-0.06** (0.03)	-0.08*** (0.03)
R2	0.04	0.02	0.08	0.08	0.08	0.07	0.09
p- value for cointegration 10 variables	0.12	0.63	0.02	0.09	0.04	0.14	0.07
p-value for l1 variables	0.2	0.74	0.07	0.19	0.14	0.42	0.33
Estimation Period	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12

Panama	Effective Rate of Deposit						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	1.39*** (0.40)		2.43 (1.57)	2.36 (1.43)	2.37 (1.53)	2.06 (1.28)	1.66** (0.64)
10 yr. U.S. Treasury Yield		1.17* (0.68)	-1.62 (2.13)	-1.89 (2.21)	-1.56 (2.07)	-1.05 (1.72)	-0.86 (0.94)
Time Trend				-0.01 (0.02)			
Inflation					0.06 (0.30)	-0.11 (0.32)	0.02 (0.18)
Output Gap						89.07 (73.38)	43.23 (38.47)
EMBI Spread							0.01** (0.01)
Adjustment Factor	-0.08*** (0.02)	-0.07** (0.03)	-0.06* (0.03)	-0.06* (0.03)	-0.06* (0.03)	-0.06* (0.03)	-0.11*** (0.04)
R2	0.31	0.27	0.32	0.32	0.32	0.32	0.34
p- value for cointegration IO variables	0	0.36	0	0.02	0.01	0.01	0
p-value for I1 variables	0.01	0.49	0.02	0.06	0.04	0.05	0.03
Estimation Period	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

Note: Coefficients based on ARDL regressions in an error correction form (see equation 1). Standard errors are in parenthesis. Coefficients indicate the long-term impact of changes in the lagged level of the variable. For example, a coefficient of .94 indicates that a 1 percent increase in the Fed funds rate will raise deposit rates by 0.94 percent in the long run. Short term coefficients (lagged differences) are not shown in the interest of brevity.

Table 2: Estimation Results for Non-Dollarized Economies: Deposit Rates

Chile	Effective Rate of Deposit						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.13 (0.21)		-0.14 (0.25)	-0.04 (0.25)	-0.24 (0.23)	-0.32 (0.26)	-0.49* (0.29)
10 yr. U.S. Treasury Yield		0.49* (0.29)	0.64 (0.39)	0.19 (0.62)	0.74** (0.36)	0.84** (0.40)	0.61 (0.41)
Time Trend				-0.01 (0.01)			
Inflation					0.25* (0.13)	0.21 (0.14)	0.43** (0.20)
Output Gap						25.96 (28.14)	13.28 (27.82)
EMBI Spread							-0.01 (0.01)
Adjustment Factor	-0.13*** (0.04)	-0.15*** (0.04)	-0.15*** (0.04)	-0.17*** (0.05)	-0.17*** (0.04)	-0.16*** (0.04)	-0.16*** (0.04)
R2	0.39	0.4	0.4	0.4	0.41	0.41	0.42
p- value for cointegration IO variables	0.01	0.01	0.01	0.04	0	0.01	0
p-value for I1 variables	0.03	0.01	0.04	0.1	0.02	0.04	0.04
Estimation Period	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

Colombia	Effective Rate of Deposit						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.53 (0.32)		0.22 (0.46)	0.42 (0.36)	0.15 (0.55)	-0.12 (0.45)	-1.33*** (0.39)
10 yr. U.S. Treasury Yield		1.03* (0.59)	0.73 (0.83)	-0.5 (0.93)	0.94 (0.97)	0.81 (0.70)	2.08*** (0.58)
Time Trend				-0.02 (0.01)			
Inflation					-0.11 (0.41)	0.01 (0.28)	1.48*** (0.33)
Output Gap						136.13** (58.19)	14.75 (36.60)
EMBI Spread							-0.05*** (0.01)
Adjustment Factor	-0.05*** (0.02)	-0.05*** (0.02)	-0.05*** (0.02)	-0.07*** (0.02)	-0.04** (0.02)	-0.06*** (0.02)	-0.08*** (0.02)
R2	0.29	0.29	0.29	0.3	0.3	0.33	0.51
p- value for cointegration I0 variables	0.04	0.03	0.05	0.11	0.13	0.02	0
p-value for I1 variables	0.07	0.05	0.13	0.21	0.35	0.1	0
Estimation Period	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12

Mexico	Effective Rate of Deposit						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	1.12 (0.80)		2.35 (4.38)	0.94 (1.01)	0.73 (0.58)	0.73 (0.59)	0.38* (0.22)
10 yr. U.S. Treasury Yield		1.12 (1.48)	-2.34 (7.85)	-1.13 (2.16)	-0.85 (1.32)	-0.86 (1.35)	0.05 (0.51)
Time Trend				-0.04* (0.02)	-0.04*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)
Inflation					0.78 (0.51)	0.78 (0.55)	0.46* (0.23)
Output Gap						0.89 (44.73)	14.07 (21.59)
EMBI Spread							0.01*** (0.00)
Adjustment Factor	-0.01** (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.02)	-0.03* (0.02)	-0.03 (0.02)	-0.08*** (0.03)
R2	0.06	0.06	0.06	0.07	0.08	0.08	0.13
p- value for cointegration I0 variables	0.4	0.6	0.5	0.74	0.56	0.66	0.14
p-value for I1 variables	0.53	0.72	0.72	0.88	0.81	0.9	0.46
Estimation Period	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

Note: Coefficients based on ARDL regressions in an error correction form (see equation 1). Standard errors are in parenthesis. Coefficients indicate the long-term impact of changes in the lagged level of the variable. For example, a coefficient of .94 indicates that a 1 percent increase in the Fed funds rate will raise deposit rates by 0.94 percent in the long run. Short term coefficients (lagged differences) are not shown in the interest of brevity.

Note: Results for Mexico include monthly dummies to control for seasonality.

Table 3: Estimation Results for Dollarized Economies: Lending Rates

Ecuador	Effective Rate of Lending						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.37* (0.19)		0.34 (0.31)	0.36 (0.29)	0.43 (0.27)	0.44 (0.27)	0.44 (0.28)
10 yr. U.S. Treasury Yield		0.47* (0.25)	0.06 (0.48)	-0.2 (0.62)	0 (0.41)	0.01 (0.40)	0.03 (0.41)
Time Trend				-0.01 (0.01)			
Inflation					0.18* (0.10)	0.18* (0.10)	0.14 (0.12)
Output Gap						-1.95 (4.90)	-1.28 (5.13)
EMBI Spread							0 0.00
Adjustment Factor	-0.11*** (0.03)	-0.13*** (0.03)	-0.12*** (0.04)	-0.13*** (0.04)	-0.14*** (0.04)	-0.15*** (0.04)	-0.14*** (0.04)
R2	0.25	0.24	0.25	0.25	0.41	0.42	0.42
p- value for cointegration I0 variables	0	0.01	0.01	0.03	0	0	0
p-value for I1 variables	0.01	0.01	0.02	0.07	0.01	0.03	0.05
Estimation Period	2001m1- 2019m12	2001m1- 2019m12	2001m1- 2019m12	2001m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

El Salvador	Effective Rate of Lending						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.36 (0.26)		0.58 (0.64)	0.53 (0.65)	0.4 (0.44)	0.23 (0.37)	0.31* (0.18)
10 yr. U.S. Treasury Yield		0.43 (0.73)	-0.46 (1.18)	-0.19 (1.35)	-0.13 (0.87)	-0.14 (0.83)	1.37*** (0.32)
Time Trend				0.01 (0.02)			
Inflation					0.15 (0.23)	0.13 (0.20)	-0.06 (0.08)
Output Gap						-18.54 (27.95)	-11.84 (13.25)
EMBI Spread							0.01*** 0.00
Adjustment Factor	-0.04** (0.02)	-0.03 (0.02)	-0.04* (0.02)	-0.04 (0.02)	-0.05** (0.02)	-0.05** (0.03)	-0.11*** (0.03)
R2	0.13	0.06	0.13	0.13	0.19	0.19	0.3
p- value for cointegration I0 variables	0.21	0.72	0.29	0.64	0.17	0.27	0
p-value for I1 variables	0.31	0.82	0.51	0.81	0.42	0.62	0
Estimation Period	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12	2005m1- 2019m12

Panama	Effective Rate of Lending						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.32** (0.14)		0.18 (0.15)	0.26*** (0.07)	0.26*** (0.07)	0.28*** (0.08)	0.29*** (0.09)
10 yr. U.S. Treasury Yield		0.51*** (0.18)	0.32 (0.25)	-0.27 (0.18)	-0.27 (0.19)	-0.31 (0.20)	-0.31 (0.21)
Time Trend				-0.01*** 0.00	-0.01*** 0.00	-0.01*** 0.00	-0.01*** 0.00
Inflation					0 (0.03)	0.02 (0.04)	0.02 (0.04)
Output Gap						-11.38 (8.42)	-12.41 (9.11)
EMBI Spread							0 0.00
Adjustment Factor	-0.06*** (0.02)	-0.07*** (0.03)	-0.08*** (0.03)	-0.17*** (0.04)	-0.17*** (0.04)	-0.16*** (0.04)	-0.15*** (0.04)
R2	0.04	0.04	0.04	0.09	0.09	0.11	0.11
p- value for cointegration I0 variables	0.11	0.12	0.12	0.01	0.02	0.01	0.02
p-value for I1 variables	0.18	0.2	0.27	0.03	0.07	0.07	0.12
Estimation Period	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

Note: Coefficients based on ARDL regressions in an error correction form (see equation 1). Standard errors are in parenthesis. Coefficients indicate the long-term impact of changes in the lagged level of the variable. For example, a coefficient of .94 indicates that a 1 percent increase in the Fed funds rate will raise deposit rates by 0.94 percent in the long run. Short term coefficients (lagged differences) are not shown in the interest of brevity.

Table 4: Estimation Results for Non-Dollarized Economies: Lending Rates

Chile	Effective Rate of Lending						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	0.75 (0.70)		0.1 (0.76)	0.5 (0.59)	0.14 (0.45)	-0.16 (0.51)	-0.26 (0.60)
10 yr. U.S. Treasury Yield		1.43 (0.91)	1.32 (1.22)	-0.89 (1.43)	-0.23 (1.10)	0.24 (1.20)	0.18 (1.27)
Time Trend				-0.03* (0.02)	-0.03* (0.01)	-0.02 (0.02)	-0.02 (0.02)
Inflation					0.60** (0.25)	0.47* (0.25)	0.58 (0.39)
Output Gap						85.46 (54.30)	84.35 (57.12)
EMBI Spread							-0.01 (0.02)
Adjustment Factor	-0.06* (0.03)	-0.07* (0.04)	-0.07* (0.04)	-0.10** (0.04)	-0.13*** (0.04)	-0.12*** (0.04)	-0.12*** (0.04)
R2	0.11	0.11	0.11	0.12	0.16	0.17	0.17
p- value for cointegration 10 variables	0.51	0.37	0.51	0.58	0.12	0.06	0.08
p-value for l1 variables	0.64	0.5	0.72	0.76	0.3	0.21	0.32
Estimation Period	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12	2002m1- 2019m12

Colombia	Effective Rate of Lending						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	1.26*** (0.45)		0.69 (0.77)	1.45** (0.58)	0.51** (0.21)	0.85*** (0.24)	0.77*** (0.27)
10 yr. U.S. Treasury Yield		2.03** (0.84)	1.11 (1.26)	-1.63 (1.24)	-0.32 (0.48)	-0.56 (0.47)	-0.47 (0.50)
Time Trend				-0.03* (0.02)	-0.03*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)
Inflation					0.89*** (0.13)	0.89*** (0.13)	1.03*** (0.21)
Output Gap						-2.53 (24.39)	-8.12 (26.06)
EMBI Spread							0 0.00
Adjustment Factor	-0.07*** (0.02)	-0.06*** (0.02)	-0.06*** (0.02)	-0.09*** (0.03)	-0.22*** (0.04)	-0.22*** (0.04)	-0.22*** (0.04)
R2	0.15	0.22	0.23	0.17	0.28	0.3	0.31
p- value for cointegration 10 variables	0.03	0.12	0.15	0.09	0	0	0
p-value for 11 variables	0.06	0.2	0.31	0.19	0	0	0
Estimation Period	2005m1-2019m12	2005m1-2019m12	2005m1-2019m12	2005m1-2019m12	2005m1-2019m12	2005m1-2019m12	2005m1-2019m12

Mexico	Effective Rate of Lending						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fed Funds Effective Rate	2.3 (1.57)		1.22** (0.53)	2.02** (0.81)	1.22** (0.54)	1.11** (0.49)	3.96 (3.34)
10 yr. U.S. Treasury Yield		9.18 (19.01)	1.96* (1.17)	1.58* (0.92)	1.96 (1.19)	2.29* (1.2)	3.06 (2.61)
Time Trend				-0.03 (0.02)			
Inflation					0.03 (0.38)	0.01 (0.35)	-2.08 (1.82)
Output Gap						104.99 (77.48)	97.56 (75.19)
EMBI Spread							-0.03 (0.03)
Adjustment Factor	-0.05 (0.04)	-0.02 (0.04)	-0.11** (0.05)	-0.13*** (0.05)	-0.11** (0.05)	-0.12** (0.05)	-0.37 (0.31)
R2	0.17	0.15	0.27	0.28	0.27	0.29	0.98
p- value for cointegration I0 variables	0.21	0.46	0.02	0.06	0.04	0.03	-
p-value for I1 variables	0.32	0.6	0.08	0.14	0.17	0.17	-
Estimation Period	2011m5- 2019m12	2011m5- 2019m12	2011m5- 2019m12	2011m5- 2019m12	2011m5- 2019m12	2011m5- 2019m12	2011m5- 2019m12

Note: Coefficients based on ARDL regressions in an error correction form (see equation 1). Standard errors are in parenthesis. Coefficients indicate the long-term impact of changes in the lagged level of the variable. For example, a coefficient of .94 indicates that a 1 percent increase in the Fed funds rate will raise deposit rates by 0.94 percent in the long run. Short term coefficients (lagged differences) are not shown in the interest of brevity.

Note: Results for Mexico include monthly dummies to control for seasonality.

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Appendix: Data Sources

Variable	Country	Source	Notes
Effective Rate of Deposits	Chile	Central Bank of Chile– CEPAL	Average deposit rates of the financial system, nominal, 90 days to 1 year
	Colombia	Central Bank of Colombia– CEPAL	Monthly weighted average of the rate for 90-day term deposit certificates
	Mexico	Central Bank of Mexico– CEPAL	Cost of multiple bank term deposits
	Ecuador	Central Bank of Ecuador– CEPAL	Reference deposit rate
	El Salvador	Central Reserve Bank of El Salvador	Basic deposit rate up to 1 year
	Panama	CEPAL	6-month deposit rate
Effective Rate of Lending	Chile	Central Bank of Chile– CEPAL	Active rates, 90-360 days, non-adjustable operations
	Colombia	Central Bank of Colombia– CEPAL	Total B. R. active rate of the system
	Mexico	Central Bank of Mexico– CEPAL	Nominal active interest rate (weighted average rate of private debt placements, with a term of up to one year, expressed in a 28-day curve. Includes only stock certificates)
	Ecuador	Central Bank of Ecuador– CEPAL	Reference rate
	El Salvador	Central Reserve Bank of El Salvador	Basic rate up to 180 days
	Panama	CEPAL	Interest rate on 1-year trade credit (nominal active rate)
Federal Funds Effective Rate	United States	Federal Reserve Economic Data, Federal Bank of St. Louis and US.	
10-Year US Treasury Yield	United States	Federal Reserve Economic Data, Federal Bank of St. Louis and US.	Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis
Inflation (Consumer Price Index)	Chile	National Institute of Statistics (INE) and CEPAL	
	Colombia	National Administrative Department of Statistics (DANE) and CEPAL	
	Mexico	CEPAL and CEIC	
	Ecuador	INEC and CEPAL	
	El Salvador	CEPAL	
	Panama	CEPAL	
Economic Activity Index	Chile	Central Bank of Chile	HP filters applied to these indexes to calculate trend levels; output gaps were calculated as the difference between actual indexes and their trends.
	Colombia	Central Bank of Colombia	
	Mexico	Central Bank of Mexico	
	Ecuador	Central Bank of Ecuador	
	El Salvador	Central Reserve Bank of El Salvador	
	Panama	National Institute of Statistics and Census (INEC), Panama	
EMBI	All six	Central Reserve Bank of Peru	Main country risk indicator calculated by J.P. Morgan Chase

Notes: CEPAL refers to the *Comisión Económica para América Latina (Economic Commission for Latin America)*.