



Economic Letter

VOL. 13, NO. 9 • DECEMBER 2018

Reserve Adequacy Explains Emerging-Market Sensitivity to U.S. Monetary Policy

by J. Scott Davis, Dan Crowley and Michael Morris

► **ABSTRACT:** Emerging economies that borrow in U.S. dollars are sensitive to U.S. monetary policy due to changing exchange rates. However, the marginal effect of this sensitivity is determined by the relative amount of U.S. dollars held in reserve.

Recent depreciation of the Turkish lira and Argentine peso have shaken investor confidence in emerging-market stability. Tightening U.S. monetary policy can lead to capital outflows from emerging economies and result in a stronger dollar as rates of return from foreign investments become less attractive.

Turkey suffered a rapid currency devaluation of 40 percent against the dollar from January to mid-September 2018. Similarly, Argentina's currency fell 53 percent over the same period. Both countries' expenditures have exceeded their income, and both have issued U.S. dollar-denominated debt to cover the difference.

The decision to borrow in dollars makes Turkey and Argentina more sensitive to U.S. monetary policy than countries that use debt issued in the local currency. Exchange rate movement becomes a key determinant of the cost of borrowing in foreign currency.

JPMorgan's Corporate Emerging Market Bond Index (CEMBI) tracks the weighted average yield for investment-grade U.S. dollar-denominated bonds. Chart 1 shows the CEMBI yield spread against the 10-year Treasury for Turkey, Argentina and an aggregate of other emerging econ-

omies. A higher spread indicates greater probable difficulty repaying debt.

Turkey has a large negative current account balance, a measure of the net national savings rate that includes the balance of trade, investment income and transfers. Turkey's current account deficit—6 percent of gross domestic product (GDP)—is one of the highest in the world. Furthermore, external debt (including government and private sector debt) totals 55 percent of GDP and is primarily denominated in foreign currency.

With its deep negative national savings rate and high debt levels, Turkey needs access to approximately \$200 billion a year to finance its maturing debts.¹ Because the debt is denominated in foreign currency, the weaker Turkish lira means it costs more in that local currency to repay the debt.

Argentina faces a similar challenge. The country's current account deficit totals approximately 5 percent of GDP. Foreign-currency-denominated debt amounts to nearly 40 percent of GDP, making it difficult to pay down the debt as the peso continues to weaken.

Due to tightening U.S. monetary policy, Turkey and Argentina face an increasingly large cost to finance their external

debt and counteract negative savings. Additionally, investors holding dollar-denominated bonds require higher yields because of the increased riskiness of lending to Turkish or Argentine public and private sector borrowers.

Measuring Reserve Adequacy

In this context, a simple way to view the current account is as the difference between a country's spending and its income. When the current account is in

deficit, the imbalance must be financed by issuing new external debt. The total stock of external debt is the legacy of past imbalances. A country's short-term foreign-currency-denominated external debt is debt in a foreign currency to be repaid or rolled over within the coming year.

In many emerging-market countries, financing current imbalances or the maturing legacy of past imbalances requires a stream of dollar financing. When the Federal Reserve tightens policy and with-

draws liquidity, dollar financing arrangements become more difficult. Borrowers in an emerging market must offer larger amounts of the domestic currency to obtain the same amount of dollar liquidity.

To guard against this external instability, central banks in emerging-market economies hold reserves—liquid foreign-currency-denominated assets. These reserves can provide foreign currency liquidity to domestic borrowers at times when it is hard to obtain from foreign lenders and, thus, stabilize the value of the local currency. Reserves are a safety net to guard against currency instability when major advanced-economy central banks tighten policy.

Emerging markets must decide what reserve level is adequate to protect their currency against swings in foreign monetary policy. Pablo Guidotti, a former deputy finance minister in Argentina, came to a conclusion later popularized by former Federal Reserve Chairman Alan Greenspan. In a 1999 speech to the World Bank, Greenspan summarized the rule stating “that countries should manage their external assets and liabilities in such a way that they are always able to live without new foreign borrowing for up to one year.”²

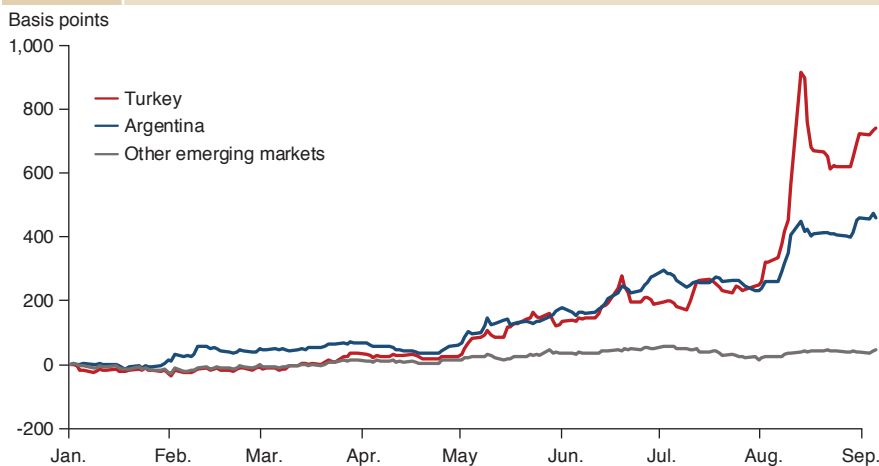
The rule suggests that emerging-market central banks should hold a stock of foreign currency assets equal to at least the sum of their short-term foreign-currency-denominated debt and the current account deficit. This leads to a simple measure of a central bank's reserve adequacy: foreign exchange reserves minus short-term foreign-currency-denominated external debt minus the current account deficit.

Regression analysis helps assess the reserve adequacy's effectiveness at buffering emerging markets against foreign monetary policy changes. Daily changes in the CEMBI spreads for a panel of 26 emerging-market economies are regressed on: a) daily changes in 12-month federal funds futures prices, b) a term interacting the fed funds futures price with a country's reserve adequacy and c) a dummy variable that allows the coefficient on the interaction term to change if reserve adequacy is below a particular threshold level.³

The interaction term allows the sensitivity of a country's CEMBI spread to changes in expected U.S. monetary policy to vary

CHART 1

CEMBI Spreads for Turkey, Argentina Widen Since Jan. 1, 2018

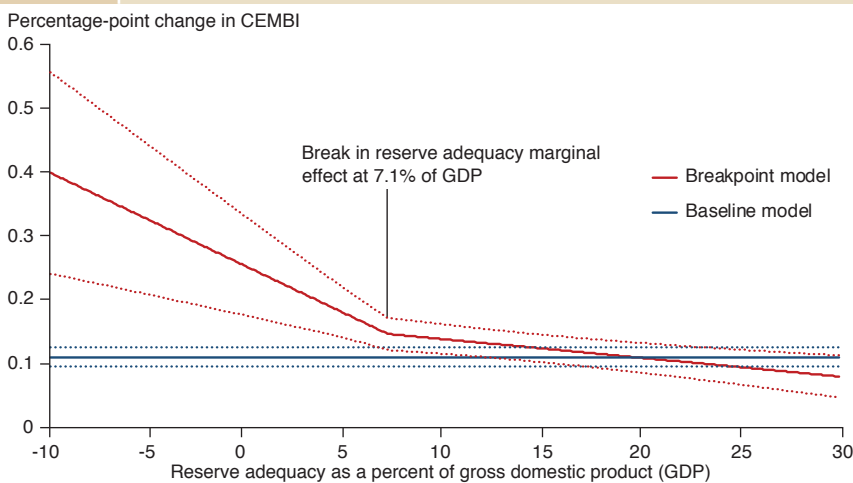


NOTE: The Corporate Emerging Market Bond Index (CEMBI) is calculated from U.S. dollar-denominated bonds and is depicted as the spread above the 10-year Treasury.

SOURCES: Bloomberg; International Monetary Fund; JPMorgan Chase & Co.; Bank for International Settlements; World Bank; Haver Analytics.

CHART 2

Capital Adequacy Affects CEMBI Spread Reaction to Federal Funds Futures Increase



NOTES: Dotted lines indicate 95 percent confidence intervals. Percentage-point change in Corporate Emerging Markets Bond Index (CEMBI) spread is in response to a 1-percentage-point change in the 12-month federal funds futures rate.

SOURCES: Bloomberg; International Monetary Fund; JPMorgan Chase & Co.; Bank for International Settlements; World Bank; Haver Analytics.

with the country's reserve adequacy; the dummy variable allows for that sensitivity to change if adequacy falls below a critical level.⁴

With the Guidotti–Greenspan rule suggesting a safe level for reserves in emerging economies, the panel data model can test if there is an empirically robust level of “sufficient reserve adequacy.”

To that end, a range of possible threshold values is tested—from reserve adequacy of -10 percent of GDP to 20 percent of GDP. The threshold value most supported is 7.1 percent of GDP. When reserve adequacy is less than that, the sensitivity of the CEMBI spread to changes in fed funds futures is proportional to a country's reserve adequacy, with the CEMBI spread becoming more sensitive as reserve adequacy declines.

Reserve adequacy above 7.1 percent doesn't much affect CEMBI sensitivity to expectations of U.S. monetary policy—sensitivity is similar whether reserve adequacy is 9 percent or 29 percent.

Sensitivity to U.S. Monetary Policy

Chart 2 shows the estimated increase in the CEMBI spread following a 1-percentage-point increase in 12-month fed funds futures. The breakpoint model (red line) indicates a diverging marginal effect when reserve adequacy equals 7.1 percent of GDP. Below this breakpoint, the CEMBI spread is increasingly sensitive to U.S. monetary policy.

Above 7.1 percent reserve adequacy, the breakpoint model does not differ in a statistically significant way from a baseline model where the reserve adequacy is not taken into account (blue line). The standard-error bands suggest that above the 7.1 percent threshold, the marginal effects in the two models are indistinguishable.

Emerging Economy Reserve Levels

Chart 3 is a heat map depicting reserve adequacy in 18 emerging economies from 2010 through the second quarter of 2018. A country is a shade of blue if it is above the 7.1 percent breakpoint and a shade of red if it is below the breakpoint, with the intensity of the color indicating how far from the breakpoint it is.

This heat map reveals how countries have changed over time. China, for exam-

ple, had extremely high reserve adequacy in 2010; it has since steadily declined. Thailand has exceedingly high reserve adequacy for the whole period, a lasting policy outcome of the Asian currency crisis in the late 1990s.

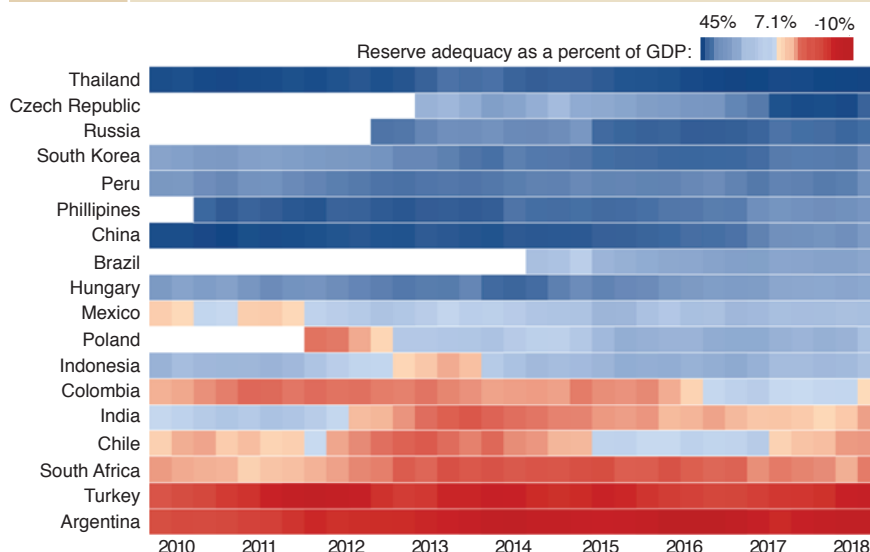
Turkey and Argentina are the two countries with the lowest reserve adequacy. It is apparent that this is not new, but rather an enduring issue. Interestingly, other

countries such as India, Chile and South Africa, all of which have experienced considerable weakness in 2018, are also below the threshold.

Federal Reserve Loosening, Tightening

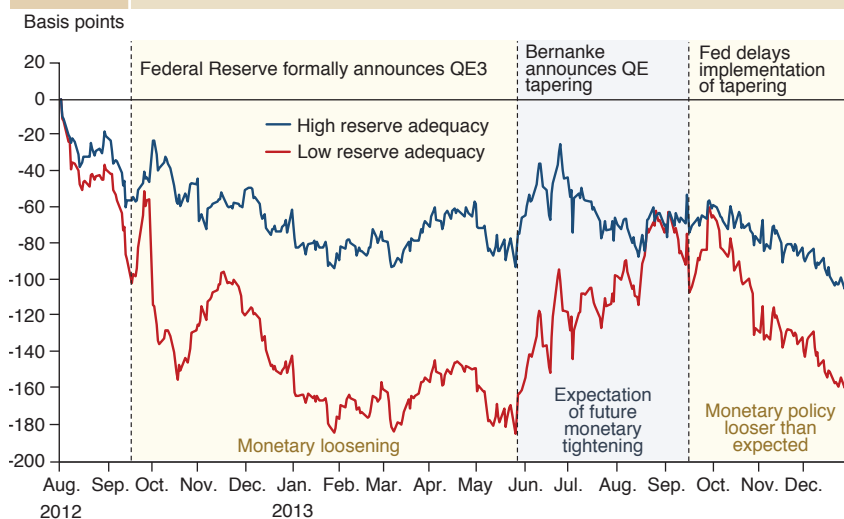
A historical event study illustrates how tightening and loosening Federal Reserve policy affects CEMBI spreads. Chart 4 shows the change in the CEMBI spread for emerg-

CHART 3 Emerging Economy Reserve Adequacy



SOURCES: International Monetary Fund; Bank for International Settlements; World Bank; Haver Analytics.

CHART 4 CEMBI Spread Reacts to U.S. Monetary Policy



NOTE: The Corporate Emerging Market Bond Index (CEMBI) spread is calculated from U.S. dollar-denominated bonds by JPMorgan and is the spread above the 10-year Treasury. QE refers to quantitative easing. Bernanke is former Fed Chairman Ben Bernanke.

SOURCES: JPMorgan Chase & Co.; Bloomberg; International Monetary Fund; Bank for International Settlements; World Bank; Haver Analytics.

ing economies grouped by those above and below the 7.1 percent breakpoint from Aug. 1, 2012, through the end of 2013. The period is characterized by sharp changes in expectations of U.S. monetary policy—in both directions, loosening and tightening.

On Sept. 14, 2012, the Federal Reserve disclosed a third round of quantitative easing (QE3), unconventional monetary policy that attempts to lower rates through the purchase of Treasuries and mortgage-backed bonds. This announcement led to expectations of looser U.S. monetary policy and a weakening dollar. CEMBI spreads in countries with low reserve adequacy declined significantly as their ability to pay off their debts eased, reflecting an exchange rate more to their favor. The spreads in countries with high reserve adequacy also fell during this time of U.S. monetary easing but not by nearly as much.

Federal Reserve Chairman Ben Bernanke hinted during congressional testimony on May 22, 2013, that the Fed could taper its asset purchases. His suggestion that the third round of quantitative easing would be winding down led to expectations of monetary tightening. Markets expected tapering to begin with the September meeting. The CEMBI spread increased sharply in anticipation of tighter U.S. monetary policy and a stronger dollar; the gap between the high- and low-reserve-adequacy countries closed.

Expectations of future monetary policy took another turn when no tapering was announced in September 2013. After that Fed meeting, the fed funds futures-implied policy rate fell to about half of what it had been in the weeks before as investors altered their views of how fast monetary policy tightening would occur.

This shift in policy outlook pushed CEMBI spreads for low-reserve-adequacy emerging economies to separate from their high-reserve-adequacy counterparts, similar to their behavior after the quantitative-easing announcement.

Sensitivity and Adequacy

While Turkey and Argentina have recently been in the headlines for currency depreciation, an empirical model and historical analysis show that other countries with insufficient reserve adequacy, such as South Africa, Chile and India, will also be sensitive to U.S. monetary tightening.

Following the 1997 East Asian currency crisis, countries that include Thailand, South Korea and the Philippines faced a similar problem. In the subsequent decades, these countries ran current-account surpluses and built a large stock of foreign exchange reserves in an effort to reduce their sensitivity to fluctuations in the availability of foreign financing.

At-risk emerging economies can follow this example and increase central bank reserves or decrease short-term foreign

currency debt in order to reduce sensitivity to U.S. monetary policy.

Davis is a research economist and advisor, Crowley is a research analyst and Morris is a research assistant in the Research Department at the Federal Reserve Bank of Dallas.

Notes

¹ "Inflation Rise Poses Challenge to Erdogan as Election Looms," by Laura Pitel, *Financial Times*, June 4, 2018.

² "Remarks by Chairman Alan Greenspan," speech by Alan Greenspan, chairman of the Federal Reserve, April 29, 1999, www.federalreserve.gov/BoardDocs/Speeches/1999/19990429.htm.

³ Federal funds futures are contracts allowing investors to bet or hedge on future movement of the Federal Reserve's mainstay interest mechanism, the overnight bank lending rate, known as the fed funds rate.

⁴ Specifically, we consider the following panel data model using daily data on the CEMBI spread and the 12-month fed funds futures contract. $\Delta CEMBI_{i,t} = \alpha_i + \beta \Delta FFF_t + \gamma RA_{i,t} + \delta F^{RA,t} RA_{i,t} + \Delta FFF_t + \varepsilon_{i,t}$ where $\Delta CEMBI_{i,t}$ is the daily change in the CEMBI spread in country i , ΔFFF_t is the daily change in the 12-month fed funds futures, $RA_{i,t}$ is the level of reserve adequacy in country i and $F^{RA,t}$ is an indicator variable that takes a value of 1 if reserve adequacy in country i is less than a certain threshold T and 0 if it is above that threshold.

Coming Soon: Dallas Fed Economics

Coming in early 2019, economic analysis and thinking from the Federal Reserve Bank of Dallas debuts in a new, online form that will take the place of *Economic Letter*. To ensure that you don't miss any of the latest insight and information from Dallas Fed economists, sign up at dallasfed.org/economics to receive electronic notification as we publish.

Federal Reserve Bank of Dallas

Economic Letter

is published by the Federal Reserve Bank of Dallas. The views expressed are those of the authors and should not be attributed to the Federal Reserve Bank of Dallas or the Federal Reserve System.

Articles may be reprinted on the condition that the source is credited to the Federal Reserve Bank of Dallas.

Economic Letter is available on the Dallas Fed website, www.dallasfed.org.

Marc P. Giannoni, Senior Vice President and Director of Research

Jim Dolmas, Executive Editor

Michael Weiss, Editor

Kathy Thacker, Associate Editor

Christopher Hanley, Graphic Designer

Federal Reserve Bank of Dallas
2200 N. Pearl St., Dallas, TX 75201