U.S. Monetary Policy Shocks and Bank Lending in Latin America: Evidence of an International Bank Lending Channel

Working paper

September 2023

Carlos Giraldo
Iader Giraldo-Salazar
Jose E. Gomez-Gonzalez
Jorge M. Uribe

FLAR
FONDO LATINOAMERICANO DE RESERVAS

U.S. Monetary Policy Shocks and Bank Lending in Latin America: Evidence of an International Bank Lending Channel*

Carlos Giraldo **
Iader Giraldo ***
Jose E. Gomez-Gonzalez ****
Jorge M. Uribe *****

Abstract

We examine the impact of U.S. monetary policy shocks on bank lending in five major Latin American countries where large U.S. banks have limited presence. Our analysis covers annual balance sheet data from 2000 to 2021 for all banks in these nations, utilizing a recently developed measure of U.S. monetary policy shocks by Bu et al. (2021). Our findings reveal the existence of an international bank lending channel, with a one-percentage-point increase in the Fed funds rate resulting in an average 80.6 basis- point reduction in domestic bank loan growth in these countries. Liquidity and solvency emerge as crucial factors driving variations in lending behavior among Latin American banks, with banks exhibiting stronger liquidity and solvency profiles experiencing higher loan supply growth rates. This international bank lending channel persists even in countries with minimal U.S. bank presence, leading to constrained cross-border lending activities.

Key Words: International bank lending channel; U.S. Monetary policy shocks; loan growth; Latin America.

JEL Classifications: E5, E52, E59, G21

---

* The opinions in this paper are those of the authors and do not commit FLAR or its directory board.

** Latin American Reserve Fund, Bogotá, Colombia. Email: cgiraldo@flar.net

*** Latin American Reserve Fund, Bogotá, Colombia. Email: igiraldo@flar.net

**** Department of Finance, Information Systems, and Economics, City University of New York – Lehman College, Bronx, NY, 10468, USA Email: jose.gomezgonzalez@lehman.cuny.edu

***** Faculty of Economics and Business, Universitat Oberta de Catalunya, Barcelona, Spain. Email: juribeg@uoc.edu

Table of contents

1. Introduction

In our deeply interconnected global financial landscape, the decisions made by central banks wield significant influence that extends far beyond the confines of national borders. Specifically, monetary policy exerts considerable influence over both local and global financial markets, affecting critical factors such as interest rates, asset values, and the availability of credit. These financial dynamics, in turn, ripple through the broader real economy.

The extensive literature on the bank lending channel and the risk-taking channel of monetary policy has consistently demonstrated the pivotal role played by banks and their financial characteristics in transmitting the monetary policies of local central banks (Gambacorta, 2005; Disyatat, 2011; Kishan and Opiela, 2012; Altunbas et al., 2014; Gambacorta and Shin, 2018; Gomez-Gonzalez et al., 2021).

Considerably less attention has been directed toward investigating the existence of an international bank lending channel. Only a few recent papers have shifted their focus toward a more nuanced comprehension of how monetary policy shapes the provision of credit to foreign borrowers. This shift in focus has mainly been a response to the rise of global banks. Recent empirical studies have unveiled that globally active U.S. banks serve as active conduits for transmitting monetary policy shocks to other nations. Their strategic responses to these shocks have discernible implications, notably in the distribution of bank claims between the United States and foreign countries. As a result, the effects of U.S. monetary policy ripple across the global stage, offering benefits to recipient economies (Cetorelli and Goldberg, 2012; Temesvary et al., 2018; Lee et al., 2022).

This body of literature underscores the significance of global banks, given their notable impact on cross-border flows to lower-income countries in response to shifts in U.S. monetary policy. Nevertheless, these investigations have primarily concentrated on countries where global U.S. banks actively participate in credit provision. Limited attention has been devoted to examining how U.S. monetary policy shocks are transmitted to countries where the presence of global U.S. banks is minimal or nonexistent. There are compelling reasons to suspect that U.S. monetary policy shocks also influence bank lending in these cases, particularly when considering small, open, emerging market economies such as those in Latin America. First, this is because central banks in these countries often react to shifts in U.S. policy interest rates (Huertas, 2022). Consequently, U.S. monetary policy shocks can influence local bank lending channels. Furthermore, alterations in U.S. interest rates impact worldwide capital flows, subsequently influencing exchange rates and asset prices, such as housing prices. These, in turn, have implications for the propensity to engage in borrowing and lending within credit markets.

In this paper, we investigate the propagation of U.S. monetary policy shocks to bank lending within five of the largest Latin American nations. Notably, the presence of large international banks, particularly those from the United States, is limited in these five countries. That is, their financial systems primarily comprise domestic banks. We utilize annual balance sheet data encompassing all banks operating in these five countries, spanning from 2000 to 2021. We utilize the recently developed measure of U.S. monetary policy shocks introduced by Bu et al. (2021).

Our results indicate the existence of an international bank lending channel extending from the U.S. to the five major Latin American countries. Specifically, on average, a one-percentage- point increase in the Fed funds rate leads to an 80.6 basis-point reduction in the growth rate of loans extended by banks. Parallel to findings in studies concerning the conventional local bank lending channel, liquidity and solvency emerge as pertinent factors elucidating disparities in bank lending practices across Latin American banks. As anticipated, banks with greater liquidity and solvency profiles tend to exhibit higher rates of loan supply growth.

Our findings demonstrate the presence of an international bank lending channel, even in countries where the presence of U.S. banks is minimal, leading to constrained cross-border bank lending activities. Although the examination of transmission channels falls beyond the purview of this paper, it is plausible that these channels could be linked to the reactions of local commercial banks to U.S. monetary policy innovations. Upon the emergence of a positive U.S. monetary policy shock, local bankers develop expectations that their domestic central banks will react in a commensurate manner. Consequently, they anticipate and respond to these expectations by restraining lending activities. Crucially, our chosen shock measure is entirely exogenous to other relevant factors in the global economy, allowing us to address the direct transmission through the bank-lending channel, devoid of the influence of financial and real uncertainty shocks.

2. Data and Methodology

We use a database composed of relevant variables from commercial banks'; balance sheets in five major Latin American economies: Brazil, Chile, Colombia, Mexico, and Peru. In this database, provided by S&P Capital I.Q., the balance sheets collect data in a standardized manner and present the data in millions of U.S. dollars. It contains data on 114 banks, with 32 from Brazil, 16 from Chile, 19 from Colombia, 27 from Mexico, and 20 from Peru. Following the literature on the bank lending channel, we gathered information on total gross loans, solvency ratio, liquidity, and the size of each of these banks. Due to the lack of information on technical equity and risk-weighted assets, we constructed solvency as the ratio between total equity and total assets for each bank, following the customary approach in the related literature. The liquidity ratio was constructed as the ratio between liquid assets and short-run liabilities for each bank. Size corresponds to the natural logarithm of total assets.

Our objective is to assess the impact of monetary policy shocks in the United States on the growth of the gross loan portfolio of banks in the region. To achieve this, we utilize a recently developed measure of U.S. monetary policy shocks introduced by Bu et al. (2021). Their method combines partial least squares, accounting for heteroscedasticity, with Fama-MacBeth- style regressions. This approach is tailored to identify a series of U.S. monetary policy shocks that effectively span both conventional and unconventional policy periods while reducing the influence of central bank information. Importantly, it represents an enhancement compared to previous measures.

Table 1 presents descriptive statistics of the bank-specific variables utilized in this study. It is evident that the average annual growth rate of gross loans in the five countries is notably robust, consistently exceeding 10% across the board. Furthermore, substantial disparities are observable, with Mexican banks exhibiting a gross loan growth rate more than double that of their Colombian counterparts. The control variables

display significant heterogeneity as well. On average, Chilean banks appear larger but less solvent than their counterparts in other countries. Conversely, Colombian banks exhibit notably lower liquidity levels compared to their peers in the dataset.

Initial analyses revealed a negative correlation between loan growth rates in the five countries and the Fed funds rate, with the correlation being most pronounced (in absolute terms) for Brazil, Chile, and Colombia (see Figure 1 and Table 2). These results present compelling evidence that suggests a connection between U.S. monetary policy and bank loans in Latin American countries. However, traditional monetary theory argues that only unanticipated monetary shocks have an impact on loan growth rates. Furthermore, note that the correlations presented in Table 2 are derived from aggregate data, while our main interest lies in analyzing the influence of U.S. monetary policy shocks on the loan growth rates of individual banks.

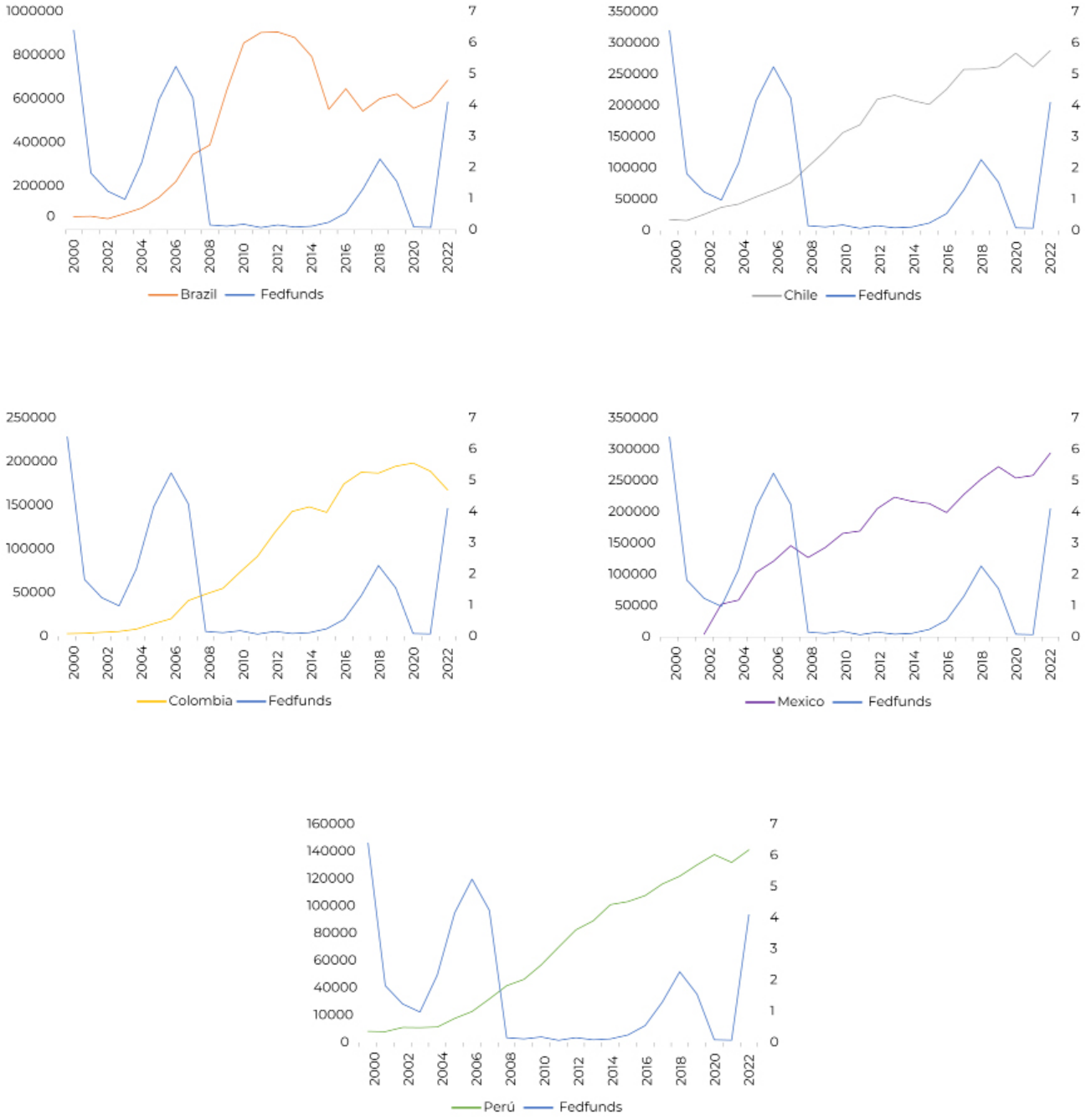
Figure 2 shows the time series of the U.S. monetary policy shock variable used in this study. While both positive (contractionary) and negative (expansionary) shocks are clearly observed, the Fed systematically generated expansionary monetary surprises during the financial crisis of 2008-10 and in several subsequent periods as a strategy to help the U.S. economy recover.

Table 1. Descriptive Statistics of Bank-Specific Variables by Country 2000-2020

Variable	Mean	Standard Deviation	Minimum	Maximum
		Brazil		
LoanGrowth	17.37%	87.28%	-98.29%	1802.78%
Solvency	13.79%	13.87%	0.16%	96.68%
Liquidity	70.25%	564.74%	0.02%	11456.13%
Size	8.84	1.86	5.03	13.24
		Chile		
LoanGrowth	20.72%	94.52%	-40.39%	1325.07%
Solvency	9.29%	5.06%	3.8%	47.3%
Liquidity	38.18%	25.07%	6.36%	173.02%
Size	9.24	1.39	5.24	11.43
		Colombia		
LoanGrowth	10.40%	23.82%	-47.45%	195.27%
Solvency	12.42%	5.27%	5.70%	46.91%
Liquidity	27.51%	13.35%	0.27%	93.04%
Size	8.12	1.73	3.93	11.22
		Mexico		
LoanGrowth	28.38%	242.70%	-40.39%	4382.30%
Solvency	14.97%	13.69%	1.14%	98.30%
Liquidity	971.13%	10225.82%	-24.33%	172197.60%
Size	8.43	1.95	2.19	11.86
		Peru		
LoanGrowth	16.51%	58.50%	-42.56	979.83
Solvency	14.83%	10.04%	2.11%	100%
Liquidity	168.08%	730.93%	2.39%	8795.45%
Size	7.49	1.72	2.16	11.09

Source: Own elaboration

Figure 1. Total Loans by Country and the Fed Funds Rate



Source: Own elaboration

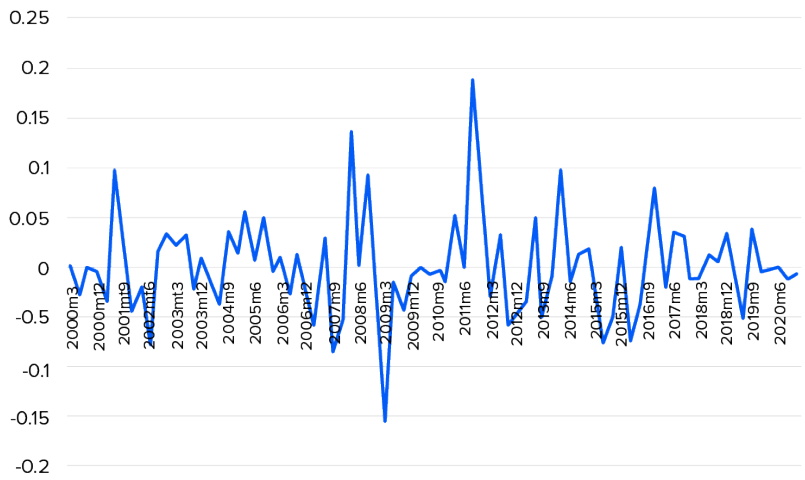
Table 2. Pairwise Correlations between Loan Growth by Country and Fed Funds Rate 2000-2022

Brazil	-0.56**
Chile	-0.42*
Colombia	-0.41*
Mexico	-0.16*
Peru	-0.38*

*Indicates correlation is significantly different from zero at the 5% level, while **indicates significance at the 1% level.

Source: Own elaboration

Figure 2. U.S. Monetary Policy Shock 2000-2020



Source: Own elaboration

Our baseline empirical model is represented by the following equation:

$$LoanGrowth_{it} = \beta_0 + \beta_1 LoanGrowth_{i,t-1} + \Gamma X_{it} + \alpha_1 BRWShock_t + \varepsilon_{it} \quad (1)$$

where $LoanGrowth_{it}$ stands for the annual growth rate of gross loans of bank i at time t, $\boldsymbol{X}_{it}$ is a vector of all bank-specific covariates (solvency, liquidity and size) of bank i at time t, $BRWShock_t$ stands for the U.S. monetary policy shock at time t, and $\boldsymbol{\mathcal{E}}_{it}$ is an idiosyncratic disturbance term. Our primary interest lies in examining the sign and statistical significance of all the respective parameters in our analysis. However, particular attention is devoted to the parameter denoted as α_1, which corresponds to the U.S. monetary policy shock variable. Our expectation is for the parameter value to be negative and statistically significant, indicating that a positive

(negative) U.S. monetary policy shock leads to lower (higher) gross loan growth rates, holding all other factors constant. Under alternative empirical specifications, we include a dummy variable that takes value one when bank *i* is domestic and zero otherwise and country-fixed effects that control for the heterogeneity observed among banks from different countries. This heterogeneity may partially derive from differences in regulation and market size between countries. We estimate a dynamic panel data model, as bank loan growth reports considerable inertia (see, for instance, Gomez-Gonzalez et al., 2021).

3. Results

We estimate Equation (1) using a linear dynamic panel-data model that incorporates unobserved panel-level effects that exhibit correlations with the lags of the dependent variable (Arellano-Bover/ Blundell-Bond system estimator). The main results are shown in Table 3.

Table 3. Empirical Results. Dependent Variable is Bank Gross Loan Growth Rate

Predictors	(1)	(2)	(3)
Lagged LoanGrowth	0.022** (0.011)	0.021* (0.011)	0.023** (0.011)
BRWShock	-0.806** (0.334)	-0.796*** (0.283)	-0.931*** (0.349)
Solvency	0.015 (0.011)	0.014*** (0.005)	0.017 (0.010)
Liquidity	0.003*** (0.000)	0.004* (0.002)	0.005*** (0.001)
Size	0.037 (0.060)	0.028 (0.029)	0.044 (0.074)
DDomestic		0.196 (0.138)	0.163 (0.399)
DBrazil			0.359 (0.261)
DChile			-0.243 (0.469)
DColombia			-0.358 (0.931)
DMexico			0.734 (0.475)
Wald test	20.04	23.88	32.07
P-value WT	0.001	0.000	0.000
Observations	998	998	998

Note: Standard errors in parentheses. *** indicates p-value is less than 0.01; ** indicates p-value is greater than 0.01 but less than 0.05; * indicates p-value is greater than 0.05 but less than 0.1

The results from all model specifications consistently provide strong evidence for the presence of an international bank-lending channel through which the Federal Reserve's monetary policy affects banks in Latin America. Specifically, positive (negative) surprises in U.S. monetary policy result in reductions in Latin American banks' gross loan growth rates. In our baseline model (Model (1)), excluding dummy variables, a one-point increase in the monetary policy shock variable leads to an 80.6-basis-point reduction in the average bank gross loan growth rate. This effect is slightly more pronounced when country-specific dummy variables are incorporated.

Notably, while average values of bank-specific variables exhibit substantial variations within countries, country fixed effects do not reach statistical significance at conventional levels in the specifications where they are incorporated. This observation likely suggests that the diversity among banks within individual countries is more pronounced than the disparities between countries.

The results suggest no statistically significant differences in gross loan growth rates between national and foreign banks. This outcome may be attributed to the limited presence of international banks in these five Latin American countries, with very few, if any, having a parent bank based in the United States.

In the context of the dynamic panel data model employed in this paper, it is essential to note that the moment conditions hold true exclusively when there is an absence of serial correlation in the idiosyncratic errors. Due to the autocorrelation present in the first differences of independently and identically distributed idiosyncratic errors, note that rejecting the null hypothesis of no serial correlation at the first order in these first-differenced errors does not necessarily indicate model misspecification. However, rejecting the null hypothesis at higher orders does suggest that the moment conditions are no longer valid. Tests for zero autocorrelation in first-differenced errors do not present evidence of misspecification in our models, as shown in Table 4.

Table 4. Test for zero autocorrelation in first-differenced errors

Order	Model (1)	Model (2)	Model (3)
First	-4.664	-4.664	-4.664
	(0.000)	(0.000)	(0.000)
Second	0.067	0.067	0.067
	(0.947)	(0.947)	(0.947)

Note: P-values in parentheses.

In line with studies focused on the local bank lending channel, our findings underscore the significance of bank-specific variables. Specifically, banks with greater liquidity exhibit higher loan growth rates than their less liquid counterparts. Furthermore, although the coefficients associated with solvency and size do not reach statistical significance using conventional significance levels, their positive signs align with the predictions of the bank lending channel theory, as proposed by Kishan and Opiela (2006).

4. Conclusions

We study the impact of U.S. monetary policy shocks on bank lending in five large Latin American countries. We use annual balance sheet data spanning from 2000 to 2020 for all banks operating in these countries and employ the newly developed U.S. monetary policy shock measure by Bu et al. (2021).

Our results confirm the existence of an international bank lending channel from the U.S. to these major Latin American countries. Specifically, on average, a one-percentage-point increase in the Fed funds rate leads to an 80.6 basis-point reduction in loan growth rates. Consistent with findings in studies on the local bank lending channel, liquidity and solvency are key factors explaining variations in bank lending practices across Latin American banks. As expected, banks with higher liquidity and solvency profiles tend to experience greater loan supply growth.

Our findings highlight the presence of an international bank lending channel, even in countries with limited U.S. bank presence, which constrains cross-border bank lending activities. Hence, our findings align with recent studies that underscore the transmission of monetary policy shocks from the U.S. to other countries, emphasizing the significant role played by cross- border lending by U.S. banks.

References

Altunbas, Y., Gambacorta, L. and Marquez-Ibañez, D. (2014). Does monetary policy affect bank risktaking? International Journal of Central Banking 10: 95-135.

Cetorelli, N. and Goldberg, L.S. (2012). Liquidity management of U.S. global banks: Internal capital markets in the great recession. Journal of International Economics 88: 299-311.

Disyatat, P. (2011). The Bank lending channel revisited. Journal of Money, Credit, and Banking 43: 711-734.

Gambacorta, L. (2005). Inside the bank lending channel. European Economic Review 49: 1737- 1759.

Gambacorta, L. and Shin, H.S. (2018). Why bank capital matters for monetary policy. Journal of Financial Intermediation 35: 27-39.

Gomez-Gonzalez, J.E., Kutan, A., Ojeda-Joya, J. and Ortiz, C. (2021). Does the financial structure of banks influence the bank lending channel of monetary policy? Evidence from Colombia. International Journal of Emerging Markets 16: 765-785.

Huertas, G. (2022). Why Follow the Fed? Monetary Policy in Times of U.S. Tightening. IMF Working Paper WP/22/243.

Kishan, R.P. and Opiela, T. (2012). Monetary policy, bank lending and the risk-pricing channel. Journal of Money, Credit, and Banking 44: 573-602.

Lee, S.J., Liu, L.Q. and Stebunovs, V. (2022). Risk-taking spillovers of U.S. monetary policy in the global market for U.S. dollar corporate loans. Journal of Banking and Finance 138: 105550.

Temesvary, J., Ongena, S. and Owen, A.L. (2018). A global lending channel unplugged? Does U.S. monetary policy affect cross-border and affiliate lending by global U.S. banks? Journal of International Economics 112: 50-69.

FLAR
FONDO LATINOAMERICANO DE RESERVAS

Fondo Latinoamericano de revervas I FLAR
Calle 84A No. 12-18 Piso 7 I Bogotá, Colombia
Correo electrónico: flar@flar.net
Tel: (571) 634 4360