

Discussion of “Monetary Policy for Commodity Booms and Busts” by Thomas Drechsel, Michael McLeay, and Silvana Tenreyro

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I. Introduction

This paper by Thomas Drechsel, Michael McLeay, and Silvana Tenreyro addresses a timely and important issue. It gives fascinating perspectives on how monetary policy should react to commodity market booms and busts, especially for emerging economies that export commodities. This issue is strongly motivated by the powerful commodity market cycles that greatly affected the global economy in recent decades. The paper provides a new-Keynesian model with two sectors to show that a commodity price shock can lead to misallocation of investment between commodity and non-commodity sectors and to provide a quantitative comparison of the effectiveness of alternative policy rules. By focusing on monetary policy for emerging economies, the paper is nicely connected to the symposium’s main theme of challenges for monetary policy. The paper’s focus also echoes other issues discussed during the symposium, such as dispersion in monetary policies cross countries, policy spillovers to emerging economies, and exchange rate and capital flow fluctuations. This is clearly an area that deserves more attention from policy makers and academics around the world.

I anchor my discussion on three key issues: 1) the increasing complexity of the global commodity markets, driven by the joint presence of multiple shocks with very different natures—demand shocks, supply shocks, and investment flow shocks; 2) the challenges created by this complex shock structure to policy makers, and in particular, the difficulty in differentiating these shocks in order to respond with suitable policies; and 3) macroprudential policy tools as an alternative policy instrument to lean against misallocation and distortions caused by commodity market shocks.

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II. Commodity market shocks

James Hamilton (1983) made an important contribution to the literature on macroeconomic effects of commodity market shocks by showing that large crude oil price increases caused by global supply disruptions contributed to several of the U.S. recessions before the 1970s. Lutz Kilian (2009) expanded this line of research by providing a structural estimation to show that global demand shocks played an important role in driving oil prices in the 2000s, which was partially driven by the economic boom in emerging economies. More recently, Tang and Xiong (2012) further argued that a new type of shocks, investment flow shocks, emerged in global commodity markets after the mid-2000s. Financial investors' strong interests in investing in the booming emerging economies combined with the shortage of liquid instruments for direct investment in emerging economies led to large investment flows on the order of hundreds of billions of dollars into commodity futures markets and other commodity-related financial securities.

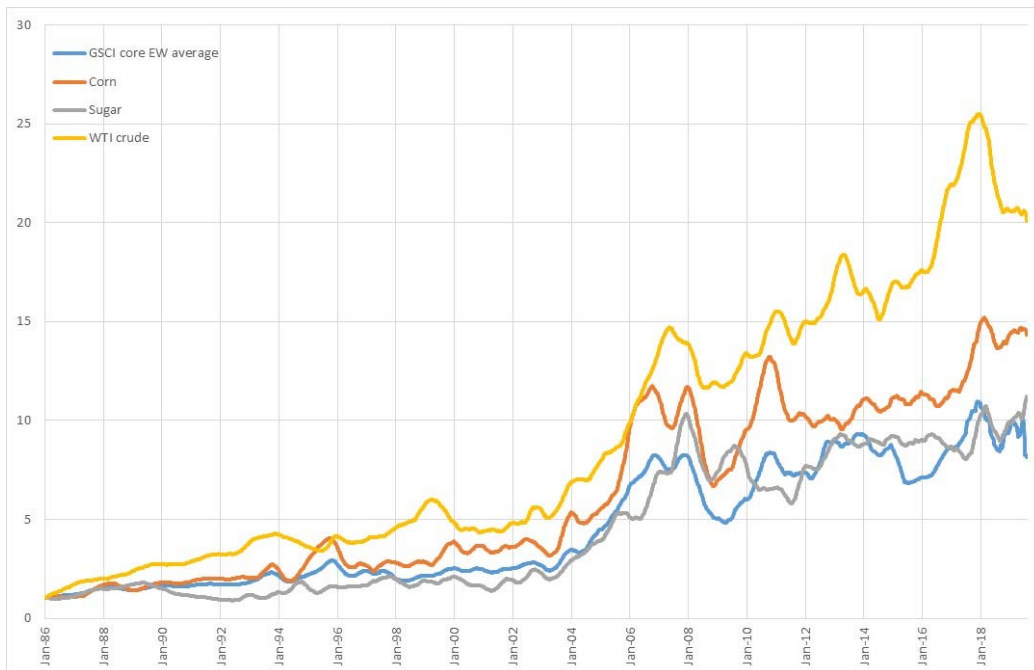


Figure 1. Open interest in GSCI, corn, sugar, and crude oil, normalized to the average 1986 open interest. The GSCI core EW average is the equal-weighted commodity average within the GSCI commodities that have data going back to 1986. All values are 52-week trailing averages. Data source: CFTC COT reports.

Figure 1 depicts open interest in a variety of commodity futures markets, including the GSCI commodity index, corn, sugar, and crude oil. Open interest has substantially expanded since the mid-2000s and continued to grow even after the world financial crisis in 2008; it has been largely driven by the strong interest of financial investors in using commodity futures as a vehicle to invest in emerging economies, which are appealing as a hedge to fluctuations in advanced economies. See Cheng and Xiong (2014) for a more extensive review of issues related to the large investment flow to commodity futures markets.

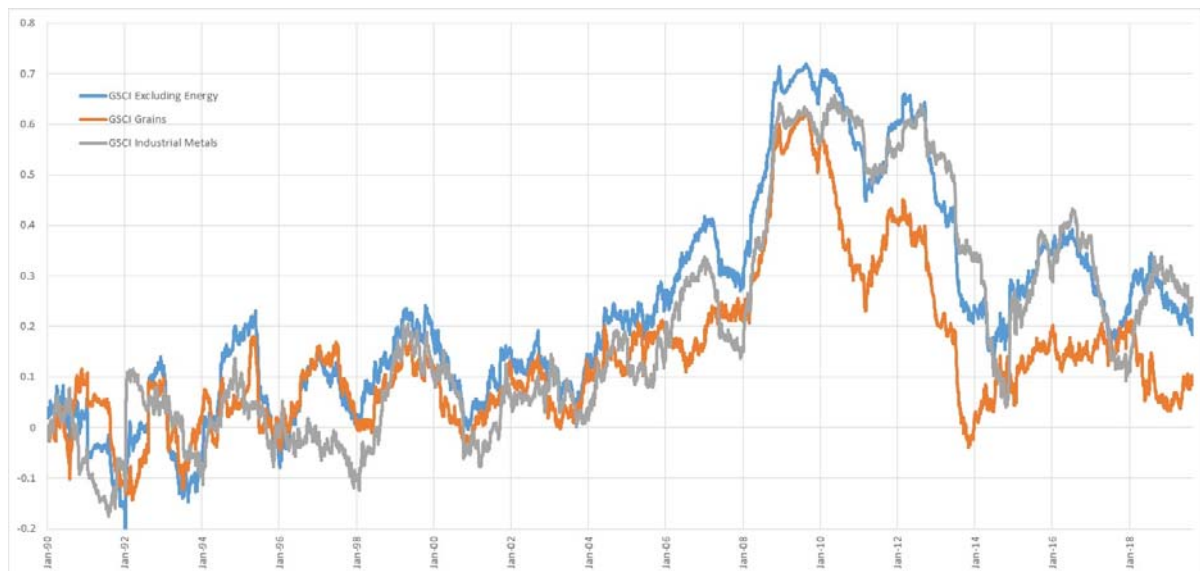


Figure 2. The 252-day rolling correlation of percentage changes in the Goldman Sachs Commodity Index (GSCI) Energy Total Return Index with percentage changes in the GSCI Excluding Energy, GSCI Grains, and GSCI Industrial Metals Total Return indices. Data source: Bloomberg.

Figure 2 shows greatly increased price correlations between different commodity futures. In the 1970s, 1980s, and 1990s, futures prices in different commodity sectors had little correlations with each other. The price correlations turned substantially positive after the mid-2000s, possibly driven by common demand shocks from emerging economies and the large investment flows into commodity investment indices that further drove up the price correlations. These increases in price correlations are not simply a result of the 2008 financial crisis, as the price correlations remained high long after 2008, and remain so even to date.

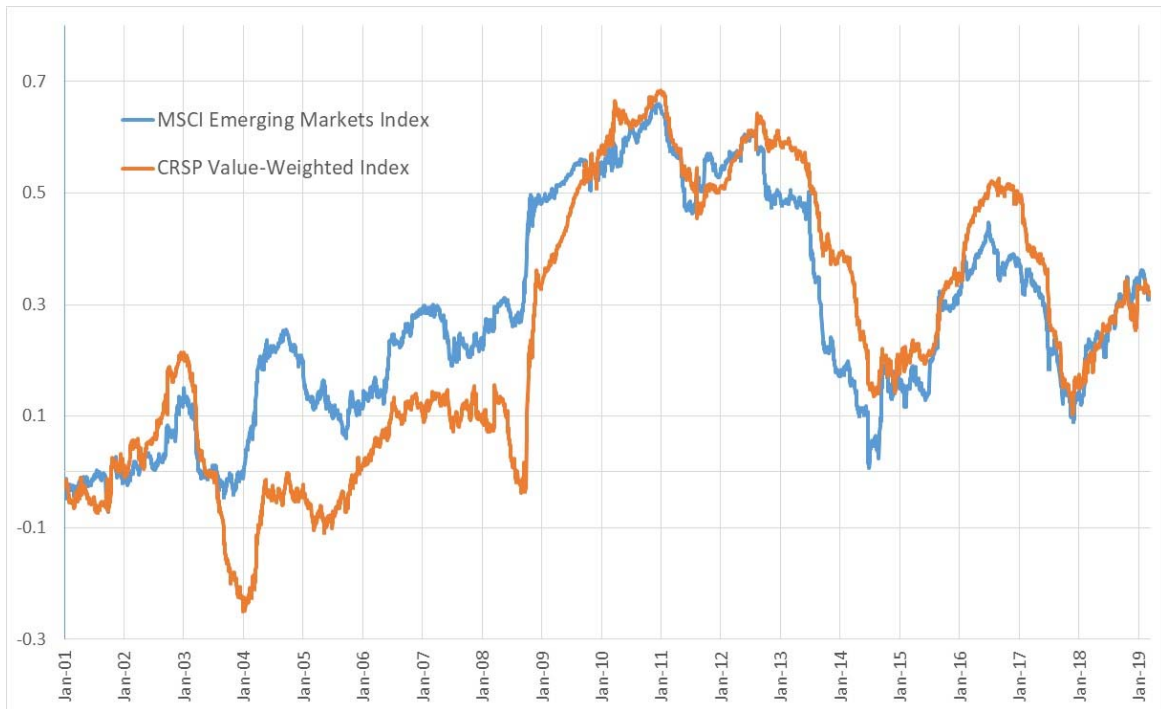


Figure 3. The 252-day rolling correlation of the percentage change in the GSCI Total Return Index with the returns to the MSCI Emerging Market Index and the CRSP US Equity Market Index. Data source: Bloomberg.

Figure 3 plots the correlations of the GSCI commodity futures index with the MSCI Emerging Market Index and the CRSP US Equity Market Index. Overall, there are similar patterns in these commodity-stock price correlations. These price correlations greatly increased from their initially low levels after the mid-2000s, yet the correlations varied dramatically from year to year. This dramatic variation reflects that at a given point in time, a different type of shock might be driving the global commodity markets. The high correlations in the 2007–2008 period were largely driven by the emerging market boom and the large investment flows to commodity futures markets to hedge against the downturn in the advanced economies, while the lowered correlations in the 2014–2015 period was possibly related to the rapid adoption of hydraulic fracking technology that turned the U.S. into an exporter of crude oil.

III. Challenges for monetary policy

Thomas Drechsel, Michael McLeay, and Silvana Tenreyro have developed an excellent model to examine the optimal monetary policy for a small open economy that exports commodities. This model builds in two sectors, a commodity sector and a non-commodity sector. As a global commodity market shock causes commodity prices to increase, the shock drives the commodity sector to expand, and in turn, the increased demand for input leads to a real exchange-rate appreciation in the economy. The externality induced by such an expansion on the terms of trade drives up inflation and misallocation between the commodity and non-commodity sectors. The model also incorporates financing constraints for the commodity sector, which further amplifies the expansionary effects of the commodity price shock on the commodity sector. Building on this nicely constructed model, their analysis motivates an optimal monetary policy of leaning against the commodity market shock. They also provide quantitative analysis of the effectiveness of alternative monetary policy rules. By using data from Argentina, their analysis shows that the welfare differences between several policy rules are relatively small. These are very nice results.

In addition to the terms of trade as the channel for inefficient commodity booms, there is an alternative channel through the labor market. Benguria, Saffie, and Urzúa (2018) recently developed a model to show that a commodity market boom can increase domestic demand and induce wage increases, especially for unskilled workers, thus hurting non-skill-intensive industries. By using data from Brazil, their analysis shows that labor market frictions can lead to persistent unemployment as the boom fades.

To add to the analysis of Thomas Drechsel, Michael McLeay, and Silvana Tenreyro, I would emphasize that not all shocks are the same—different types of shocks to commodity markets, such as supply shocks, demand shocks and investment flow shocks that I mentioned earlier, may warrant different policy responses. I discuss several observations below to reflect on this simple point.

While a demand shock driven by the booming emerging economies may cause the same positive effect on commodity prices as an investment flow shock, the persistence of the resulting price effect can be very different. In particular, the investment flow shock tends to be more transitory. The 2008 commodity market boom provides a vivid example. The U.S. economy already showed substantial weakness by the end of 2007. The U.S. equity market started to decline from its peak in October 2007, and the NBER officially marked an economic recession in the U.S.

starting in December 2007. Despite the economic weakness, the prices of different commodities, such as crude oil, soybeans, and copper, continued to rise in the first half of 2008. Figure 4 shows that WTI crude oil futures prices appreciated by another 50% in this period and peaked only in July 2008.

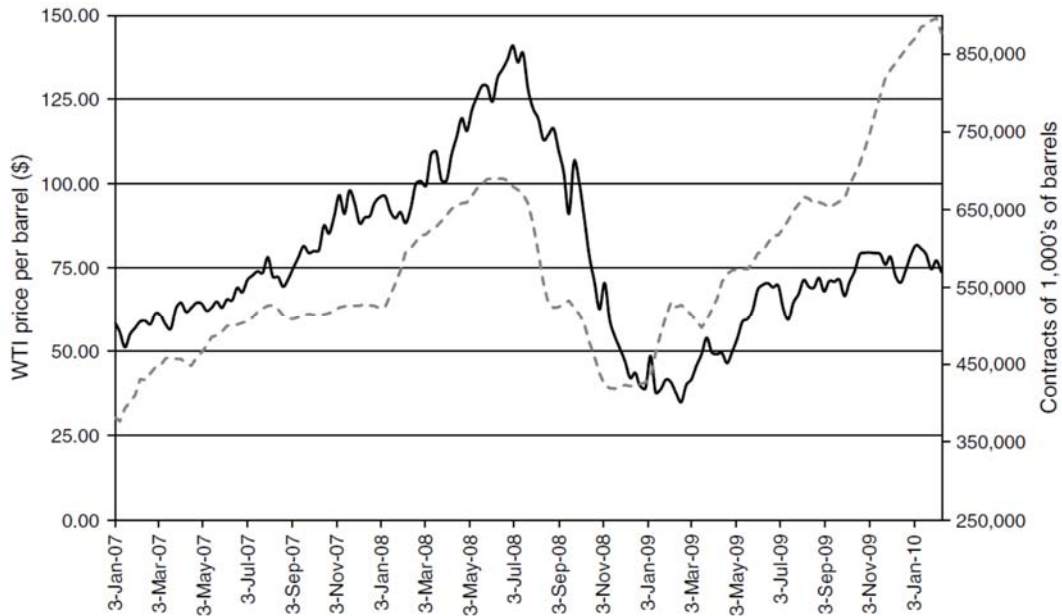


Figure 4: Commodity index long positions inferred from the CIT Reports (dashed line, right scale) and WTI futures price (solid line, left scale). Source: Singleton (2014, Figure 1).

While it was tempting at the time to attribute this surprising commodity market boom to strong commodity demands from emerging economies, ex post it is much easier to explain the boom by recognizing the substantial investment flows into commodities during this period, which were driven by the great appeal of commodity investment as a hedge against the looming downturn in the advanced economies. Singleton (2014) provides an estimate of the investment flow from the so-called commodity index traders (i.e., portfolio managers who allocate part of their portfolios to commodity futures index) to WTI future contracts. Figure 4 shows that the investment flow to WTI futures contracts fluctuated in sync with WTI futures prices. Unfortunately, emerging economies did not prove a reliable hedge against the worst financial crisis in decades, not even for China, whose financial system was mostly segmented from the rest of the world. Commodity

prices eventually crashed with Lehman Brothers after September 2008. This episode nicely illustrates that the effects of investment flow shocks on commodity prices may be transitory, even though they can be powerful and difficult to differentiate from demand shocks at the time.

The difficulty of sorting out different types of shocks is rooted in the lack of reliable statistics of commodity supply and demand across different countries, especially in many emerging economies. Sockin and Xiong (2015) develop a theoretical model to highlight that such informational frictions may have made commodity futures markets a centralized platform for aggregating dispersed information among market participants about the strength of the global economy, thus making commodity futures prices a barometer of the strength of emerging economies. While the standard cost effect implies that a higher commodity price would lead to lower commodity demand, their model suggests an additional informational effect that a higher commodity price may signal a stronger global economy, thus motivating greater commodity demand. This informational effect may dominate the cost effect and lead to an intriguing upward sloping demand curve for commodities in the equilibrium.

The presence of such informational frictions presents a great challenge to policy makers as well as market participants, who need to clearly determine the ultimate driver of a commodity market boom. Interestingly, the ECB raised its key policy rates on July 3, 2008, citing as a key factor the uncertainty created by the very high levels of commodity prices at the time.¹ This interest rate increase appeared imprudent ex post, as it occurred right at the peak of the commodity market boom and only two months before the worst recession to hit the global economy in decades. The ECB soon reversed gears and turned to aggressively reducing interest rates in October 2008. During the same period in 2008, China, the largest crude oil importer in the world, completed the development of a key strategic crude oil reserve of more than 100 million barrels, right at the peak of the oil market boom. This poor market timing was possibly driven by misjudgment of the persistence of the boom.

The increasingly complicated geopolitical environment in the global economy can also make commodity market shocks different from before. Figure 5, taken from a recent USDA report, shows that the trade war between China and the U.S. led to a short-term divergence in 2018

¹ See the ECB statement at <https://www.ecb.europa.eu/press/pressconf/2008/html/is080703.en.html>.

between soybean prices in Brazil and in the U.S., the two largest soybean exporters. As the largest soybean importer, China’s announcement of a tariff on soybean imports from the U.S. in June 2018 led U.S. soybean prices to fall and Brazilian soybean prices to rise. This price gap rose to as much as 28% in September 2018, before the prices in these two countries converged in January 2019. This episode again shows that the persistence of a commodity price shock can be very different depending on its driving force, and, in particular, that a commodity market boom in one country can be very different from that experienced by another country.

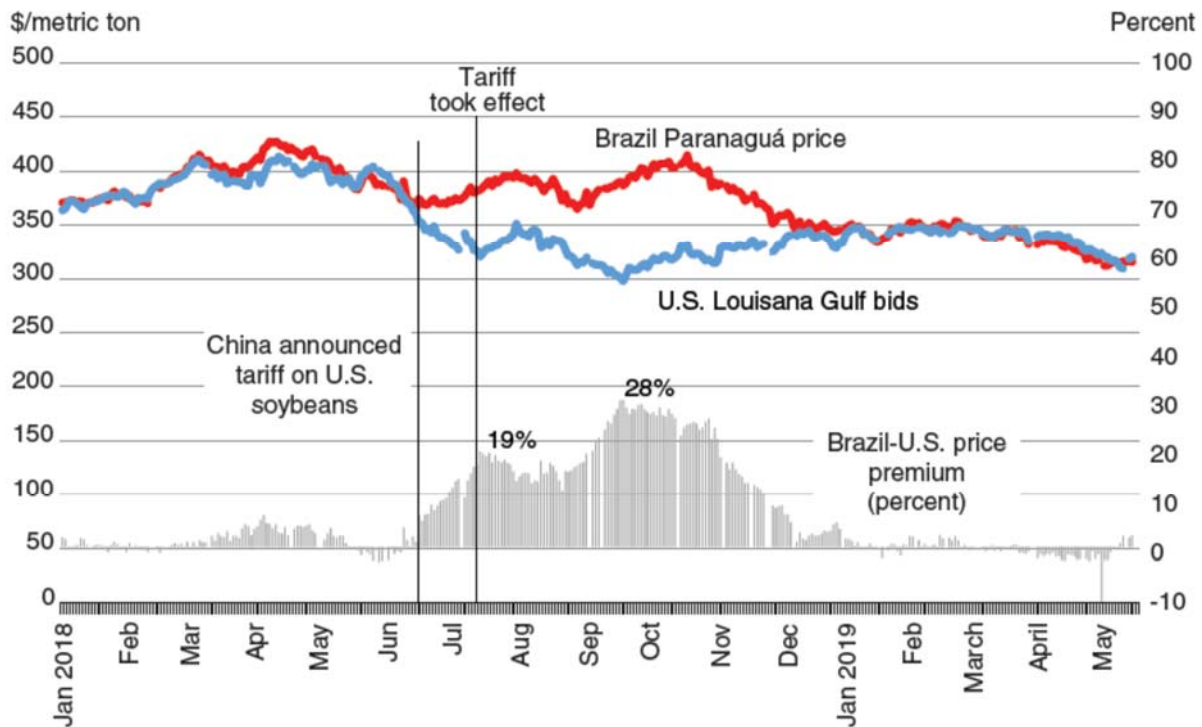


Figure 5. U.S.-Brazil soybean prices in 2018–19. Source: Gale, Valdes, and Ash (2019, Figure 20).

Taken together, it is useful to develop a systematic framework that incorporates the realistic and important learning problem faced by market participants and policy makers in filtering out different shocks to commodity markets on a real-time basis. This is a familiar challenge in monetary policy making. A recent Federal Reserve Board working paper by Leduc, Moran, and Vigfusson (2018) has made some progress in this direction. Specifically, they develop an empirical framework in which investors form expectations by learning about two types of oil market shocks

with different persistence. Their analysis shows such learning can help explain the surprising oil price boom in the spring of 2008, because market participants might have considered that the boom was likely driven by permanent shocks.

IV. Alternative policy instrument

The analysis of Thomas Drechsel, Michael McLeay, and Silvana Tenreyro focuses on using the conventional monetary policy of raising interest rates to lean against a commodity market boom. Note that an interest rate hike is a powerful tool that does not discriminate commodity producers from non-commodity firms. Raising the cost of capital in the whole economy would exacerbate the difficulty imposed by the initial commodity market on non-commodity firms. Furthermore, as already covered by the model of Thomas Drechsel, Michael McLeay, and Silvana Tenreyro, an interest rate hike would also make the home currency more attractive and thus exacerbate the exchange rate appreciation that tends to accompany a positive commodity price shock to a commodity exporting economy. These unintended consequences motivate an alternative policy instrument to mitigate the misallocation caused by a commodity market boom.

One possible alternative instrument would be a macroprudential policy, such as raising capital requirements or risk weights on banks' lending to commodity producers. This type of macroprudential instrument can be used to specifically target commodity producers and thus avoids collateral damage to non-commodity firms. Macroprudential policy is also well-justified during a commodity boom because the boom is likely to lead to substantial increases in financial leverage of commodity producers, as shown by the model of Thomas Drechsel, Michael McLeay, and Silvana Tenreyro.

The implementation of macroprudential policy faces substantial limitations. While it is relatively easy to impose macroprudential constraints on banks and financial institutions, imposing such constraints on capital markets is rather difficult. This limitation may help explain why macroprudential policy has not been used widely by policy makers. Nevertheless, as discussed by Sun (2015) and Wang (2019), the People's Bank of China has been actively using macroprudential policy tools to lean against China's real estate boom, which is a key challenge to China's policy makers, e.g., Liu and Xiong (2019). The lack of well-developed capital markets in China might have been a blessing to the use of macroprudential policy tools. Nevertheless, China's experience

suggests that similar macroprudential policy tools may be useful to other emerging economies that export commodities, such as Argentina, Brazil, and Chile.

V. Conclusion

Let me conclude by summarizing my three main points. First, the global commodity markets have experienced substantial changes in recent years with three types of shocks—supply shocks, demand shocks, and investment flow shocks—jointly driving commodity price fluctuations. Second, realistic information frictions present challenges to policy makers regarding how to differentiate these shocks with suitable policy responses, thus inviting more future studies to develop more systematic frameworks to incorporate learning processes of market participants and policy makers. Third, it could be beneficial to develop macroprudential policy tools as an alternative policy instrument for policy makers to lean against misallocation and distortions created by commodity market booms.

References

- Benguria, Felipe, Felipe Saffie, and Sergio Urzúa (2018), The transmission of commodity price super-cycles, NBER Working Paper #24560.
- Cheng, Ing-haw and Wei Xiong (2014), The financialization of commodity markets, *Annual Review of Financial Economics* 6, 419–441.
- Gale, Fred, Constanza Valdes, and Mark Ash (2019), Interdependence of China, United States, and Brazil in soybean trade, USDA Report.
- Hamilton, James (1983), Oil and the macroeconomy since World War II, *Journal of Political Economy*, 91(2), 228–248.
- Kilian, Lutz (2009), Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market, *American Economic Review* 99(3), 1053–1069.
- Leduc, Sylvain, Kevin Moran, and Robert J. Vigfusson (2018), Learning in the oil futures markets: Evidence and macroeconomic implications, Federal Reserve Board International Finance Discussion Paper 1179.

Liu, Chang and Wei Xiong (2019), China's real estate market, in Marlene Amstad, Guofeng Sun and Wei Xiong (Eds): *The Handbook of China's Financial System*, Princeton University Press, forthcoming.

Singleton, Kenneth (2013), Investor flows and the 2008 boom/bust in oil prices, *Management Science* 60(2), 300–318.

Sockin, Michael and Wei Xiong (2015), Informational frictions and commodity markets, *Journal of Finance* 70, 2063–2098.

Sun, Guofeng (2015), *Reforms in China's Monetary Policy: A Frontbencher's Perspective*, Palgrave Macmillan.

Tang, Ke and Wei Xiong (2012), Index investment and financialization of commodities, *Financial Analysts Journal* 68 (6), 54–74.

Wang, Tao (2019), Monetary policy instruments, in Marlene Amstad, Guofeng Sun and Wei Xiong (Eds): *The Handbook of China's Financial System*, Princeton University Press, forthcoming.