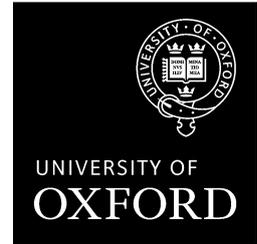


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## **OxCarre Policy Paper 19**

# **Understanding International Commodity Price Fluctuations**

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# Understanding International Commodity Price Fluctuations<sup>1</sup>

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## Abstract

An overview is provided of recent work on commodity prices, focusing on three themes: (i) "financialization" of commodity markets--commodities being considered by financial investors as a distinct asset class, (ii) trends and forecasts of commodity prices, and (iii) fracking—a shorthand for the emergence of new sources of energy supply. Lessons are drawn on the role of fundamentals and expectations in driving the rapidly changing nature of commodity markets.

**JEL Code:** Q43, F02; G15, G28.

**Key Words:** Commodity price; financialization; forecasting; fracking; fundamentals; expectations.

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## **I. INTRODUCTION**

Commodity prices have been on a roller coaster for several years. In 2008, oil prices hit \$145 a barrel and prices of many metals were soaring on the back of demand from emerging markets. High food prices provoked riots in 35 countries and added more than a 100 million people to the ranks of the hungry. The global financial crisis reversed the increase in commodity prices, but they have since rebounded and remained elevated and volatile.

The papers in this special issue of the *Journal of International Money and Finance* foster a better understanding of international commodity price fluctuations. The papers were presented at a conference in Washington, D.C., on September 20-21, 2013 organized jointly by the Research Department of the International Monetary Fund and the Oxford Centre for the Analysis of Resource Rich Economies at the University of Oxford.

In this overview we discuss three the key questions tackled in the papers, panel discussion and speeches: (i) Are commodity prices increasingly being driven by financial speculation?; (ii) Do newer techniques to forecast commodity prices beat a random walk? (iii) What are the economic and environmental impacts of new sources of energy supply?

The remainder is organized as follows. Section 2 discusses the consequences of financialization of commodity markets. Section 3 reviews recent developments in testing the Prebisch-Singer hypothesis and forecasting commodity prices. Section 4 explores the actual and prospective consequences of the spread of the use of fracking technology to extract new source of energy and its consequences on energy prices, the environment and the economy. Section 5 concludes.

## **II. “FINANCIALIZATION” OF COMMODITY MARKETS**

A theme explored in many papers in the issue is the "financialization" of commodity markets -- commodities being considered by financial investors as a distinct asset class. There is debate on whether this increased interest is resulting in commodity prices, particularly oil prices, becoming disconnected from fundamentals.

In principle, the financialization of commodity markets is a welcome development. For instance, in the crude oil market, having investors willing to take long forward exposure can enhance the potential for risk sharing and hedging. It should improve the process of price discovery and contribute to price stability,

helping both producers and consumers. But short-term effects at times may have clouded the longer-term benefits.

Financialization does open up the possibility for noise trading and momentum strategies to affect prices. It remains a matter of debate whether such trading played a role in the acceleration of commodity prices between 2005 and 2008. The papers in this special issue contribute to the debate in several ways by providing: empirical evidence of financialization and quantifying the role of the speculative component in explaining the oil-price spike in the run up to the global financial crisis; a structural explanation for the development in the futures markets for oil and the role of low interest rate; evidence for the role of information and “reflexivity” in driving commodity futures prices; and evidence of the presence of bubbles in the food market.

#### *Evidence of financialization and speculation*

Jim Hamilton of the University of California, San Diego and Jing Cynthia Wu of the University of Chicago provide a structural model linking volatility in the oil futures market to the flow of dollars into commodity-index funds that take the long position in crude oil futures contracts. In Keynes’ theory of normal backwardation, producers of commodities hedge by selling futures contracts and pay a premium. Arbitrageurs are forced to take the other side and are thus exposed to non-diversifiable risk and compensated. When financial investors who buy commodities futures for portfolio diversification get involved, they exert a similar effect to the one describe in Keynes’s theory but in the opposite direction. That is financial investors’ involvement shifts the receipt of the risk premium from the long side to the short side of the contract. The application of the methods developed in their paper to the price of crude oil futures contracts provides evidence that there are significant changes in the risk premia in 2005 as the volume of futures trading grows significantly. Traders taking long positions earned a positive return on average prior to 2005 but that premium decreased substantially after 2005. This is consistent with the claim that, historically, commercial producers paid a premium to arbitrageurs for the privilege of hedging price risk, but in more recent periods financial investors have become natural counterparties for commercial hedgers.

Michel Robe of American University and Bahattin Büyükşahin of the Bank of Canada provide evidence that greater participation by financial investors in commodity futures markets raises co-movement between commodities and equities returns. The evidence supports the hypothesis that commodities are increasingly considered as an asset class on their own alongside equities. The authors use a unique, non-

public dataset of individual trader positions in 17 U.S. commodity futures markets. They show that the correlation between the rates of return on commodities and equities rises with greater participation by speculators generally, hedge funds especially, and funds that trade in both equity and commodity markets in particular. They also find that the predictive power of hedge fund positions is weaker in periods of generalized financial market stress. Their results indicate that *who* trades helps predict the joint distribution of commodity and equity returns. They also give empirical insight on how much speculative activity exceeds net hedging demand.

### *Role of inventories*

The role “speculation” plays in driving commodity prices is still controversial. The behavior of inventories in the run-up to the global financial crisis seems inconsistent with stories in which speculative behavior plays a dominant role in explaining the sharp rise in oil prices. If momentum trading is a primary driver of price trends, one should see a rise in speculative holdings of inventories. But the level of oil inventories has remained generally low. This was so even in the run-up to the financial crisis when allegations of speculation were widespread. In their paper, Lutz Kilian of the University of Michigan and Thomas Lee of the U.S. Energy Information Administration estimate the speculative component of the real price of oil in 2008 when oil prices peaked at \$145 a barrel to be a mere \$5 and \$14 depending on the particular specification of inventories, but they found that there was no evidence of speculative demand pressures between early 2003 and early 2008. To do so, the authors use what they consider to be a natural economic definition of a speculator in the physical market, which is anyone buying crude oil not for current consumption but for future use. Speculative purchases of oil arise in the physical market for oil when the buyer is anticipating rising oil prices. Kilian and Lee argue that a shift in expectations about future excess oil demand manifests itself as a shift in the demand for oil inventories, so that these demand shocks are speculative demand shocks by construction. They find that episodes of increased speculative demand in the physical market for crude oil do not line up at all with increases in measures of the participation of financial investors in oil futures markets. They suggest that efforts to firm up the regulation of oil derivatives markets are unlikely to lower the real price of oil in the physical market.

Jeff Frankel of Harvard University provides a tractable macro-finance model with storable commodities that can accommodate various explanations for recent increases in commodity prices, namely, economic activity, speculation, and easy monetary policy. The stylized fact that in periods when monetary policy is

easy, real commodity prices tend to be high serves as inspiration for his model which is based on two features: (i) “carry trade”, that is, an arbitrage relationship between expected price change and costs of carry (interest rate, storage costs, and convenience yield) and; (ii) “overshooting”, that is, prices are expected to regress gradually back to long-run equilibrium. To test his theory, Frankel uses market-based measures of speculation and market expectations of future commodity price changes. He finds support for the carry trade approach in the form of: (i) a negative effect of inventory levels on commodity prices; (ii) a negative effect of the interest rate on inventory demand and hence on commodity prices; and (iii) a positive effect of expected price increases on inventory demand and hence on commodity prices. Specifically, he finds empirical support for the overshooting model in the form of a negative effect of real interest rate on real commodity prices. Of course, Frankel recognizes that it is difficult to ascertain the causal nature of the relationship but his results provide evidence of empirical association between interest rates and commodity prices.

Eyal Dvir of Boston College and Kenneth Rogoff of Harvard University try to answer a slightly different set of questions about the existence and stability of a long-run stable relationship between the price of crude oil and inventories using monthly data on U.S. oil production, stocks of crude oil, the real price of oil and industrial production going back to the 1930s. To do so, they extend the canonical commodity storage model that predicts the demand for oil and its interaction with the supply regime. If supply is unrestricted, demand growth will cause price to rise only temporarily, and inventories should drop. In contrast, when supply is restricted, demand growth will cause a persistent rise in price, and inventories should rise. The authors estimate a long-run relationship between those four variables during the period 1933-2011 accounting for a break in 1973. The authors argue that supply of oil is inflexible in the post 1973 era whereas it was flexible in the pre-1973 era. The long-run predictions of the model are validated in that before 1973 the relationship between global commercial inventories of crude oil and the price of crude was negative and this relationship was positive after 1973.

#### *Bubbles in food futures markets*

Some behavioral economic theories based on cognitive biases suggest that groupthink and herd behavior can lead to security or commodity prices rising above their true value. Xiaoli L. Etienne, Scott H. Irwin, and Philip Garcia of the University of the University of Illinois test for the existence of bubble-like behavior in agricultural futures markets. To do so, the authors use the daily prices from individual futures contracts. Results show that all 12 agricultural markets experienced multiple periods of price

explosiveness but bubble episodes only represent a very small portion of the price behavior for the 42-year period. In addition, most of the bubbles are short-lived, lasting fewer than 20 days. They also find that explosive periods are more common with longer durations in the first half of the sample period, indicating that the most recent bubble episodes may not have been as severe as the mid-1970s episode. Though receiving far less public attention, results from this study suggest that “negative” bubbles (an unstable situation with expectations for a downturn in the short term only) contribute significantly to price behavior, accounting for more than one-third of total bubble episodes. Of course, results depend on the specific technique used to identify the existence of bubbles, but they are consistent with a basic pattern of sharp increases which are relevant to policy makers considering risk management strategies aimed at reducing the welfare costs of asset price crashes. More research should however try and explore behavioral analysis and structural models to gain a deeper understanding of the emergence and specificities of bubbles in commodity markets.

#### *The role of information and reflexivity*

The efficient market hypothesis states that existing asset prices always incorporate and reflect all relevant information. In the short run, any arrival of relevant news informing market participants about the state of fundamentals should thus move markets. Scott C. Linn and Zhen Zhu both of the University of Oklahoma and Song Zan Chiou-Wei of Nan-Hua University provide empirical evidence of the role of information and in particular of news about fundamentals in explaining commodity price changes. They study the behavior of U.S. natural gas futures and spot prices on and around the weekly announcements by the U.S. Energy Information Administration of the amount of natural gas in storage. Interestingly, they find an inverse empirical relation between changes in futures prices and surprises in the change in natural gas in storage and also find that this relation is not driven by the absolute size of the surprise. They present direct evidence of price discovery occurring in the futures market for natural gas with that information then flowing to the spot market. They find that post 2005, corresponding to a period of significant increases in the production of natural gas in the United States, the response of prices to storage surprises became more negative. Further research could explore more systematically the importance of broad array of news and quantify their effects on gas and other commodity prices depending on their nature (e.g. geopolitical, supply disruption, new discoveries).

In contrast to the efficient market hypothesis, the “reflexivity” theory developed by George Soros based on the ideas of Karl Popper posits that the valuation of any market produces a procyclical virtuous or vicious circle that further affects the market. Vladimir Filimonov, David Bicchetti both of ETH Zurich, Nicolas Maystre and Didier Sornette both of the United Nations Conference on Trade and Development

argue that innovations in trading technology such as high frequency trading, algorithmic trading and herding behavior may have given way to an endogenous dynamic in financial markets or “reflexive” markets. To test for the relevance of the reflexivity theory, the authors construct an index of endogeneity (or reflexivity) that is the average ratio of the number of price moves that are due to endogenous interactions to the total number of all price changes, which also include exogenous events. The reflexivity index is quantified for several commodity futures markets (corn, oil, soybean, sugar, and wheat) and also for a benchmark equity futures market (E-mini S&P 500) and is based on the Hawkes self-excited conditional Poisson model for empirical time series of trades. Results point to an overall increase of the level of endogeneity since the mid-2000s to October 2012, with a typical value nowadays around 0.6–0.7, implying that at least 60–70 per cent of commodity price changes are now due to self-generated activities rather than novel information. More research could explore the specificities of commodities as opposed to other asset and to ground the reflexivity theories in more formal model of bounded rationality and herd behavior.

### **III. SECULAR TRENDS AND FORECASTING COMMODITY PRICES**

Commodity prices are driven by multiple forces and characterized by very long-term trends and shorter-run cycles of varying durations. In 1950, Raul Prebisch and Hans Singer predicted that over the long run commodity prices should decline relative to the prices of manufactured goods. As economies got richer, the relative price of primary products would fall as the demand for these products was inelastic. But many commodity prices have often refused to toe the line. Even over long periods of 100 years or more, many prices do not show clear signs of a secular decline. And periods of decline are often interrupted by long episodes of commodity price booms, as happened over the 2000s. Several papers in this special issue characterize the state-of-art in what is known about trends and cycles in commodity prices. A better understanding of movements in commodity prices should help us forecast these prices better. Several papers in this issue look into new techniques to forecast commodity prices, including using co-movements across commodity prices to better predict movements in individual prices. These papers assess the performance of their new forecast models relative to benchmarks such as random walks or forecasts based on futures prices.

Several papers in the special issue employ new techniques to test the Prebisch-Singer hypothesis and do not find much evidence for a monotonic decline of the relative price of commodities relative to manufactures prices. Instead, they find evidence of structural breaks suggesting that there are events

that lead to fundamental shifts in commodity markets. For instance, the rise of new global economic players such as China and India put upward pressure on commodity prices while new supplies and innovations in extractive and transportation technologies tend to depress commodity prices.

### *Trends in commodity prices*

Gawon Yoon of Kookmin University and Hiroshi Yamada of Hiroshima University extend the sample of the Grilli-Yang data up to 2010 and use it to test whether the Prebisch-Singer hypothesis holds sometimes during the sample period (rather than all the time) by estimating the piecewise-linear trends of primary commodity prices. Using a new method for filtering trends, they find that the Prebisch-Singer hypothesis holds sometimes, but not always, for many of the primary commodities and the hypothesis has become substantially weaker recently.

One issue arising when testing for structural breaks is the number of breaks is overestimated in short samples. Kaddour Hadri of Queens University, Yao Rao of Liverpool University and Rabah Arezki and Prakash Loungani both of the Research Department of the International Monetary Fund address this problem by using very long time series, some of them starting as far back as 1650. They also make use of powerful panel-data stationarity tests allowing for endogenous multiple structural breaks and accounting for cross-sectional dependence across shocks to commodities. The use of panel techniques to test the Prebisch-Singer hypothesis rather than conduct a test on an aggregated index permits an increase in the power of the test and obviates assigning specific weights to series. All the series are found to be stationary. The results of the test of the Prebisch-Singer hypothesis are mixed but with a majority of commodities indicating a negative trend. The authors go on to use a narrative approach to identify the underlying factors behind structural breaks and found for instance dates of the start of the industrial revolution and innovation transportation technology concord with structural break dates. The authors also characterize the time-varying volatility of primary commodity prices and the tendency for volatility to increase in recent years.

John Cuddington of the Colorado School of Mines explores the use of low-frequency band-pass filters for describing long-run trends in real mineral and energy commodity prices. This approach has the advantage of allowing long-run trends rate to evolve gradually over time, rather than assuming that they are constant (perhaps with occasional structural breaks) over time. This is a flexible way of capturing the ongoing ‘tug of war’ between exploration, depletion, and technological change. Over 100 mineral and energy commodities, stretching back to the late 19th or early 20<sup>th</sup> century, are considered. The variety in long-run trends is remarkable. Very few increase monotonically, contrary to the prediction of the basic Hotelling model. Some decline monotonically (as predicted by Prebisch and Singer); some have the U-shaped pattern (as predicted by Pindyck, Heal and Slade, year?). Others have changed direction up to three times

in the period since 1900. The author argues that ‘tug of war’ effects continue with exhaustion nowhere in sight.

In the short run countries affected by commodity price fluctuations may sometime react by introducing subsidies such as petrol subsidies but also biofuels and trade distortions such as food exports bans which may further destabilize international prices. Several papers in the special issue explore the role of such distortions in explaining developments in commodity markets. Fernando Alvalos of the Bank of International Settlements provides evidence of role of the ethanol promotion policies in the United States and the link between oil and corn prices and its substitutes (especially soybeans) using the change in US bio-fuel policy during 2006 as a natural experiment to identify changes in the stochastic processes for the prices of corn and soya-bean. Unexpectedly, he finds an effect of crop prices on oil rather than the other way around.

Will Martin and Maros Ivanic both of the World Bank explore the role of the importance of trade policies that insulate domestic prices from world markets as a source of volatility in world prices. The authors show that these interventions are dynamically more complex than simple proportional insulation. Insulation against an initial price increase increases the magnitude of that increase while subsequent adjustments to the level of protection change the fundamental nature of price volatility. Domestic prices in most countries are frequently no less volatile as a result of such policies, even though countries that are more aggressive in insulating their prices appear to be able to “export” a portion of their price volatility to their trading partners.

### *Forecasting commodity prices*

A better understanding of the drivers of trends and cycles in commodity prices might help us forecast these prices a bit better. Widely used commodity prices forecast suffer from several limitations. For instance, the IMF’s forecasts of commodity prices are based almost entirely on futures prices. There are several limitations to this practice. Futures contracts do not provide much guidance for the medium-run—the contracts either do not go out far enough or the markets are not deep enough. And even for the short run, the predictive ability of futures prices, particularly for metals prices, appears to have declined. Often there are spectacular failures: copper prices rose more than 100 percent between 2009 and 2010, yet 12-month futures predicted a price increase of only 3 percent. This is not an isolated example. Futures prices for many other metals have also doing poorly in predicting spot prices.

Two papers in this special issue explore new techniques to forecast commodity prices, including using co-movements across commodity prices to better predict movements in individual commodity prices. Ken West of the University of Wisconsin and Ka-Fu Wong of the University of Hong Kong looked at whether using information on co-movements of commodity prices can help predict movements in individual commodity prices. The authors fit a factor model to a panel of 10 real commodity prices and use it for forecasting purposes. The factor model forecasts better than a random walk about half of the time and does a little better at short (one quarter) than long horizons (eight quarter).

João Victor Issler and Rafael Burjack both of the Fundação Getulio Vargas and Claudia Rodrigues of Vale study and forecast spot metal price levels and changes at monthly, quarterly, and annual horizons. They confirm existence of comovement between metal prices using common-feature techniques (i.e., the estimation of parsimonious VARs with cointegration restrictions and quasi-structural relationships). They show that combining forecasts is the best strategy to forecast the metal prices. In particular, the best results were achieved when using bias-corrected average forecast and that is true for most metal prices, horizons and frequencies.

#### IV. “FRACKING”—THE CHANGING ENERGY LANDSCAPE

In the United States shale gas has risen from two percent of domestic production a decade ago to nearly 40 percent today. As Dan Yergin recently noted, the increase in U.S. oil output since 2008 is equivalent to the entire output of Nigeria, the seventh-largest oil producing country in OPEC. The economic, environmental and geopolitical impacts of these developments remain unclear and are a matter of much debate. Because there is little academic work on the topic, the conference featured a panel discussion among energy sector experts and a keynote speech on the development and effects of the changing landscape of energy supply. In this section, we try to lay out important dimensions of the phenomenon which we hope will be useful for future research.

##### *Economic consequences of new energy supplies*

Javier Blas of the *Financial Times* and James Hamilton noted that, whether it is in terms of the energy mix in the US, international trade, or greenhouse gas emissions, the effects of new energy sources

are already large and growing rapidly. Hamilton argued that natural gas is gradually replacing coal in U.S. electricity generation. The shale boom was unexpected as can be witnessed from the large investments in LNG terminals to facilitate import of natural gas, but undoubtedly it had something to do with a sustained period of high oil prices which made exploitation of shale gas more profitable. Furthermore, oil and gas prices no longer move in tandem as gas prices are now much lower than oil prices. While gas is a good substitute for coal in electricity generation, substitutability in transport depends on a variety of economic and technical factors. Technology is catching up fast; e.g., recently BNSF Railway has announced tests for locomotives powered by liquefied natural gas and Shell has announced infrastructure to provide liquefied natural gas to ships operating in Great Lakes and Gulf of Mexico.

Jeff Frankel argued that in the short run those new energy sources may supply jobs in the United States at a time of high unemployment. In the medium run, he argued that those new energy sources may lead to “re-shoring” of manufacturing to North America. In the long run new really cost-effective energy sources will lower the United States’ vulnerability to future oil shocks and will be a good thing for national security too. The development of new energy sources will also impact U.S. external balance vis-à-vis the rest of the world, thereby potentially reducing global imbalances.

Karen Harbert of the U.S. Chamber of Commerce argued that given the rapidly rising demand for energy including electricity generation in rapidly developing countries such as China and India, new energy sources represent not only an opportunity for the United States but for the world as a whole. They will also change geopolitical power relationships in a fundamental way and will hopefully lessen the pressure for military interventions to safeguard supplies of crucial energy sources. *Environmental consequences*

Some environmentalists fear that shale gas and tight oil may crowd out renewable energy sources and also fear local risks for instance to water supplies and methane leaks. Jeff Frankel noted, however, that it is difficult to think about ways to reduce green house gas emissions without substantially curbing the use of coal. Hamilton presented evidence that natural gas is replacing coal in US electricity generation, and that US green house gas emissions have unexpectedly peaked. Frankel also argued that natural gas should be regarded as a bridge while we await renewable energies, nuclear fusion or other alternatives becoming economically viable. The shale gas boom may give us several decades of breathing space to develop the zero-emissions technologies that are needed, whilst immediately substantially reducing carbon emissions by shifting away from coal in electricity generation and away from oil in transport.

### *Policies*

In a keynote address, Christof Rühl of BP noted that the development of new energy sources has so far been limited to the United States and Canada. He explains this by both the legal environment in the

United States granting land owners the right to dispose of underground wealth, and the presence of small and innovative businesses. These businesses have developed know-how and expertise which then attracted the attention of major oil companies which are able to scale the developments. These considerations suggest that other countries may be less successful in exploiting their deposits of shale gas and tight oil. In Europe some have a fear of new and unfamiliar technologies, which goes under the name of the “precautionary principle,” and which often forgets to compare the worst-case risks of the new technology with the known downsides of the old technologies. Furthermore, subsidies to renewables (such as the huge subsidies for solar energy in German electricity generation) suffer from two problems compared with the first-best approach of pricing carbon either via a global carbon tax or a global emissions market. First, by subsidizing say solar instead of wind or some hitherto unknown technology the government is picking winners and thereby hindering the development of potentially more cost-effective renewables; it may also create lobbies of vested interests which will cling to these technologies. Second, renewables subsidies are seen as expropriation by oil and gas producers who will therefore speed up depletion of their reserves which will accelerate global warming (the so-called Green Paradox).

Energy policy must take into account the three externalities: macroeconomic stability, environment, and national security. There is need for high-quality environmental and safety regulation with an emphasis on enforcement to make sure that happens. The lessons learned from the development of those new energy sources suggest that it is important that carbon is priced appropriately; taking into account environmental and national security externalities, the market will respond appropriately. Government mandates and subsidies for specific technologies or specific energy sources are not needed. The best technologies will reveal themselves, and often they will be things that weren’t even on our lists.

## V. CONCLUSION

The papers assembled in this special issue have made progress in understanding some of the interplay of factors that determine commodity prices. Fundamentals matter, including long run demand growth, technical change that opens up new sources of supply, changes that transform the operation of financial markets, and macro-economic shocks. The endogenous responses of private investors – both real and financial – matter. These are shaped by expectations, both of fundamentals and of shorter-run price movements. It takes powerful economic and econometric techniques to disentangle these effects, and the papers in this volume provide examples of the insights that can be gained by applying these techniques. Overall, the papers assembled in the issue make great progress in reasserting the role of fundamentals and understanding better the financial side of commodity markets, including through providing structural explanations of what drives these markets.

The actions of policy makers are also important, and often have far reaching consequences. Low interest rates feed into investment strategies, and measures to protect domestic consumers from price-spikes have implications beyond the domestic economy. While fundamentals are the primary drivers of commodity prices, the financial sector should be oriented to enhance price discovery and to provide the hedge that real sector actors need. A keynote address by Chairman Gary Gensler of the Commodity Futures and Trade Commission (CFTC)<sup>2</sup> argued that this requires an effective regulatory body with oversight authorities and regulation to limit fraud, manipulation and other abuses. The regulatory response in the United States is attempting to just do that. As required by Congress in the Dodd-Frank Act, in October 2011 the CFTC finalized a rule to establish position limits for futures, options and swaps on 28 physical commodities. In the United States, there are strong prohibitions against misconduct that can affect the integrity of markets, which were further strengthened by Congress in the Dodd-Frank Act. Beyond the United States, there is a need for international coordination. The G-20 leaders endorsed an International Organization of Securities Commissions (IOSCO) report noting that market regulators should have and use formal position management authorities, including the power to set position limits, to prevent market abuses. Most jurisdictions with commodity derivatives markets have subsequently moved forward on position management authorities. Chairman Gensler highlighted the need for a consistent approach to these reforms.

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<sup>2</sup> See link to Chairman Gensler's address: <http://www.cftc.gov/PressRoom/SpeechesTestimony/opagensler-137>