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WORKING PAPER

Improving Energy Market Regulation

Domestic and International Issues

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Acronyms

APEC	Asia-Pacific Economic Cooperation
CCP	central counterparty clearing
CERM	Coordinated Emergency Response Measures
CFTC	Commodity Futures Trading Commission
CME	Chicago Mercantile Exchange
COT	Commitment of Traders
CPOs	commodity pool operators
CTAs	commodity trading advisors
ETFs	exchange traded funds
FSA	United Kingdom's Financial Services Authority
FINRA	Financial Industry Regulatory Authority
GDP	gross domestic product
G20	Group of Twenty
HH	Henry Hub
IASB	International Accounting Standards Board
ICE	Intercontinental Exchange
IEA	International Energy Agency
IEP	International Energy Program
IOSCO	International Organization of Securities Commissions
JODI	Joint Oil Data Initiative
NYMEX	New York Mercantile Exchange
OECD	Organization for Economic Cooperation and Development
OLADE	Latin America Energy Organization
OPEC	Organization of the Petroleum Exporting Countries
OTC	over-the-counter
SEC	Securities and Exchange Commission
TRACE	Trade Reporting and Compliance Engine
USO	United States Oil Fund
UNG	United States Natural Gas Fund
WTI	West Texas Intermediate

Introduction

High commodity prices are back. Benchmark West Texas Intermediate (WTI) crude oil prices, after flirting with all-time highs near $150 per barrel in July 2008, plummeted in a spectacular fashion to lows near $30 per barrel by the end of the year. Yet within six months, oil prices strongly rebounded. Today, they are nearing $100 per barrel again.

Such extreme price highs and volatility, albeit unusual, can place severe pressure on the U.S. and global economy. Consumers are burdened with steeper food, gasoline, electricity, and heating bills. Higher energy prices can also drive inflation, with broader economic consequences. Some may welcome volatility when it means that prices are falling, but volatility is bad for the overall economy: it introduces business uncertainty to many industries exposed to commodity price risk, such as automobile manufacturers, airlines, farmers, mining companies, and refineries. The uncertainty deters the private sector from making needed investments in infrastructure and equipment, thereby destroying jobs and weakening the drive toward energy conservation and efficiency.[1]

Many observers have been quick to note that rapid rise and volatility of energy and other commodity prices has coincided with a remarkable surge in activity in commodity financial derivatives. Financial open interest (the number of outstanding contracts) in benchmark WTI crude oil contracts on the New York Mercantile Exchange (NYMEX) rose from the equivalent of 700 million barrels of oil in 2000 to over 3.3 billion barrels at its peak in 2008. These numbers do not reflect growth in the even larger and unregulated market for over-the-counter (OTC) commodity swaps. In response, many politicians and market commentators have blamed financial "speculators" for causing the energy crisis, pointing to the coincidence of this growth in market activity, the proliferation of investment, and the rise in prices. As a result, they have called for stricter regulation of commodity financial activity. Already the U.S. government has responded on multiple fronts within Congress and the executive branch, culminating in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. The act mandates the centralized clearing of standard OTC contracts and the empowerment of the CFTC and the SEC to provide margin, capital, and reporting requirements for all designated market participants.

But commodity markets are globally integrated and international policy coordination is required for effective market regulation. French president Nicolas Sarkozy intends to use his leadership in the upcoming Group of Twenty (G20) meeting in Cannes to push for improved regulation and supervision of commodity markets. This agenda builds upon previous pledges for cooperation at the 2009 summit in Pittsburgh and the 2010 summit in Seoul.

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And yet both in the United States and internationally, essential details of the new regulatory landscape still need to be fleshed out, particularly in five major areas: physical transparency, market transparency, centralized clearing and standardized contracts, capital and margin requirements, and position limits.

Action is essential, but policymakers need to be wary of being too aggressive. Many experts have discounted the ability of purely financial investors to affect commodity prices.[2] Instead, they argue that since market futures contracts are linked to physically deliverable commodities, financial prices are reflecting fundamental supply and demand. They argue that any oversight and regulation would distort market prices away from fundamentals, harming market efficiency.

Reality is more complicated than either ideological extreme, and both blanket hostility toward speculative activity and unbridled faith in deregulated markets preclude intelligent efforts to improve markets. Policymakers in the United States and in the G20 countries should prioritize those areas that are better understood to unambiguously improve market efficiency, particularly better physical and financial transparency and comprehensive centralized clearing requirements. They should seek international cooperation to better provide global transparency and prevent regulatory arbitrage, both of which are highly desirable. But policymakers must also recognize that these initiatives face substantial logistical and political challenges, making the goal of full international collaboration a stretch. If political constraints preclude multinational coordination, the United States must proceed unilaterally to improve the efficiency of energy financial markets within its jurisdiction.

PHYSICAL TRANSPARENCY

The United States should not aim to manage energy prices. There has been a long history of failed government attempts at price management and controls, such as the gasoline price caps during the Nixon administration and the buffer-stock stabilization attempts by Latin American commodity exporters during the 1960s and 1970s.[3]

Indeed, the consumption and production of commodities are notoriously insensitive to prices: small surpluses or shortages in the physical market must translate to large swings in market prices in order to sufficiently adjust demand and supply to absorb the imbalances.[4] Commodity markets will thus inevitably feature large and unavoidable price swings. Forcibly suppressing them would only harm the efficient functioning of markets.

Yet this does not mean that all price swings are fundamentally justified or desirable. The textbook role of a market price is to adjust to find the appropriate price level to equalize required demand for an economic good with available supply. The most basic ingredient for stable and efficient price discovery is public and credible information on the sources of demand and supply.

The current state of transparency in the energy world, however, is decrepit. For example, take oil markets. According to the U.S. Department of Energy, only a handful of advanced economies in the Organization for Economic Cooperation and Development (OECD) provide any timely statistical releases on their oil demand and supply balances. Altogether they account for less than 55 percent of the world's oil consumption as of 2009.

Furthermore, transparency in oil demand is expected to deteriorate quickly. According to the International Energy Agency's (IEA) World Energy Outlook for 2010, total world oil demand is projected to grow from 84 million barrels a day in 2009 to 107 million barrels a day by 2035, an increase of 27 percent. All of that incremental increase is projected to come from outside of the OECD, where

transparency is much poorer, decreasing the OECD's share to only 39 percent of global consumption.

Data on the supply side of the equation is similarly poor, with the OECD accounting for perhaps 22 percent of the world's crude oil production. Market production share is dominated by the Organization of the Petroleum Exporting Countries (OPEC) nations and the states of the former Soviet Union, none of which are particularly transparent. Together, they comprise 61 percent of world production. Even worse, while world oil demand is aggregated from the decentralized needs of millions of individual consumers and, therefore, has at least some relationship to economic growth, production from OPEC and the former Soviet states has often been subject to the whims of unstable and autocratic regimes and military disruptions.[5]

Most mature financial markets have—after the hard lessons of numerous panics and accounting shortfalls—made a point to provide full, timely, and accurate accounting disclosures publicly available. An investor in U.S. equity markets, for example, may when formulating a fair price freely look up the cash flow, asset, and liabilities of a company by reviewing their SEC filings.

Energy market traders have no such recourse. Instead, they must extrapolate from incomplete, infrequent, and often inaccurate data to make intelligent guesses of the appropriate equilibrium price level.[6]

In an ideal world, the U.S. government could fix this problem by mandating physical transparency requirements from all companies that produce or consume oil traded on U.S. markets, just as it requires transparency from companies that are publicly traded in the United States. Yet this confronts a fundamental problem: the prices of U.S.-traded oil contracts depend on the global balance between oil demand and supply, but the United States lacks the regulatory reach to require transparency on a global scale. Physical transparency in commodity markets is thus a foreign policy problem.

The United States should seek an international framework to apply and enforce a set of consistent reporting standards for all significant oil consuming and producing countries.

Demand

On the demand side, the U.S. goal should be to expand the scope and activities of the IEA, an intergovernmental organization established under OECD auspices to act as an energy policy adviser for its member constituents. The IEA provides an initial framework to address physical transparency demands from most of the world's oil consumers.

Currently, within the IEA, only the United States and Japan provide weekly disclosures of their respective energy balances. The European Union only provides monthly disclosures, and some other member nations provide none at all.

The United States should press the IEA to promulgate guidelines for weekly disclosures of the level of inventories, imports and exports, domestic production, domestic refinery throughput, and demand, much like the information currently presented by the U.S. Department of Energy's Energy Information Administration. It should then work with other member nations to ensure that they comply.

Yet that would still leave a major gap: the lack of representation by China and India at the IEA. This may be understandable given the relationship between the IEA and the OECD. But their absence is glaring. The IEA projects that primary energy demand from China and India alone will contribute over half of the growth in world demand through 2030, and China, already the world's largest

energy user, will surpass the United States as the world's largest oil consumer by 2035. It is impossible to form a complete picture of world energy consumption patterns while excluding China and India, not to mention other middle-sized and fast-growing consumers such as Brazil, Russia, and others.

The United States should encourage the IEA to extend special membership (and similar data reporting requirements) to any nations that represent a significant share of global consumption. Ideally, the initiative would strive for as comprehensive a representation as possible: for example, it could include all consumers whose demand exceeds a floor of one million barrels of oil per day or 1 percent of global consumption. Securing the participation of China and India, which represent the largest sources of expected new demand growth going forward, would be a significant first step.

Though straightforward to describe, there are significant obstacles to moving forward on these initiatives. The incentives that policymakers possess to persuade recalcitrant nations to provide credible physical data transparency are rather limited, and there are important reasons why some countries might resist. A weekly data collection and publication process into a nation's multilayered petroleum complex represents a significant investment in resources. Furthermore, such transparency initiatives may also require substantial philosophical shifts, such as persuading China's secretive National Development and Reform Commission to release sensitive data on Chinese strategic petroleum stockpiles. And it is not only the potential new members that might object: there may be resistance from incumbent members of the IEA, many of which strove to gain a coveted membership in the OECD and do not wish to see the hard-won perks of membership extended to non-OECD members.

Yet it behooves U.S. policymakers to invest significant effort in persuading both new special members and existing members that the gains from globally improved market transparency exceed the costs of adjustment. Membership in the IEA ostensibly comes with a variety of benefits that should incentivize participation, including access to research, data, and technical advice. More concretely, IEA members participate in the International Energy Program (IEP), including cooperation in so-called Coordinated Emergency Response Measures (CERM). Under CERM, the IEA members promise to jointly coordinate emergency stockpile drawdowns.

Critics might argue that the global fungibility of oil markets means that most countries have no incentive to cooperate: they can free-ride on the drawdowns of others in the event of an external physical disruption and concentrate on domestic disruptions. However, during an emergency, being part of an international coordinated response can calm world market prices much more effectively than an isolated response by the domestic stockpiling agency.

Coordinated responses may also provide additional flexibility to respond to a wider variety of disruptions. For example, in 2005 and the aftermath of Hurricane Katrina, the U.S. Strategic Petroleum Reserve, containing only crude oil, was unable to cope with disruptions to the refining complex and potential shortages of refined products. Indeed, offers of crude oil went untaken due to lack of demand. However, coordinated releases of product from the stockpiles of Europe and other IEA members managed to satisfy needs for gasoline and other products. This demonstrated not only the need for a diversified stockpile but also the benefits of cooperation.

Policymakers should be modest, though, about the possibility of realizing full consumption data transparency within the IEA. If international politics preclude a focus on that OECD-linked institution, U.S. policymakers should be willing to jettison the IEA framework in favor of a new structure.

Given the IEA's existing record and long expertise in energy data, however, this would not be an optimal solution.

Supply

On the production side, the Joint Oil Data Initiative (JODI), created in cooperation by six international organizations (Asia-Pacific Economic Cooperation [APEC], Eurostat, the IEA, the Latin America Energy Organization [OLADE], OPEC, and the UN Statistical Division), shows potential.

JODI, launched in 2001, presents a voluntary data questionnaire on demand, supply, inventory, and refinery throughput to all participating countries each month, requesting data for the most recent two months. The initiative has attracted over seventy nations as participants, representing 90 percent of global oil demand and supply.

The OPEC nations participate in this initiative, which is particularly significant, given their importance in global production. China and India's participation is also significant, though China still declines to provide inventory levels.

Nevertheless, even JODI staff members acknowledge that there is much room for improvement, both organizationally and technically. In terms of organization, JODI is purely voluntary. There is no penalty for omitting or refusing to submit data. The data submissions are not subject to third-party review or public scrutiny of their collection processes, leading to questions about the credibility and accuracy of the data. (Responses from the top thirty consumers and producers have, thus far, been reasonably consistent with other official sources, though that is no guarantee that those official sources are accurate either.) Furthermore, members of OPEC, who operate an imperfect oligopoly and receive official production quotas, are sorely tempted to fudge official production reports when expedient. And perhaps the biggest omission from JODI's questionnaire is lack of data on oil reserves. While imprecise and difficult to measure and confirm, estimates of recoverable reserves form a crucial role in formulating market expectations of long-term price trends.[7]

OPEC nations are tempted to tweak official reserve amounts to justify extra quota allocations, just as they manipulate reporting of actual production levels. For example, in 1984, Kuwait abruptly raised its official proven reserves from 67 billion barrels to 93 billion barrels. Other nations—such as Saudi Arabia, the United Arab Emirates, and Iran—determined to maintain their own quota levels, followed suit. All told, in the space of five short years from 1983 to 1988, official OPEC reserves grew by an incredible 286 billion barrels. Nor is this behavior a thing of the past. As recently as 2008, Venezuela revised its official reserve levels upward by 73 percent to 172 billion barrels.

Given OPEC's complicated internal dynamics, acquiring and publicly releasing credible data on global oil reserves will be an uphill battle. However, OPEC's leadership and active participation in JODI generates some room for optimism. In particular, Saudi Arabia, long seen as the guiding "central bank" of oil, was chastened by the market's indifference to its announcement of substantial production increases during its emergency Jeddah summit in 2008.

As on the demand side, the United States has limited leverage when it comes to encouraging transparency from suppliers. Once again, it should focus on promoting the benefits of transparency. It should argue that oil producers, given their economic reliance on oil revenues, have a stronger vested interest than anyone in seeing oil markets become less volatile and more stably tied to their fundamental values. At a minimum, this requires market participants to have access to credible data on its production. It is possible that physical transparency alone may not be sufficient for efficient

price discovery, but it is undoubtedly necessary. More research is needed to determine how much physical transparency by itself can reduce volatility. The OECD and OPEC should research this together in order to enhance the credibility and confidence in the results.

Achieving physical transparency on energy market fundamentals presents a surprisingly difficult logistical exercise and a thorny foreign policy challenge. Nevertheless, given the limitations of U.S. jurisdiction, the cooperation of international regulators and governments is essential for a truly robust regulatory regime. And relative to many other available tools, physical transparency initiatives are sufficiently modest, straightforward, and feasible with common interests across the consumer/producer and advanced/emerging economy spectrum to merit a high level of priority by the U.S. government. The goal of physical transparency may thus serve as a staging ground for further international cooperation on other more controversial regulatory initiatives.

Nevertheless, the U.S. government should be prepared to face disappointment and move ahead with other initiatives designed to enhance market efficiency within its borders, such as financial transparency and clearing and capital/margin requirements in U.S.-based exchanges alone.

FINANCIAL TRANSPARENCY

The fact that commodity financial contracts are ultimately linked to physical commodity markets should not blind people to the fact that they are traded by financial agents, and that the majority of contracts are not physically delivered.

In a perfect world, market forces would immediately arbitrage away any differences between market prices and those that clear physical demand and supply. But in practice, financial market prices can be distorted by behavioral idiosyncrasies, short-term liquidity constraints, and other imperfections. Hence, there is scope for the intelligent market regulator to improve the transmission of fundamental information into financial prices.

The systemic crisis unleashed by the failure of Lehman Brothers in 2008 also warned policymakers and market participants alike of the dangers of insufficient transparency on holdings of OTC contracts, which triggered a cascading loss of confidence in financial counterparties. Nearly all market observers agree in principle that improvements in the level of financial transparency in previously opaque OTC markets, including commodity swap contracts, can be useful to restrain systemic risks.

As with physical transparency, certain financial transparency initiatives hold great potential for improving market efficiency and deterring excessive risk-taking and market manipulation. However, policymakers must also be alert to the real trade-offs inherent in substantial transparency initiatives and to the political opposition that will be engendered from the affected interests.

To achieve improved financial transparency, policymakers should improve the quality of statistical reporting and make statistics more accessible by creating a real-time data depository.

Statistical Reporting

Already, in the United States, the CFTC has made great strides to provide more public and higher-quality data on commodity financial markets by creating and releasing new disaggregated Commitment of Traders (COT) reports on a weekly basis since September 2009. These new reports offer a finer decomposition of trader's holdings than previous reports, separating traders into the following four categories: producer/merchant/processor/user; swap dealers; managed money; and other re-

portable. For each category, the CFTC provides the amount in long, short, or spread (offsetting long and short) positions.

A producer/merchant/processor/user is defined as an entity that physically handles commodities and ostensibly uses futures markets to hedge risks from these activities. Typical examples in the energy space would be an oil producer, a refinery, an airline, or a pipeline operator. Swap dealers are defined as entities that deal primarily in swaps for a commodity and use futures contracts to manage their swap exposure. Typically, large investment banks play an important role as swap dealers managing commodity financial exposure for their clients, which can include traditional producer/users but also hedge funds and other financial speculators. Money managers, including commodity trading advisors (CTAs) and commodity pool operators (CPOs), are defined as financial entities managing, conducting, and organizing future trading. This class arguably comes closest to the "financial speculator" often mentioned in the press. But it is important to note that a large proportion of speculative positions, including those from institutional investors into commodity indices, are likely made through swap contacts and show up in futures markets only through swap dealers. Lastly, other reportables are the remaining reportable traders that are not placed into the one of the first three categories.

While a vast improvement from the previous classification of market participants simply into commercial and noncommercial categories, there are still considerable shortfalls to the new disaggregated COT reports. First, as the swap dealer category itself suggests, the COT reports cover only the futures market and not the vast and largely opaque OTC swaps market, which often trades "look-alike" contracts similar in function to standard futures contracts. The CFTC should also compile and publish similar statistical reports to at least the standardized swap contracts now mandated to trade through centralized clearing houses.

Second, the producer/merchant/processor/user and swap dealer classifications are still overly broad. Consider an example: an oil producer typically hedges by selling short some futures contracts to lock a price for a set amount of sales. By contrast, an oil consumer, such as an airline, typically hedges by buying long some futures contracts to lock in a price for a set amount of purchases. Together, a category that includes oil producers and consumers would see the natural shorts positions of producers and the natural long positions of consumers cancel each other out, making the net positions reported under this category difficult to interpret. The CFTC should thus require reporting that is further disaggregated into producers, users, and processors, in order to prevent the washing-out of natural long and short positions.

Similarly, the swap dealer category may wash out many offsetting long and short positions held by the counterparties of the swap dealers. Hence, the CFTC should also require that swap dealers record and report those positions made on behalf of commercial operators, managed money investors, or other swap dealers.

The reports are also silent on the timing of the financial exposure, known as the "term structure." For example, current COT reports will not be able to distinguish between money managers forming large long positions in short-term natural gas contracts, in response to, say, expectations for a temporary heat wave, versus long positions in long-term natural gas contracts in response to expectations for increased demand from China. But this difference matters to market stability. For example, Metallgesellschaft AG, an energy wholesaler, failed in 1993 due to the unsustainability of the term structure of its risk management. The large size of its losses (roughly $1.5 billion in 1993 dollars) and the forced liquidation of its massive positions caused systemic tremors throughout the financial system.

This stresses the need for regulators to have a clear understanding of the term structure of aggregate commodity risk held by financial participants.

Real-Time Data Depository

In addition to improving the quality of statistical reporting, the CFTC should also ensure that such statistics are released to the public in a timely fashion. One far-reaching suggestion for further financial transparency is the introduction of a real-time post-trade data repository, akin to the Trade Reporting and Compliance Engine (TRACE) introduced into the corporate bond market in 2002 by the U.S.-based Financial Industry Regulatory Authority (FINRA).[8]

A real-time post-trade data repository would publicly report the date, time, trade size, price, and counterparty identities moments after every transaction. Not only would this shed light into opaque markets and alert regulators of potentially dangerous risk-taking behavior, but a real-time data repository promises to reduce price volatility by anchoring prices to the terms of previous transactions. For example, any rational customer would refuse to buy a crude oil contract at a price very different from $20 a barrel when he knows that literally minutes ago a customer before him paid precisely that.

Furthermore, a real-time data repository would lower the customer costs of executing commodity financial transactions, potentially allowing more cost-effective risk management by physical companies wishing to hedge commercial risk or retail investors seeking exposure. The introduction of TRACE into the corporate bond market provided a natural experiment for financial economists to study the impact of such transparency on liquidity and market efficiency.

Multiple studies have found that TRACE has improved liquidity, but only in a narrow sense of reducing trade execution costs.[9] Market liquidity, a term often used loosely by policymakers, can mean multiple things. It may mean the degree of market "tightness," or the cost required to execute a transaction immediately, generally measured by the spread between offer price faced by a buyer and the bid price faced by a seller. But liquidity can also mean "depth," the ability of markets to absorb large buy and sell orders with minimum impact on prices, or "resiliency," the speed to which market prices recover from an unexpected order.

According to TRACE's example, a real-time post-trade data repository for commodity OTC contracts will significantly reduce market tightness, or the average execution cost faced by a customer. This also means that market makers, who reap the spreads between bid and ask prices, will lose the economic rent they extract from less-informed customers.

Although few politicians may lose sleep at this prospect, there are longer-term tradeoffs to consider. First, by reducing the option value of holding contracts in the prospect of closing a trade, real-time reporting disincentivizes dealers from holding inventory to execute large trades. Thus, liquidity gains in reducing market tightness may be offset by lost market depth.

Corporate bond traders have complained that, in the post-TRACE environment, they have been forced to communicate with multiple counterparties when sizeable transactions previously were clearable with a single dealer with sufficient inventory. The resulting complexity may weaken overall trading activity and contribute to a denser web of counterparty transactions that will magnify systemic contagion.

Also, market participants have expressed concern that stringent post-trade reporting will harm effective risk management by making it costly to hedge away risks. Swap dealers regularly offload the

risk of a large OTC transaction by quietly dissecting it into multiple complementary trades that minimize market turbulence. With a real-time data repository advertising a large transaction (and by implication, the impending need for offsetting hedge transactions) minutes after execution, it may be impossible to risk-manage transactions discretely.

And finally, over the long run, reducing the rents that market makers earn in a particular market incentivizes them to seek more lucrative business elsewhere. Some have argued that TRACE may have contributed to the shift of trading and market-making interest away from the corporate bond market and into the then new and opaque market for credit default swaps, with ultimately fatal results. Similarly, imposing post-trade transparency may potentially drive trading activity into new markets currently out of regulatory purview, incubating a new systemic crisis. Furthermore, financial institutions may simply decide to relocate the same activity into different jurisdictions overseas—such as to London's Intercontinental Exchange and Dubai's Mercantile Exchange—where it might face less onerous regulatory scrutiny. This exodus, some have argued, may in turn threaten the primacy of U.S. financial centers in the competitive global landscape.

Despite these downsides to regulation, concrete and coordinated steps have been taken in the past year, both domestically and internationally, to promote more market transparency. Both the House and the Senate have passed bills featuring data reporting requirements for OTC markets. In an open letter to both U.S. and foreign regulators dated June 2009, a large number of the most important financial institutions promised to implement data repositories for a variety of OTC contracts, such as credit-default swaps, interest rate, and equity derivatives. The International Organization of Securities Commissions (IOSCO) created a task force on the commodity futures market, which in March 2009 pledged greater transparency and market surveillance, as well as enhanced global regulatory coordination.

Many have expressed concern that these steps are unwise, pointing to the various problems described above, and, in particular, to the risk of flight to less-regulated countries. But such fears are overblown and poorly justified. Certainly, market-makers would lose economic rents, damaging their profits. However, these losses may be more than offset by gains in volume, as all other participants—speculators and commercial operators alike—should be attracted to the more transparent and liquid financial system. If anything, improved financial transparency would attract more activity rather than repel it. Indeed, improved transparency and liquidity may be critical to maintaining the strategic competitiveness of U.S. financial markets versus foreign peers.

Some financial participants may also shirk transaction reporting requirements, feeling the value of their transactions would be endangered by making them public and known to counterparties. However, this can be properly managed by keeping the data releases both anonymous and not strictly in real time.

The United States should proceed unilaterally with data repositories for exchanges and clearing houses that record every transaction in real time but only publish daily or weekly transaction aggregates for exchanges and OTC markets to the broader public. Regulators would need real-time data to track evidence of market manipulation in the presence of sophisticated high-frequency trading algorithms, but lower-frequency disclosures would be sufficient for transparency and research purposes to the broader public. The names of individual parties would remain anonymous, but transactions would be tagged according to the new declassification scheme introduced by the CFTC. The aggregated data should nevertheless provide some disclosure of the average transaction prices and also its term structure, hence providing a finer decomposition than partial data would.

However, even as U.S. regulators proceed unilaterally, they should also strive to extend data reporting practices to foreign financial regulators. Not only would this minimize any capital flight into less-transparent markets abroad, but it would also help identify potential systemic risks from any financial positions held internationally. Particular attention should be paid to the next most liquid oil contracts after NYMEX's WTI, such as the Brent and Dubai futures contracts traded on the Intercontinental Exchange in London and the Oman futures contract traded on the Dubai Mercantile Exchange.

The IOSCO and the International Accounting Standards Board (IASB) already provide a platform for the sharing and coordination of financial data. The United States should push for the creation of a financial counterpart to the JODI agency that devotes itself to the detailed and timely dissemination of international financial positions in all commodity-related contracts.

CENTRALIZED CLEARING AND STANDARDIZED CONTRACTS

The 2008 financial crisis saw concerns over counterparty credit risk through opaque over-the-counter derivative exposures contribute to a cascading loss of confidence. The interconnected web of bilateral credit relationships between large financial institutions helped propagate this cascade into a catastrophic system-wide loss of liquidity.

A central counterparty clearing (CCP) mechanism holds much promise to stem financial contagion, by imposing, as the name implies, a central counterparty between the original transacting parties to guarantee execution of the transaction. Appropriately, the Dodd-Frank Act of 2010 emphasizes the mandatory trading of standardized OTC swaps through CCP clearing houses. Financial participants can make transactions confident that they are protected from idiosyncratic counterparty risk by the creditworthiness of the CCP. Furthermore, introducing transparency, record-keeping, and risk supervision is more logistically straightforward for a CCP clearing house than for the often dense and impenetrable records of multiple bilateral transactions.

However, a CCP clearing house requires economies of scale to be efficient, liquid, and cost-effective. Mandating high-volume contracts to be standardized and traded through designated CCP houses would provide such economies. Hence, standardization requirements for the large OTC derivative market form a natural regulatory complement to CCP implementation.

This applies to all financial markets. In commodity financial markets, the proliferation of "look-alike" contracts has made the regulatory impetus for standardization particularly acute. Look-alikes are swap contracts that essentially mimic the payoff structure of exchange-traded futures contracts, but are made bilaterally between private counterparties, which allows the holders to bypass exchange reporting requirements and position limits. For instance, as their large holdings in certain energy futures contracts drew criticism and regulatory scrutiny, ETFs such as USO and UNG diversified their holdings into look-alike swap contracts.

In the interest of securing greater transparency, uniform and robust risk management practices, eliminating regulatory loopholes, and reducing systemic contagion, CCP clearing of standardized OTC commodities contracts are thus, in many ways, a promising regulatory initiative.

However, regulators must also understand that CCP clearing carries risks as well. First, in effect, a CCP house consolidates the risks of multiple bilateral credit relationships into one giant centralized risk deposit, effectively aggregating multiple medium-sized risks into one extreme "too-big-to-fail" entity, namely the house itself. Theoretically, private insurance may be sufficient to manage house

systemic risk given its greater transparency and ease of quantification compared to the non-transparent bank balance sheet risks without mark-to-market procedures. But taxpayers may again be liable if a critical CCP house becomes vulnerable due to the failure of several of its constituent members and insurers because of other outside risks.

Furthermore, the network effects of such consolidation are still ill-understood. Preliminary studies suggest that aggregate credit risk would be reduced only when multiple different derivative classes, such as commodities, foreign exchange, and credit-default swaps, are jointly cleared in a single CCP rather than separately cleared through two or more CCPs.[10] This again suggests that international coordination between regulators will be helpful to ensure that sufficient economies of scale are achieved with a minimum number of CCP clearing houses.

However, this raises difficult questions as to whether the U.S. government, and ultimately taxpayers, would become liable if, for instance, a Europe-based CCP clearing house heavily used by U.S. financial institutions failed. Indeed, this is just one instance of a broader question confronting any systemically important part of the post-crisis global financial architecture: if it fails, which nation, if any, would be responsible for footing the bill of a rescue? Regulatory harmonization and cooperation between the various national regulators is indispensable to prevent a tragedy of the commons where each nation wishes to defer regulatory and financial burdens of managing systemic risk to others.

Policymakers have been making progress coordinating internationally on CCP clearing of standardized contracts apace with financial transparency initiatives.[11] In response, several CCP platforms, including the Chicago Mercantile Exchange's (CME) ClearPort clearing service for commodity contracts, have been launched in the private sector in the past few years.

Policymakers should thus proceed with standardization and CCP initiatives, but they should also devote particular attention to ensuring international harmonized regulation, sufficient economies of scale, and robust risk supervision.

Furthermore, they should pursue agreements that clearly define and limit the liabilities of specific national governments when a systemically critical CCP must be publicly rescued.

The G20 and the IOSCO have been the primary forums to promise international harmonization, but coordination with the International Monetary Fund, which publishes the Global Financial Stability Report, and the Bank of International Settlements, which oversees the Basel Committee on Banking Supervision, may be desirable when fleshing out the operational details of CCP harmonization.

If policymakers are unable to achieve satisfactorily harmonized regulation and national contingency commitments, the U.S. government may be forced to proceed unilaterally with regulation for CCP houses that are within its borders. If that becomes the case, the U.S. government may be forced to escalate standards to ensure systemic stability, such as mandating CCP members to contribute to a liquidation fund to pay for the dismantlement process in the event of a member or house failure. However, higher standards will come at the cost of less liquidity, and improved international harmonization remains the ideal.

The U.S. government may also be forced to require American financial institutions to use only those CCP houses, whether domestic or abroad, with sufficient regulatory standards to prevent exposure to financial contagion. However, there is significant risk to creating nationally segmented CCP houses, with American companies using only U.S. CCP houses and European companies using only European CCP houses. It would be much better to have a few harmonized CCP houses globally.

CAPITAL AND MARGIN REQUIREMENTS

While transparency and centralized clearing requirements promise clear gains in market efficiency and improved systemic risk control, the effects of capital and margin requirements on market efficiency are more ambiguous. Certainly, regulatory capital can be a powerful tool in curbing excessive risk-taking and preventing systemic crises, and both the U.S. Federal Reserve and other financial policymaking houses are raising capital and margin requirements to enhance macro-prudential supervision.

Furthermore, in the context of OTC markets, regulators appear determined to impose stricter capital and margin requirements on non-centrally cleared derivative transactions, given the greater potential counterparty risks of bilateral relationships over a CCP. This may additionally incentivize financial participants to use more exchange-traded and CCP-cleared standardized transactions, creating the desirable economies of scale discussed in the previous section.

However, setting capital requirements proportionate to the amount of risk a party assumes is more an art than a science. Regulators will have to balance appropriate capital and margin requirements to the risks at hand and not unnecessarily weaken the legitimate market for customized OTC products, such as a contract linked to a non-benchmark grade of crude oil to which a commercial operator is physically exposed.

In addition, it is important to note that stricter requirements may not necessarily reduce financial volatility but may even contribute to it after the fact. Again, regulators may draw lessons from the 1993 failure of Metallgesellshaft AG, a large energy wholesaler. Metallgesellshaft AG had offered long-term (five-to-ten-year) contracts promising delivery of heating oil and gasoline at fixed prices to retailers, and offset these obligations through the purchases of near-term futures contracts. This risk management strategy proved unviable when the term structure of energy prices moved into "contango," in which short-term prices drop below long-term prices. Putting aside the wisdom of such risk management practices in principle, the deterioration of their marked-to-market short-term futures positions triggered a cascade of margin calls that eventually led to collapse and a system-wide loss of confidence.

Given the extreme volatility and the significant possibility of large swings in commodity prices relative to the prices of other financial products, overly onerous margin requirements may result in a far higher frequency of the margin calls that trigger the sorts of systemic failures that the requirements try to prevent in the first place. In other words, tighter margin requirements may reduce some risk-taking in the first place, but every amount of risk taken ultimately increases the chance of a margin-call driven forced liquidation. This leaves the overall impact on systemic risk uncertain.

Regulators will need to use their experience and judgment to gauge appropriate capital/margin requirements that will disincentivize unsustainable risk management practices but nevertheless leave room for sufficient trading activity and controlled volatility.

Furthermore, capital/margin requirements pose greater risks than financial reporting and central clearing requirements for investor flight to less regulated havens abroad. The U.S. government would need to expend much effort to ensure international harmonization and a level playing field. If necessary, the IOSCO, in bringing together all major financial regulators, may provide another natural platform for agreeing on capital/margin harmonization.

However, given the ambiguity of their effects on market efficiency, policymakers should prioritize international transparency and central clearing initiatives above stricter margin/capital requirements.

POSITION LIMITS AND HEDGE EXEMPTIONS

If there is already legitimate concern about whether higher capital and margin requirements can ultimately improve market efficiency, position limits are even more ambiguous. Politicians have found something timelessly appealing in the idea that somehow manually capping the presence of speculators can prevent the next bubble and reduce market volatility. Not only does this ignore the gaping shortfalls in physical and financial transparency that may better address market volatility; it also ignores irreversible structural shifts in the commodity investment landscape. Binding position limits will likely be counterproductive in restraining excessive speculation and may be useful only for the narrower purpose of preventing market manipulation.

Concerns over excessive speculation are as old as the first bubble in financial markets, and debate may continue indefinitely over the optimal ways to perfect these all-too-human phenomena. As mentioned above, many experts have conducted a battery of tests to determine a causal relationship between oil price overshooting and speculative behavior, and have largely found none. While even the absence of proof does not imply a proof of absence, policymakers should certainly not assume that position limits and trading bans against speculators are the most effective way to improve market efficiency.

Regulators would be better advised to first address shortfalls in physical and financial transparency before turning to more radical interventions. Indeed, with sufficient transparency, regulators may find most of their desired goals to reduce market volatility fulfilled. Meanwhile, enforcing position limits will draw regulatory resources away from other responsibilities and add cumbersome regulatory regimes to the often ill-defined boundaries between exempt commercial hedging and speculative risk taking.

Another issue confronting position limits is whether to exempt the large index and ETF investment vehicles that have attracted the most criticism. On the one hand, long-only investment vehicles seem to represent all that is undesirable in a commodity market financial participant. They represent enormous influxes of long-only ill-informed investment capital into a still relatively illiquid commodities market. If any party would be guilty of causing a significant market footprint and distorting financial prices away from fundamental values, indices and ETFs would be suspect.

On the other hand, investment into indices and ETFs ultimately come from retail investors, who do not possess the sophistication and resources to trade commodities individually at high frequency but seek simple passive exposure to the broader asset class. And retail investors hold legitimate reasons to seek diversification into commodities in their pension and mutual funds to hedge against the negative macroeconomic repercussions and wealth effects from higher energy prices. Position limits on these passive investment vehicles would shut the door to the average retail investor while more sophisticated investors enjoy exemptions.

The extent to which indices and ETFs built up large market positions and thus were forced to turn to the OTC market for further exposure in the late 2000s suggests the still-enormous untapped interest by retail and institutional investors in commodities. Furthermore, in a dual-speed global recovery in which resource-hungry emerging economies are forecasted to grow much faster than the advanced economies recovering under the shadow of higher sovereign debt levels, there is every likelihood that there will be increased interest in commodity contracts, particularly those linked to China.[12] Most of this increased demand will occur outside of U.S. regulatory purview.

Imposing binding position limits on indices and other passive investors would not address the underlying motivations of their investment and only distort them into seeking roundabout ways to find their desired exposure. Standardizing look-alike contracts may close one loophole, but the private sector would almost surely find others, perhaps by slightly modifying OTC contracts to make them customized in name if not in spirit.

Position limits may also be difficult to enforce, since market participants will be able to create alternative offshore investor entities and vehicles in non-U.S. financial centers such as Dubai and Singapore. The logistic challenges of enforcing tight position limits overseas is not worth the effort and limited resources of domestic regulators.

Even if the international consensus was for stricter positions limits, the CFTC may be better served by declining position limits in favor of transparency. Yet the UK's Financial Services Authority (FSA), which has oversight over the trading of the ICE Brent Crude Oil futures contract—the next most liquid contract after NYMEX WTI—has already opined strongly against the merits of position limits.[13]

The CFTC has introduced a proposal to expand rule-based position limits currently imposed on agricultural commodities to four energy contracts traded on NYMEX. Such position limits should be used sparingly to prevent market manipulation such as short-squeezes and not as a blunt tool against excessive speculation. The CFTC proposal would grant exemptions for bona fide hedging needs, but it has left open the question of whether to classify index investors and ETFs as bona fide hedgers. At a minimum, the CFTC should develop a more robust framework, ideally in conjunction with financial market transparency initiatives, to better identify and classify the motivations behind specific trade positions.

Conclusion

The gyrations of energy prices in 2007–2008 cruelly exposed the world to high economic and social costs, galvanizing political discontent with perceived shortcomings in financial commodity markets, notably against excessive speculation.

The U.S. government has responded with a comprehensive regulatory overhaul of financial markets that require detailed interpretation and implementation as well as harmonization with regulatory initiatives abroad, of which some are highly interventionist.

But not all policy measures being contemplated are equally desirable. Transparency initiatives, at both the physical and market transaction levels, have been underappreciated as central and essential for identifying and reducing market inefficiency. Furthermore, efforts at international transparency may serve as a useful platform for further international cooperation on the trickier parts of commodity market regulation. At the same time, many of the objections made to U.S. tightening of regulations on the grounds that others may not follow are without strong foundation. In many cases, the United States should proceed unilaterally, even as it seeks cooperation.

Other initiatives, such as centralized clearing and higher capital and margin requirements, are not as clearly beneficial. At best, they will require careful implementation to be wise. Some, such as position limits, may be entirely counterproductive.

Commodity prices will unavoidably continue to fluctuate intensely given fundamentally low elasticities of demand and supply, making full price management impossible. But the recommended policies should reduce unnecessary market volatility and align market prices closer to fair valuations. The resulting improvement in market efficiency will aid the proper functioning of the U.S. energy complex, enhancing national economic and financial security.

About the Author

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Endnotes

1. The scale of the economic burden has led some to argue that the oil price shock was a critical contributor to the 2007 U.S. recession. For example, see James D. Hamilton, "Causes and Consequences of the Oil Shock of 2007–08," 2008 Brookings Institution conference paper.
2. Research arguing against the linkage between commodity financial prices and financial speculation is voluminous, including "Does Financial Investment Affect Commodity Price Behavior?" in *World Economic Outlook: Financial Stress, Downturns, and Recoveries,* (Washington, DC: International Monetary Fund, October 2008), *Interim Report on Crude Oil,* Interagency Task Force on Commodity Markets, July 2009, and "The Financialization of Commodity Markets," in *Trade and Development Report 2009,* United Nations Conference on Trade and Development Report (Geneva, Switzerland: United Nations, 2009).
3. For an empirical and theoretical overview of commodity price stabilization policies, see David Newbery and Joseph Stiglitz, *The Theory of Commodity Price Stabilization* (New York: Oxford University Press, 1981).
4. See, for example, John Cooper, "Price Elasticity of Demand for Crude Oil: Estimates for 23 Countries," *OPEC Review,* vol. 27, no. 1, March 2003. Cooper estimates short-term (within one year) price elasticity of U.S. oil demand run approximates -0.061. In other words, to incentivize U.S. consumers to reduce oil consumption by 10 percent within one year, oil prices must rise by over 164 percent.
5. In the interest of brevity, the discussion concentrates on oil, but other energy sources such as natural gas and coal are also projected to grow in importance in the global energy balance, and data availability is similarly poor outside the OECD.
6. The difference, of course, is not quite so stark. For example, equity prices in "growth" companies such as tech startups also feature difficult-to-quantify values and even those markets with fairly good micro-level data such as housing markets also saw price overshooting in mortgage-backed securities.
7. Daniel P. Ahn and Leonid Kogan, "Crude or Refined? Understanding Oil Dynamics through the Crack Spread," Working Paper, 2009, finds that the 2007–2008 oil price spike was driven more by expectations of future supply shortfalls ("peak oil") than immediate demand pressures. Robust and credible data on the size and recoverability of remaining reserves in the world could potentially have exerted invaluable calming effects on oil markets during the recent crisis.
8. The Squam Lake Working Group Paper series on financial regulation has in previous reports already recommended a TRACE-like program for the OTC credit default swap market.
9. See Hendrik Bessembinder and William Maxwell, "Transparency and the Corporate Bond Market," *Journal of Economic Perspectives,* vol. 22, no. 2, spring 2008, for an overview of recent research on transparency and TRACE's effects in the corporate bond market.
10. Darrell Duffie and Haoxiang Zhu, "Does a Central Clearing Counterparty Reduce Counterparty Risk?" Stanford University Graduate School of Business Research Paper No. 2022, July 2010, shows how, for plausible scenarios, creating a CCP for a single class of derivatives would reduce netting efficiency and increase average default exposure.
11. The G20 communiqué from the Pittsburgh 2009 summit specifically identified CCP of standardized OTC derivatives as a primary goal by the end of 2012.
12. See *World Economic Outlook: Recovery, Risk, and Rebalancing* (Washington, DC: International Monetary Fund, October 2010), which forecasts real output in emerging economies to grow 6.4 percent in 2011, compared to 2.2 percent growth in the advanced economies.
13. *Reforming OTC Derivative Markets: A UK Perspective*, FSA and HM Treasury Report, United Kingdom Cabinet Office, December 2009.