



In This Issue

- 1 Central Bank Balance Sheet Policies: Some Policy Implications
- 1 Leaning Against Windy Bank Lending
- 7 Q&A: Seven Questions on the Globalization of Farmland
- 10 IMF Working Papers
- 15 Staff Discussion Notes
- 15 IMF Economic Review

Online Subscriptions

The *IMF Research Bulletin* is available exclusively online. To receive a free email notification when quarterly issues are posted, please subscribe at www.imf.org/external/cntpst. Readers may also access the Bulletin at any time at www.imf.org/researchbulletin.

Research Summaries

Central Bank Balance Sheet Policies: Some Policy Implications

Manmohan Singh and Haobing Wang



In this research summary, we highlight two policy implications from central bank balance sheet policies: (a) assets held due to quantitative easing are not the same as “reserves” (or deposits of the banking system at the central bank), and (b) conventional interest-rate policy and balance sheet adjustments consist of two independent dimensions of monetary policy and they differ in their respective financial spillovers to emerging markets.

Short-term policy rates in many advanced economies (AEs) have remained persistently low since the aftermath of the recent financial crisis. In an effort to manage sluggish economic recoveries and reinvigorate growth, several leading central banks (e.g., the Federal Reserve in the United States, the Bank of England, the European Central Bank, and the Bank of Japan) have carried out several rounds of quantitative easing (QE) to provide further monetary stimulus.

Read more on page 2

Leaning Against Windy Bank Lending

Giovanni Melina and Stefania Villa



In recent times credit booms and busts have dramatically affected business cycle fluctuations. This has called for a deeper understanding of credit market conditions and the role of central banks in ensuring financial stability. We examine whether, during the Great Moderation, interest-

rate policy has reacted and whether it should have indeed reacted to bank lending growth in the U.S. economy. A narrative analysis of the minutes of the Federal Open Market Committee suggests a correlation between concerns on credit conditions and intended changes in the federal funds rate. This finding motivates a more structural investigation. Using an estimated macroeconomic model with banking, this paper first provides evidence that monetary policy did lean against the wind blowing from the loan market. It then shows that, although the estimated monetary policy feedback to bank credit growth yields a small welfare loss, the optimal interest-rate rule features almost no response to credit conditions. Counterfactual experiments unveil that the sources of business cycle fluctuations are crucial in determining whether a “leaning-against-the-wind” policy is optimal or not. In fact, the predominant role of estimated supply shocks in the medium run gives rise to a trade-off between inflation and financial stabilization.

Read more on page 4

Central Bank Balance Sheet Policies— Some Policy Implications

(continued from page 1)

While the empirical evidence for the financial spillovers of QE is well documented, the economic explanation of its international transmission remains relatively obscure. The February meeting minutes of the Federal Open Market Committee (released March 2017) mentioned “that a change to the Committee’s reinvestment policy would likely be appropriate later this year”—i.e., the Fed’s balance sheet will unwind. Brainard (2017) suggests that cross-border spillovers will have important implications if policy rate hikes and balance sheet reductions are not equivalent.

Unwinding Central Bank Balance Sheets May Not Lead to Tightening

Federal Reserve policymakers have recently started discussing when to start gradually reducing their \$4.5 trillion balance sheet. Minutes of their March meeting suggest “that a change to the Committee’s reinvestment policy would likely be appropriate later this year.” This is a subject that the Fed has approached cautiously, out of concern that any decision to shrink the balance sheet would be seen as a tightening of monetary policy. We argue that in fact, unwinding may not be tantamount to tightening.

Why? First, because letting the balance sheet shrink would release “good” collateral such as U.S. Treasury securities, while reducing the excess reserves that commercial banks keep on deposit at the Fed. These deposits came about when the Fed bought trillions of dollars in securities in a bid to keep long-term interest rates low, a strategy known as quantitative easing. Many of the securities were bought from non-bank financial firms, (i.e., pension funds, insurers, asset managers) which stashed the proceeds at depository institutions. Those banks in turn deposited money at the Fed, where it earned interest (only banks can earn interest on excess reserves.) Nonbanks are likely to reuse good collateral, rather than sizable deposits at banks that have remained idle.

There may not be a one-to-one relation between policy rate hikes and the unwinding of central bank balance sheets (Singh, 2017). New regulations instituted to make the financial system safer require banks to hold more “high quality liquid assets.” Both U.S. Treasuries and excess reserves count as high quality liquid assets. But that is where the similarity ends. Good collateral, when pledged, is constantly reused in a process that is similar to money

creation which takes place when banks accept deposits and make loans. That is why good collateral and excess reserves are very different in their implications for market functioning. The relation between the two may not even be positive—i.e., presently, the U.S. Treasury in the hands of the market, with reuse, is likely to lubricate markets, while excess reserves (or money) has remained idle in recent years.

Increasing the availability of good collateral also creates incentives for the reuse of other, less desirable collateral. Most collateral in the markets is exchanged (for money) as a portfolio of securities, rather than as individual securities. Research suggests that at present, collateral reuse rate is below two, on average, down from about three times before the Lehman crisis. The reuse rate is unlikely to bounce back since collateral does not flow within a vacuum but needs bank balance sheets to move. However, private sector balance sheets remain clogged by deposits, a byproduct of QE. Assuming no changes in regulations (e.g., leverage ratio), a lower level of deposits will allow collateral reuse to increase, as balance sheet space at banks becomes more available.

Deposits have taken too much balance-sheet space of the banking sector—excess reserves of the banks at the Fed are presently over \$2 trillion. This inhibits financial intermediation and in turn, monetary policy transmission. As an analogy, oil is only needed for lubricating a car’s engine; similarly, excess reserves, are needed only to smooth out the need for reserves in the financial system. Excess reserves were close to zero before the Lehman crisis. Now instead of an “oil change” we are carrying the oil in the car trunk, in our homes, everywhere.

Presently markets have a strong appetite for good collateral. As seen in the past year, policy rate hikes may not percolate to the long end of the yield curve and vice versa, because the investor base is very different for the short and long end. For example, from the time of the Fed’s 25 basis-point rate hike on December 16, 2015, until the eve of U.S. elections on November 8, 2016, the yield on the 10-year U.S. Treasury note declined, to 1.8 percent from 2.3 percent, as markets digested duration despite sizable sales of Treasuries by many emerging markets throughout 2016.

So, unwinding of a central bank’s balance sheet may not result in tightening. Collateral that will be released (from the asset side of the Fed balance sheet) to the market, with reuse, is a far better lubricant for the financial system than the reduction in banking system deposits, (i.e., reserves balances on the liability side of the Fed balance sheet). Although the

Dodd Frank Act and Basel III make it more expensive for collateral to be reused, the increase in the balance sheet space of the banking system (due to central bank unwind) may more than neutralize the regulatory cost. Thus, a leaner central bank balance sheet may allow for a higher policy rate in this cycle, if unwind does not result in tightening. There are sound theoretical reasons why, in normal times, lean balance sheets allow central banks to focus on the core of its mandate (Bindseil, 2016).

Central Bank Balance Sheet Policy and Spillovers to Emerging Markets

A recent IMF paper (Singh and Wang, 2017) provides a theoretical framework to study the financial spillovers of QE, and QE unwind by the Fed. Although some economists (e.g., Bernanke, 2015) argue that AE central banks can maintain their large balance sheet(s) and there may be no need to unwind these, it may be prudent for EMs to be equipped with the necessary tools in case the economy they are anchored to decides to unwind its balance sheet as part of its monetary policy.

Going forward, several AE central banks will be able to exploit two major dimensions of monetary policy: the short-term policy rate and balance sheet adjustment. As demonstrated by our model, this allows for effective and independent control over both short-term and long-term interest rates. EMs that peg to AEs may need to assess their policy framework and complement their financial stability toolkit by including macroprudential and capital flow management measures. Furthermore, EMs will benefit from recognizing that balance sheet reductions and policy rate hikes may not be equivalent.

We also argue that understanding market signals such as repo rates is crucial, since these have traditionally guided the policy rate. A normal liftoff assumes that all short-term rates will move in line with the policy rate; otherwise, monetary policy transmission could be compromised. Although there has been no balance sheet unwind since Fed's liftoff, the wedge between short-term rates is higher than in the past. When the Federal Reserve unwinds, this could lead to a larger wedge between short-term repo rates and policy rates, since collateral velocity (i.e., the reuse of collateral when released to the market) is not under the central banks' control.

References

- Bernanke, Ben S., 2015, "Monetary Policy in the Future," Speech at the IMF's Rethinking Macro Policy Conference III, April.
- Bindseil, Ulrich, 2016, "Evaluating Monetary Policy Operational Frameworks" Jackson Hole Economic Policy Symposium, Kansas Fed, August.
- Brainard, Lael, 2017, "Cross-Border Spillovers of Balance Sheet Normalization," Speech at NBER's Monetary Economics Summer Institute, New York, NY, July 13, 2017.
- Federal Open Market Committee, 2017, Minutes of the February Meeting, March 15.
- Singh, Manmohan, 2017, "Why Shrinking the Fed Balance Sheet May Have an Easing Effect," *Financial Times*, Alphaville, April 24. <https://ftalphaville.ft.com/2017/04/24/2187716/guest-post-why-shrinking-the-fed-balance-sheet-may-have-an-easing-effect/>
- , and Haobing Wang, 2017, "Central Bank Balance Sheet Policies and Spillovers to Emerging Markets," IMF Working Paper 17/172. International Monetary Fund, Washington, DC.

Leaning Against Windy Bank Lending

(continued from page 1)

The role of central banks in promoting financial stability, in addition to inflation stability, had been debated well before the Great Recession. The so-called “Greenspan doctrine,” which objects to the policy of *leaning* against the wind blowing from asset prices, greatly influenced the central banking world before the crisis. However, in the aftermath of the Great Recession, the need to protect the banking sector from periods of unduly high or excessively low credit growth has led to a renewed interest in the “lean” versus “clean” role for monetary policy, with an emphasis on credit conditions.

Indeed, the important role of credit markets in affecting business cycle fluctuations emerged also from the Basel III framework that aimed to protect the financial sector from periods of excessive credit growth, which is often associated with an increase in systemic risk. On this aspect, Jordà, Schularick, and Taylor (2013) document that, in a sample of 14 countries between 1870 and 2008, more credit-intensive expansions tended to be followed by deeper recessions and slower recoveries. In a recent contribution, Batini, Melina, and Villa (2016) find that higher levels of private leverage lead to more severe recessions, with serious consequences also for public finances. Furthermore, Bordo and Haubrich (2017) provide empirical evidence that bank lending significantly affects GDP fluctuations in the United States.

Our paper (Melina and Villa, 2017) focuses precisely on bank lending and it examines whether interest-rate policy has reacted and whether it should indeed react to bank lending growth in the U.S. economy.

A Narrative Analysis

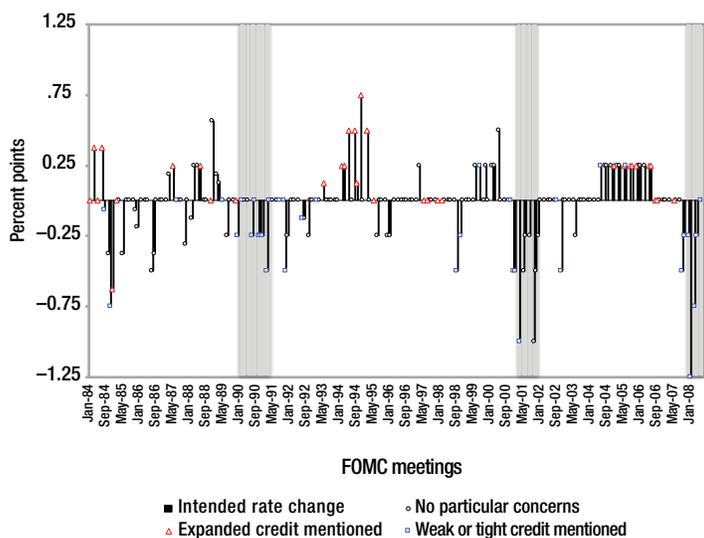
Figure 1 illustrates the intended changes in the federal funds rate (FFR) around all meetings of the Federal Open Market Committee (FOMC) that occurred during the Great Moderation, and whether, in the minutes of each meeting, credit was (i) not a particular concern; (ii) judged to be expanding; or (iii) judged to be weak or tight. The series of intended changes in FFR is an extension of the Romer and Romer (2004) series. It ends in June 2008, before the zero lower bound became binding. To construct our narrative measure of concerns on credit conditions in U.S. monetary policy decisions, we read the statements released after each FOMC meeting and searched for sentences related to credit conditions in the minutes of the 196 meetings held between January 1984 and June 2008. We then constructed two variables. The first takes value 1 if, in the minutes, credit was judged to be expanding and zero otherwise. The second takes value 1 if credit was judged to be weak or tight and zero otherwise. If both variables take value zero, we conclude that credit was not a particular concern.

In most FOMC meetings (79 percent) in which the FFR was intended to be held constant, credit was not a particular concern. In most cases (79 percent) in which the FOMC intended to raise the FFR, an expansion in credit was mentioned; while in the greatest part of FOMC meetings (78 percent) in which the FFR was intended to be lowered, weak or tight credit was mentioned.

Empirical Evidence from a Structural Model

The narrative analysis motivates a more detailed empirical investigation on the extent to which monetary policy had a concern on credit conditions *beyond* their implications for inflation and economic activity. To this end, we build a structural dynamic stochastic general equilibrium (DSGE) model with frictions in the bank loan market, and a monetary policy whereby the short-term interest rate reacts, not only to inflation and the output gap, but also to nominal credit growth. The model is estimated with Bayesian methods over the Great Moderation period, 1984Q1–2008Q2, using a set of U.S. macroeconomic and financial variables.

Figure 1. Intended Federal Funds Rate Changes around FOMC Meetings and Concerns on Credit Conditions Raised in FOMC Minutes



Note: Sample: 1984Q1–2008Q2; shaded areas indicate NBER recessions.
Source: Melina and Villa (2017)

The estimated parameter representing the interest-rate response to nominal credit growth turns out to be statistically positive and economically important. This result is robust to various alternative specifications of the monetary policy rule. Therefore, estimates point to the evidence that, during the Great Moderation, monetary policy did lean against the wind blowing from the loan market beyond its concern for price and output stability. This is a novel result. In fact, Christiano, Motto, and Rostagno (2010) estimate a significant degree of “leaning against credit exuberance” in the euro area monetary policy framework, while Belke and Klose (2010) perform a similar analysis within a reduced-form GMM estimation. However, as far as estimated DSGE models for the U.S. economy are concerned, the literature has so far offered contributions focusing on the reaction of the monetary policy rate to stock prices (see, e.g., Castelnuovo and Nisticò, 2010, among others)—for which we also control—but not to credit conditions.

Normative Analysis

Is the estimated monetary policy response to credit growth the welfare-optimal policy? In our paper, we show that the answer to this question heavily depends on the sources of business cycle fluctuations. We perform a welfare comparison of alternative interest-rate rules, relative to the fully optimal policy, imposing an approximate zero-lower-bound constraint in a way similar to Levine, McAdam, and Pearlman (2008). The estimated response of monetary policy to credit growth delivers a small welfare loss compared to the optimum. Indeed, we find that optimal monetary policy features almost-zero responses both to the output gap and to credit growth. While the former result is in line with the findings of Schmitt-Grohe and Uribe (2007) in a model with perfect credit markets, the latter is a novel contribution. The explanation of such a finding lies in the fact that, in the estimated model, supply shocks—technology, price and wage mark-up—turn out to be the main drivers of output, lending and inflation fluctuations in the medium run. Unlike demand shocks, supply shocks move output and prices in opposite directions, implying a trade-off between inflation and output stabilization. In other words, there is no “divine coincidence” (Blanchard and Galí, 2007) for the two targets. Given the pro-cyclical behavior of lending, a monetary policy that responds also to financial variables should respond more aggressively to inflation. As a result, it turns out to be optimal for monetary policy to respond almost exclusively to inflation. This result is in line with Faia and Monacelli (2007), who show that the presence of only

one policy instrument—the nominal interest rate—in a simpler calibrated model, cannot simultaneously neutralize both financial frictions and price stickiness, and that a strong anti-inflationary stance always leads to the highest level of welfare.

Counterfactual experiments highlight the importance of the sources of business cycle fluctuations. For instance, if we suppress wage mark-up shocks—prominent supply shocks in the estimated model—it would be indeed optimal to lean against windy bank lending. This exercise is important also because it allows reconciling our results with the literature. For instance, Aksoy, Basso, and Coto-Martinez (2013) and Gambacorta and Signoretti (2014), in similar but simpler calibrated models with no wage mark-up shocks, find a leaning-against-the-wind policy to be optimal.

The findings of this paper agree with the recent tendency in central banking to move toward macroprudential instruments as tools to promote financial stability. Indeed, a bolder research effort is necessary to identify effective instruments and design rules that achieve the goal of reducing financial instability without conflicting with the objective of inflation stabilization.

References

- Aksoy, Y., H. Basso, and J. Coto-Martinez. 2013. “Lending Relationships and Monetary Policy.” *Economic Inquiry*, 51(1):368–393.
- Batini, N., G. Melina, and S. Villa. 2016. “Fiscal Buffers, Private Debt and Stagnation: The Good, the Bad and the Ugly.” IMF Working Paper 16/104. Washington, DC: International Monetary Fund.
- Belke, A. and J. Klose. 2010. “(How) Do the ECB and the Fed React to Financial Market Uncertainty?: The Taylor Rule in Times of Crisis.” Discussion Papers of DIW Berlin, 972.
- Bordo, M. D. and J. G. Haubrich. 2017. “Deep Recessions, Fast Recoveries, and Financial Crises: Evidence from the American Record.” *Economic Inquiry*, 55(1):527–541.
- Blanchard, O. and J. Galí (2007). “Real Wage Rigidities and the New Keynesian Model.” *Journal of Money, Credit and Banking*, 39(s1):35–65.
- Castelnuovo, E. and S. Nisticò. 2010. “Stock Market Conditions and Monetary Policy in a DSGE Model for the U.S.” *Journal of Economic Dynamics and Control*, 34(9):1700–1731.
- Christiano, L., R. Motto, and M. Rostagno. 2010. “Financial Factors in Economic Fluctuations.” ECB Working Paper Series, 1192.

Read more on page 6

Leaning Against Windy Bank Lending

(continued from page 5)

Faia, E. and T. Monacelli. 2007. “Optimal Interest Rate Rules, Asset Prices, and Credit Frictions.” *Journal of Economic Dynamics and Control*, 31(10):3228–3254.

Gambacorta, L. and F. M. Signoretti. 2014. “Should Monetary Policy Lean Against the Wind?: An Analysis Based on a DSGE Model with Banking.” *Journal of Economic Dynamics and Control*, 43:146–174.

Jordà, O, M. H. Schularick and A. M. Taylor. 2013. “When Credit Bites Back.” *Journal of Money, Credit and Banking*, 45(2S):3–28.

Levine, P., P. McAdam and J. Pearlman. 2008. “Quantifying and Sustaining Welfare Gains from Monetary Commitment.” *Journal of Monetary Economics*, 55(7):1253–1276.

Melina, G., and S. Villa. 2017. “Leaning Against Windy Bank Lending.” IMF Working Paper 17/179. Washington, DC: International Monetary Fund. (Also, forthcoming in *Economic Inquiry*.)

Romer, C. D. and D. H. Romer. 2004. “A New Measure of Monetary Shocks: Derivation and Implications.” *American Economic Review*, 94(4):1055–1084.

Schmitt-Grohe, S. and M. Uribe. 2007. “Optimal Simple and Implementable Monetary and Fiscal Rules.” *Journal of Monetary Economics*, 54(6):1702–1725.

Just Released!

IMF Annual Report 2017

Promoting Inclusive Growth

- An in-depth look at IMF policy advice, financial support, and capacity development to strengthen economies.
- Spotlights on key activities, including trade, productivity, inclusive growth, and women in the work force.
- An interactive online format for desktop and mobile.

Read the report online at imf.org/ar2017



INTERNATIONAL MONETARY FUND



Seven Questions on the Globalization of Farmland

By Christian Bogmans



A forthcoming IMF working paper, entitled “The Globalization of Farmland: Theoretical and Empirical Evidence,” co-authored by Rabah Arezki, Christian Bogmans, and Harris Selod, analyzes the drivers behind the surge in transnational acquisitions of

farmland in the aftermath of the Great Recession. The paper finds, for the first time, statistical evidence that land deals were directed at isolated developing countries that until recently participated little in global agricultural trade and that are in dire need of agricultural investment.

Question 1. Can you explain what globalization of farmland entails?

It describes a relatively new situation in which farmland is sold or leased to international investors. In other words, farmland has become an international commodity. Against the backdrop of increasing demand for food, there has been a growing interest by governments, agribusinesses, and investment funds in acquiring long-term property rights or leases over large areas of farmland, mostly in developing countries. The phenomenon rose to prominence in the aftermath of the food crisis of 2007–2008, when substantial increases in food prices raised farmland value and the option value of securing land for food production.

Question 2. How are large-scale land acquisitions related to other trends in agriculture?

The increased interest in farmland is part of a broader set of developments that are changing the nature of the agricultural sector. Not only have multinational companies and foreign direct investment become more important in promoting sectoral growth, the role of global value chains in expanding food supply has become more prominent (Maertens and Swinnen, 2015). In this ongoing process of agricultural globalization, the volume of international trade in agricultural commodities increased almost five-fold, from approximately \$200 billion in 1980 to almost \$1100 billion in 2010, the largest growth recorded by any sector.

Question 3. What does the data tell us?

According to the Land Matrix, an online database of large-scale land acquisitions that are verified by non-governmental organizations (NGOs), more than 2100 deals were negotiated between 2000 and 2016, with a cumulative size of almost 59 million hectares in 88 countries worldwide. This expanse corresponds to an area the size of the Ukraine, which is equal to roughly 15 percent of the remaining global stock of unused and non-forested arable land. Sub-Saharan Africa (~900 deals) and east Asia (~600 deals) have been the most important target regions, followed by Latin America (~350 deals).

Question 4. What explains the concentration of land deals in Africa and Asia?

Obviously, these continents govern comparatively large areas of unused arable land. In earlier work, my co-authors found that investors were targeting countries with weak tenure security for existing land users, supposedly because this would allow investors to obtain land without compensating existing users (see Arezki and others, 2013). Indeed, in many countries in Africa and Asia land ownership rights are mostly informal, with little possibility for existing users to take legal action if their land holdings are appropriated by the state or powerful investors.

Not surprisingly, many NGOs and policymakers have classified these land deals as outright land grabs. With the demand for food increasing because of rising incomes and ballooning populations, private investors and agribusinesses were buying land to reap substantial profits. Moreover, many governments—such as several Gulf States and China—have acquired vast areas of farmland abroad for offshore food production to reduce their dependency on imports to feed their people. Investments that are motivated by food independence may improve food security in middle- and high-income countries at the expense of food security of low-income areas.

Read more on page 8

Seven Questions on the Globalization of Farmland

(continued from page 7)

Question 5. How does your new paper shed light on the desirability of these land acquisitions?

In our recent paper, we propose a novel theoretical framework in which food trade and land acquisitions are driven by cross-country differences in technology, land endowments, geography, and institutions. The framework also allows us to distinguish between investments motivated by profits and food independence.

Our model predicts that under the profit motive investors will, all things equal, be more interested in buying land in countries with good access to world markets because this raises profit potential. In contrast, under the food-independence motive investors are only interested in exporting to their country of origin. They are then discouraged by a high degree of openness to world markets as this increases the degree of competition between different investors.

We then tested the model's predictions using trade and acquisition data for the period 2006–2013. Consistent with the food independence motive, we find that investors preferred to invest in countries that (at least until recently) had weak access to world markets and participated little in global agricultural trade, even after controlling for land endowments, tenure security, and a variety of other factors.

Hence, large-scale land acquisitions seem to have been directed at isolated, food-insecure countries that are in dire need of investment in the agricultural sector.

Question 6. How should policymakers regulate large-scale land acquisitions?

On the one hand, these acquisitions have the potential to deliver benefits in those countries where it matters the most. They signal that capital, technology, and agronomic knowledge in the agricultural sector is flowing from rich investors to poor countries.

On the other hand, the clustering of these deals in vulnerable countries can potentially amplify the detrimental effects of a future food crisis. Our findings suggest that the food independence agenda is real. Acquiring land abroad with the purpose of re-exporting the produce to the investor country may be detrimental to food security of the host country. In addition, investors may buy land for speculative purposes, keeping the land

idle until food prices increase (see Collier and Venables, 2012), or they may rely intensively on foreign instead of local factors of production.

So, the outcome of these deals could be both positive or negative for the host countries. Host country governments can remedy the risks by investing in monitoring capacity to ensure that land is leased to investors who employ workers from the local population, promote integration of local business into value chains, and co-invest in local public goods and infrastructure.

Furthermore, countries may set strict rules for compensation paid to displaced land users. Strict rules make it easier for the state to protect and enforce property rights of displaced land users than under a liability regime. Under liability regimes, especially in the developed world, the subversion of justice by powerful investors through legal skill, bribery, or even physical force against the weak is a serious concern (see Glaeser, Ponzetto, and Schleifer, 2016).

Question 7. Can we expect another rush for land in the future and what will it look like?

In recent years, investors' interest in land acquisitions has somewhat waned. However, food prices are bound to increase again in the future. When that happens the search for available land overseas will in some shape or form intensify again.

There continues to be ample opportunity to increase agricultural productivity in developing countries, especially in Sub-Saharan Africa where yields are 50 percent below their potential level. To maintain current levels of cereal self-sufficiency by 2050, complete closure of the gap between existing and potential yield across the African continent is required (see van Ittersum and others, 2016). Many farmers in the developing world are slow to adopt technological innovations, however, and so foreign investments in farmland could be beneficial.

Nevertheless, a repeat of the past, in which countries tried to secure their food supplies by offshoring production without ensuring adequate food supply in the host countries, seems less likely. In this context, it is interesting to note that China appears to have a strategic incentive to make this happen. Since China is very land scarce, it will continue to rely on food imports, even more so now that its citizens are transitioning towards a Western-style diet. At the same time, with the world

population set to rise from 7.6 billion today to 9.8 billion in 2050, food demand is expected to grow strongly in the rest of the world too. In Africa alone, the population is expected to increase by 1 billion.

To an increasing extent, China's demand for food will conflict with the development needs of countries from which it is importing food. The last food crisis of 2007–2008 proved that in times of need, governments of food exporting countries will limit exports to insulate their population from rising global food prices. This could pose substantial problems for food importers. It is thus in China's self-interest to limit the probability of such events playing out. In this context, land acquisitions may continue to play a role in the agricultural sector provided they raise food supplies across the board.

References

- Arezki, Rabah, Klaus Deininger, and Harris Selod. 2013. "What Drives the Global "Land Rush"?" *The World Bank Economic Review* 29(2): 207-233.
- Collier, Paul, and Anthony J. Venables. 2012. "Land Deals in Africa: Pioneers and Speculators." *Journal of Globalization and Development* 3.1.
- Glaeser, Edward L., Giacomo A.M. Ponzetto, and Andrei Shleifer. 2016. "Securing Property Rights." NBER Working Paper No. w22701. National Bureau of Economic Research. The Land Matrix Global Observatory. Accessed May 7, 2016. <http://landmatrix.org/en/get-the-detail/>.
- Maertens, Miet, and Johan Swinnen. 2015. "Agricultural Trade and Development: A Value Chain Perspective." No. ERSD-2015-04. WTO Staff Working Paper, 2015.
- Van Ittersum, Martin K., and others. 2016. "Can Sub-Saharan Africa Feed Itself?" *Proceedings of the National Academy of Sciences* 113.52: 14964-14969.

Global economic knowledge at your fingertips.

- IMF Publications and IMF Data
- Annotation, citation, and sharing tools
- Curated country and topic sites
- A variety of reading formats for PC and mobile devices and more...

eLibrary.imf.org/rb



IMF Working Papers

IMF Working Papers and other IMF publications can be downloaded in full-text format from the **Research at the IMF** website: <http://www.imf.org/research>.

Working Paper No. 17/133

Bottom-Up Default Analysis of Corporate Solvency Risk: An Application to Latin America

Jorge A. Chan-Lau, Cheng Hoon Lim, Jose Daniel Rodríguez-Delgado, Bennett W. Sutton, Melesse Tashu

Working Paper No. 17/134

Financial Frictions, Underinvestment, and Investment Composition: Evidence from Indian Corporates

Sonali Das, Volodymyr Tulin

Working Paper No. 17/135

Capital Controls and the Cost of Debt

Eugenia Andreasen, Martin Schindler, Patricio A. Valenzuela

Working Paper No. 17/136

ABBA: An Agent-Based Model of the Banking System

Jorge A. Chan-Lau

Working Paper No. 17/137

Heterogeneity of Bank Risk Weights in the EU: Evidence by Asset Class and Country of Counterparty Exposure

Rima Turk-Ariss

Working Paper No. 17/138

Public Investment Scaling-up and Debt Sustainability: The Case of Energy Sector Investments in the Caribbean

Ahmed El-Ashram

Working Paper No. 17/139

The Right Kind of Help?: Tax Incentives for Staying Small

Dora Benedek, Pragyant Deb, Borja Gracia, Sergejs Saksonovs, Anna Shabunina, Nina Budina

Working Paper No. 17/140

Cross-Country Spillovers of Fiscal Consolidations in the Euro Area

Tigran Poghosyan

Working Paper No. 17/141

Who Dares, Wins: Labor Market Reforms and Sovereign Yields

Christian H. Ebeke

Working Paper No. 17/142

Tipping the Scale?: The Workings of Monetary Policy through Trade

Gustavo Adler, Carolina Osorio Buitron

Working Paper No. 17/143

Financial Development and Source of Growth: New Evidence

Sami Ben Naceur, Robert Blotvogel, Mark Fischer, Haiyan Shi

Working Paper No. 17/144

Migration and Remittances in Latin America and the Caribbean: Engines of Growth and Macroeconomic Stabilizers?

Kimberly Beaton, Svetlana Cerovic, Misael Galdamez, Metodij Hadzi-Vaskov, Franz Loyola, Zsoka Koczan, Bogdan Lissovlik, Jan Kees Martijn, Yulia Ustyugova, Joyce Wong

Working Paper No. 17/145

Fiscal Reforms, Long-term Growth and Income Inequality

Santiago Acosta Ormaechea, Takuji Komatsuzaki, Carolina Correa-Caro

Working Paper No. 17/146

Extensive Margin Adjustment of Multi-Product Firm and Risk Diversification

Carlos Carvalho, Gee Hee Hong, Jing Zhou

Working Paper No. 17/147

Does the Stock Market Boost Firm Innovation?: Evidence from Chinese Firms

Hui He, Hanya Li, Jinfan Zhang

Working Paper No. 17/148

Trade Integration in Latin America: A Network Perspective

Kimberly Beaton, Aliona Cebotari, Xiaodan Ding, Andras Komaromi

Working Paper No. 17/149

Towards Macroprudential Stress Testing: Incorporating Macro-Feedback Effects

Ivo Krznar, Troy D. Matheson

Working Paper No. 17/150

Panama's Growth Prospects: Determinants and Sectoral Perspectives

Kimberly Beaton, Metodij Hadzi-Vaskov

Working Paper No. 17/151

The Macroeconomic Effects of Trade Tariffs: Revisiting the Lerner Symmetry Result

Jesper Lindé, Andrea Pescatori

[Working Paper No. 17/152](#)**Central Bank Emergency Support to Securities Markets**

Darryl King, Luis Brandao-Marques, Kelly Eckhold, Peter Lindner, Diarmuid Murphy

[Working Paper No. 17/153](#)**Financial Stability Analysis: What Are the Data Needs?**

Robert M. Heath, Evrim Bese Goksu

[Working Paper No. 17/154](#)**Exchange Rate Choices with Inflexible Markets and Costly Price Adjustments**

Tara Iyer

[Working Paper No. 17/155](#)**IMF Lending in an Interconnected World**

Jean-Guillaume Poulain, Julien Reynaud

[Working Paper No. 17/156](#)**The Informal Economy in Sub-Saharan Africa: Size and Determinants**

Leandro Medina, Andrew W. Jonelis, Mehmet Cangul

[Working Paper No. 17/157](#)**A License to Issue (Anywhere): Patterns and Drivers of Corporate Bonds in Latin America**

Svetlana Vtyurina, Adrian Robles, Bennett W. Sutton

[Working Paper No. 17/158](#)**The Evolution of Potential VAT Revenues and C-Efficiency in Advanced Economies**

Junji Ueda

[Working Paper No. 17/159](#)**On Swing Pricing and Systemic Risk Mitigation**

Sheheryar Malik, Peter Lindner

[Working Paper No. 17/160](#)**A Crude Shock: Explaining the Impact of the 2014–16 Oil Price Decline Across Exporters**

Francesco Grigoli, Alexander Herman, Andrew J. Swiston

[Working Paper No. 17/161](#)**Basel Compliance and Financial Stability: Evidence from Islamic Banks**

Mohammad Bitar, Sami Ben Naceur, Rym Ayadi, Thomas Walker

[Working Paper No. 17/162](#)**The Re-Emerging Privilege of Euro Area Membership**

Johannes Wiegand

[Working Paper No. 17/163](#)**Financial Resource Curse in Resource-Rich Countries**

Montfort Mlachila, Rasmané Ouedraogo

[Working Paper No. 17/164](#)**Designing a Simple Loss Function for Central Banks: Does a Dual Mandate Make Sense?**

Davide Debortoli, Jinill Kim, Jesper Lindé, Ricardo C Nunes

[Working Paper No. 17/165](#)**Smooth Operator: Remittances and Fiscal Shocks**

Kimberly Beaton, Serhan Cevik, Reza Yousefi

[Working Paper No. 17/166](#)**Women Are Key for Future Growth: Evidence from Canada**

Bengt Petersson, Rodrigo Mariscal, Kotaro Ishi

[Working Paper No. 17/167](#)**What Explains the Decline of the U.S. Labor Share of Income?: An Analysis of State and Industry Level Data**

Yasser Abdih, Stephan Danninger

[Working Paper No. 17/168](#)**Efficiency-Adjusted Public Capital, Capital Grants, and Growth**

Ernesto Crivelli

[Working Paper No. 17/169](#)**Why Is Labor Receiving a Smaller Share of Global Income?: Theory and Empirical Evidence**

Mai Chi Dao, Mitali Das, Zsoka Koczan, Weicheng Lian

[Working Paper No. 17/170](#)**Macprudential Policy Spillovers: A Quantitative Analysis**

Heedon Kang, Francis Vitek, Rina Bhattacharya, Phakawa Jeasakul, Sònia Muñoz, Naixi Wang, Rasool Zandvakil

[Working Paper No. 17/171](#)**Sovereign Debt Restructurings in Grenada: Causes, Processes, Outcomes, and Lessons Learned**

Tamon Asonuma, Xin Li, Michael G. Papaioannou, Saji Thomas

[Working Paper No. 17/172](#)**Central Bank Balance Sheet Policies and Spillovers to Emerging Markets**

Manmohan Singh, Haobin Wang

[Working Paper No. 17/173](#)**Government Financial Assets and Debt Sustainability**

Camila Henao Arbelaez, Nelson Sobrinho

Read more on page 12

IMF Working Papers

(continued from page 11)

Working Paper No. 17/174

Uphill Capital Flows and the International Monetary System

Balazs Csonto, Camilo E. Tovar Mora

Working Paper No. 17/175

Bank Consolidation, Efficiency, and Profitability in Italy

Anke Weber

Working Paper No. 17/176

The Financing of Ideas and the Great Deviation

Daniel Garcia-Macia

Working Paper No. 17/177

Mining Spillovers in Chile

Esther Perez Ruiz

Working Paper No. 17/178

Calculating Trade in Value Added

Aqib Aslam, Natalija Novta, Fabiano Rodrigues-Bastos

Working Paper No. 17/179

Leaning Against Windy Bank Lending

Giovanni Melina, Stefania Villa

Working Paper No. 17/180

When Gambling for Resurrection Is Too Risky

Divya Kirti

Working Paper No. 17/181

Back to the Future: The Nature of Regulatory Capital Requirements

Ralph Chami, Thomas F. Cosimano, Emanuel Kopp, Celine Rochon

Working Paper No. 17/182

Structural Reforms and External Rebalancing

Alexander Culiuc, Annette Kyobe

Working Paper No. 17/183

Corporate Investment and the Real Exchange Rate

Mai Chi Dao, Camelia Minoiu, Jonathan David Ostry

Working Paper No. 17/184

The Nonlinear Interaction Between Monetary Policy and Financial Stress

Martín Saldías

Working Paper No. 17/185

Cyber Risk, Market Failures, and Financial Stability

Emanuel Kopp, Lincoln Kaffenberger, Christopher Wilson

Working Paper No. 17/186

Stabilizing the System of Mortgage Finance in the United States

Richard Koss

Working Paper No. 17/187

Taxation and the Peer-to-Peer Economy

Aqib Aslam, Alpa Shah

Working Paper No. 17/188

Bankruptcy Technology, Finance, and Entrepreneurship

Nelson Sobrinho

Working Paper No. 17/189

Finance and Employment in Developing Countries: The Working Capital Channel

Mai Chi Dao, Lucy Qian Liu

Working Paper No. 17/190

Housing Finance and Real Estate Markets in Colombia

Francisco Roch

Working Paper No. 17/191

Emissions and Growth: Trends and Cycles in a Globalized World

Gail Cohen, João Tovar Jalles, Prakash Loungani, Ricardo Marto

Working Paper No. 17/192

Macroeconomic and Distributional Effects of Personal Income Tax Reforms: A Heterogenous Agent Model Approach for the U.S.

Sandra V. Lizarazo Ruiz, Adrian Peralta-Alva, Damien Puy

Working Paper No. 17/193

How Important Is the Global Financial Cycle? Evidence from Capital Flows

Eugenio M. Cerutti, Stijn Claessens, Andrew K. Rose

Working Paper No. 17/194

Western Balkans: Increasing Women's Role in the Economy

Ruben V. Atoyán, Jesmin Rahman

Working Paper No. 17/195

The Political Economy of Fiscal Transparency and Independent Fiscal Councils

Roel M.W.J. Beetsma, Xavier Debrun, Randolph Sloof

Working Paper No. 17/196**Oil Prices and Inflation Dynamics: Evidence from Advanced and Developing Economies**

Sangyup Choi, Davide Furceri, Prakash Loungani, Saurabh Mishra, Marcos Poplawski-Ribeiro

Working Paper No. 17/197**Benchmarking Social Spending Using Efficiency Frontiers**

Javier Kapsoli, Iulia Ruxandra Teodoru

Working Paper No. 17/198**Fiscal Stabilization and Growth: Evidence from Industry-level Data for Advanced and Developing Economies**

Sangyup Choi, Davide Furceri, João Tovar Jalles

Working Paper No. 17/199**Banking on Women Leaders: A Case for More?**

Ratna Sahay, Martin Cihak, Papa M. N'Diaye, Adolfo Barajas, Annette Kyobe, Srobona Mitra, Yen N. Mooi, Reza Yousefi

Working Paper No. 17/200**The Effect of Leverage on Asset Sales Between Financial Institutions**

Sonali Das

Working Paper No. 17/201**What Prevents a Real Business Cycle Model from Matching the U.S. Data? Decomposing the Labor Wedge**

Dmitry Plotnikov

Working Paper No. 17/202**Growth Breaks and Growth Spells in Sub-Saharan Africa**

Francisco Arizala, Jesus R. Gonzalez-Garcia, Charalambos G. Tsangarides, Mustafa Yenice

Working Paper No. 17/203**Medium-Term Budget Frameworks in Sub-Saharan African Countries**

Richard Allen, Taz Chaponda, Lesley Fisher, Rohini Ray

Working Paper No. 17/204**Policy Mix and the U.S. Trade Balance**

Gustavo Adler, Carolina Osorio Buitron

Working Paper No. 17/205**Indexing Structural Distortion: Sectoral Productivity, Structural Change and Growth**

Sakai Ando, Koffie Ben Nassar

Working Paper No. 17/206**Did the Exchange Rate Floor Prevent Deflation in the Czech Republic?**

Francesca G. Caselli

Working Paper No. 17/207**FX Intervention in the New Keynesian Model**

Zineddine Alla, Raphael A. Espinoza, Atish R. Ghosh

Working Paper No. 17/208**The Adjustment to Commodity Price Shocks in Chile, Colombia, and Peru**

Francisco Roch

Working Paper No. 17/209**Loss of Correspondent Banking Relationships in the Caribbean: Trends, Impact, and Policy Options**

Trevor Serge Coleridge Alleyne, Jacques Bouhga-Hagbe, Thomas Dowling, Dmitriy Kovtun, Alla Myrvoda, Joel Chiedu Okwuokei, Jarkko Turunen

Working Paper No. 17/210**Interconnectedness of Global Systemically-Important Banks and Insurers**

Sheheryar Malik, TengTeng Xu

Working Paper No. 17/211**Uncertainty, Financial Frictions and Nominal Rigidities: A Quantitative Investigation**

Ambrogio Cesa-Bianchi, Emilio Fernández Corugedo

Working Paper No. 17/212**Quantitative Easing and Long-Term Yields in Small Open Economies**

Antonio Diez de los Rios, Maral Shamloo

Working Paper No. 17/213**Settling the Inflation Targeting Debate: Lights from a Meta-Regression Analysis**

Hippolyte W. Balima, Eric G. Kilama, Rene Tapsoba

Working Paper No. 17/214**Lessons from the Old Masters on Assessing Equity and Efficiency: A Primer for Fiscal Policymakers**

Vitor Gaspar, Paolo Mauro, Tigran Poghosyan

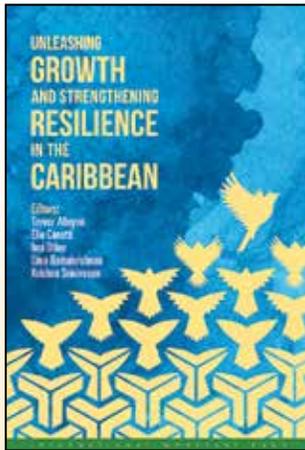
Working Paper No. 17/215**Market Reforms at the Zero Lower Bound**

Matteo Cacciatore, Romain A. Duval, Giuseppe Fiori, Fabio Ghironi

Working Paper No. 17/216**Understanding Correspondent Banking Trends: A Monitoring Framework**

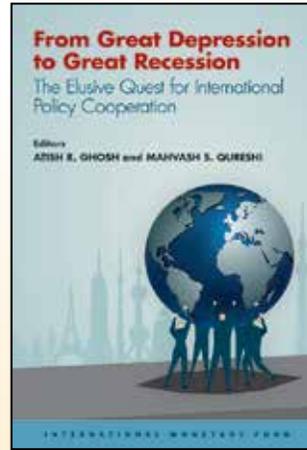
Dirk Jan Grolleman, David Jutrsa

Highlights from IMF Publications



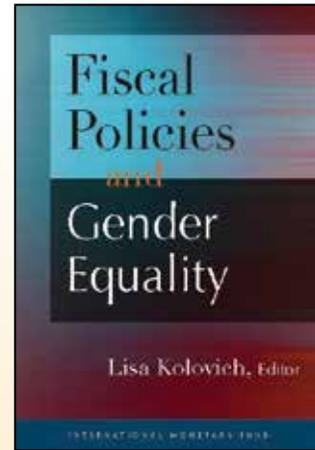
Unleashing Growth and Strengthening Resilience in the Caribbean

\$25. ©2017. Paperback
ISBN 978-1-48431-519-4. Approx. 400pp.



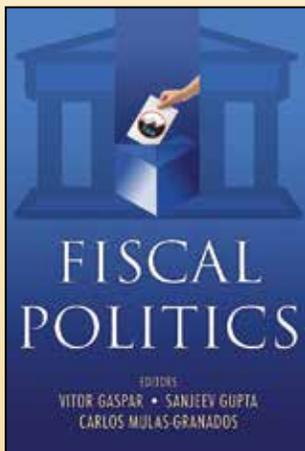
From Great Depression to Great Recession: The Elusive Quest for International Policy Cooperation

\$27. ©2017. Paperback
ISBN 978-1-51351-427-7. 256pp.



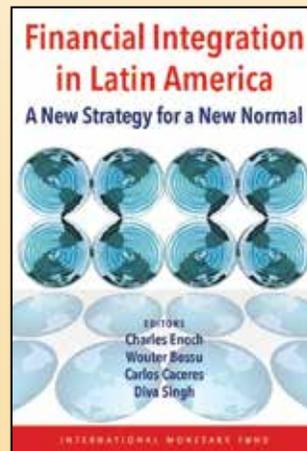
Fiscal Policies and Gender Equality

\$25. ©2017. Paperback
ISBN 978-1-51359-036-3.



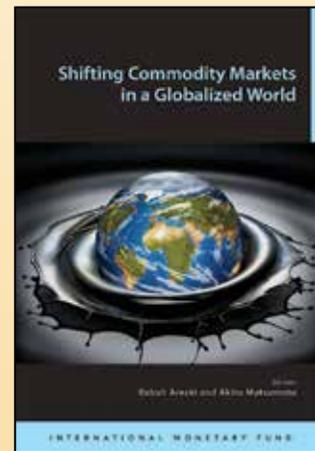
Fiscal Politics

\$40. ©2017. Paperback
ISBN 978-1-47554-790-0. 548pp



Financial Integration in Latin America: A New Strategy for a New Normal

\$25. ©2017. Paperback
ISBN 978-1-51352-024-7. 177pp.



Shifting Commodity Markets in a Globalized World

\$25. ©2017. Paperback
ISBN 978-1-48431-032-8. Approx. 256pp.



bookstore.imf.org

INTERNATIONAL MONETARY FUND



IMF Research Bulletin

Rabah Arezki
Editor

Prakash Loungani
Co-Editor

Patricia Loo
Assistant Editor

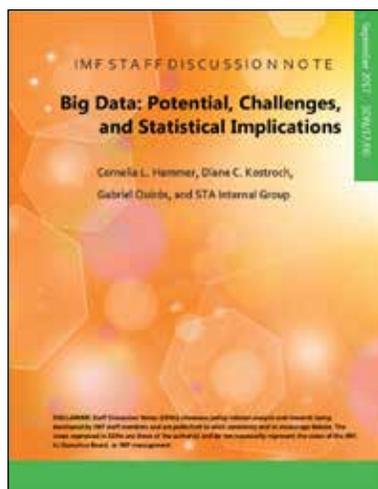
Tracey Lookadoo
Editorial Assistant

Multimedia Services
Composition

The *IMF Research Bulletin* (ISSN: 1020-8313) is a quarterly publication in English and is available free of charge. The views expressed in the *Bulletin* are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Material from the *Bulletin* may be reprinted with proper attribution. Editorial correspondence may be addressed to The Editor, *IMF Research Bulletin*, IMF, Room HQ1-9-612, Washington, DC 20431 USA; or e-mailed to resbulletin@imf.org.

For Electronic Notification

Sign up at www.imf.org/external/cntpst to receive notification of new issues of the *IMF Research Bulletin* and a variety of other IMF publications. Individual issues of the *Bulletin* are available at www.imf.org/researchbulletin.



Staff Discussion Notes

Staff Discussion Notes showcase new policy-related analysis and research by IMF departments. These papers are generally brief and written in nontechnical language, and are aimed at a broad audience interested in economic policy issues. For more information on this series and to download the papers in this series, please visit: www.imf.org/en/Publications/SPROLLS/Staff-Discussion-Notes

No. 17/05

Fintech and Financial Services: Initial Considerations

Dong He, Ross Leckow, Vikram Haksar, Tommaso Mancini Griffoli, Nigel Jenkinson, Mikari Kashima, Tanai Khiaonarong, Céline Rochon, and Hervé Tourpe

No. 17/06

Big Data: Potential, Challenges, and Statistical Implications

Cornelia L. Hammer, Diane C. Kostroch, Gabriel Quirós, and STA Internal Group



IMF Economic Review

IMF Economic Review, published with Palgrave Macmillan, is the official research journal of the International Monetary Fund. The journal provides a rigorous analytical forum for discussing some of the most important policy questions of our time.

The next issue of the *IMF Economic Review* (Vol. 65, No. 3) is a special issue on “Exchange Rates and External Adjustment” that features key papers presented at a conference organized with the Swiss National Bank. Articles look at issues such as the impact of portfolio choice on external rebalancing; the role of financial fragmentation and fiscal policy on the adjustment process; and why trade flows seem so unresponsive to exchange rates.

Visit the journal website to:

- To view journal content
- To submit articles
- To subscribe to the journal

<http://bit.ly/Palgrave-IMFER>