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April 29, 2015

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Mr. Christopher Kirkpatrick
Secretary
Commodity Futures Trading Commission
Three Lafayette Centre
1155 21st Street NW
Washington, DC 20581

Re. Position Limits for Derivatives
(CFTC RIN 3038-AD99)

Dear Mr. Kirkpatrick,

Please accepted the enclosed paper as a late comment to the position limits rulemaking.

Sincerely,

A handwritten signature in black ink, appearing to read "James Williams", with a long, sweeping horizontal stroke extending to the right.

James Williams
Associate Professor

Dodging Dodd-Frank: Excessive Speculation, Commodities Markets, and the Burden of Proof

JAMES W. WILLIAMS

Inspired by the wave of regulatory rulemaking, which followed the 2008 financial crisis and the passage of the Dodd-Frank Act, this article examines the efforts of the Commodities Futures Trading Commission to implement one such rule: Rule 76 FR 4752. Born of concerns with the impact of financial speculators on commodities prices, the rule calls for the expanded use of position limits to control “excessive speculation” in US commodities markets. In documenting the political and legal life of this rule from its roots in policy reports through to its suspension by a federal judge, the article explores the place of “evidence” in the rulemaking process. Particular attention is devoted to the growing evidentiary burden placed on financial regulators who are expected to frame market problems in terms of quantitative, price-based forms of harm. In the case of position limits, this has involved statistical analyses of the causal connections between excessive speculation and commodities prices and the use of a single statistical test: Granger causality. By examining the parameters and limitations of this test, the article offers a valuable window into the unique challenges of financial regulation and their roots in questions of knowledge, evidence, and proof.

INTRODUCTION

Passed in the wake of the financial crisis of 2008, the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) has been hailed as one of the most extensive interventions in US financial markets since the New Deal era reforms of the 1930s. Mandating 348 rulemakings across twenty different agencies, the legislative package has spurred a torrent of regulatory rulemaking on matters ranging from proprietary trading, to capital requirements, to greater market transparency. Despite this burst of legislative energy, the implementation of these rules has been halting to say the least. Many proposed rules have foundered in the face of fierce opposition and intense industry lobbying both behind the scenes and through the formal comment

I would like to thank the editor and the three anonymous reviewers for their helpful comments and valuable insights. They were instrumental in revising the article.

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process. None of this is especially surprising. Resistance, delay, and circumvention are age-old industry tactics. And yet, the barriers thrown in the way of Dodd-Frank are not simply a case of business as usual. In a series of groundbreaking cases, key rules promulgated by the Securities Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) have been challenged and subsequently vacated primarily on evidentiary grounds with district courts chiding the agencies for their failure to provide sufficiently robust cost-benefit analyses. Through these forms of judicial intervention, matters of evidence, the treatment of empirical research, and the ability to articulate, quantify, and monetize projected costs and benefits have emerged as central to the Dodd-Frank implementation effort.

This article takes aim at these shifting standards of regulatory rulemaking in the financial sphere and their roots in evidentiary formats and econometric techniques, which privilege quantitative and statistical forms of analysis. The specific context for this examination is one of the less widely acknowledged although no less controversial rules emanating from Dodd-Frank, Rule 76 FR 4752.¹ Motivated less by the subprime crisis and more by the crisis of escalating food and energy prices, this provision mandates the CFTC to use position limits² to restrict the flow of speculative capital into markets ranging from metals, to oil and gas, to agricultural commodities. The ensuing rulemaking process has been extremely contentious with the rule triggering thousands of comment letters as well as a lawsuit against the CFTC spearheaded by two Wall Street trade groups. At the center of these debates have been the evidentiary grounds of the rule itself. Drawing from correlational and experiential evidence, proponents have argued that “excessive speculation” is clearly implicated in harmful price swings and that position limits are a necessary remedy. Detractors have meanwhile pointed to academic research, which they claim is more scientifically robust and which has failed to detect a clear causal relationship between speculative positions and commodity price movements thus raising doubts about the merits of an expanded position limits regime. In documenting these competing views of “acceptable evidence,” and examining how the latter came to dominate as the issue migrated from the policy to the judicial sphere, this article offers a valuable window into the increasingly difficult work of financial regulation and the challenge of articulating market troubles in terms of specific price-based effects and quantitative signs of harm. An essential question is thus the type of evidentiary burden being imposed on regulators as a result of Dodd-Frank maneuverings and the ability of regulators, using available tools, data, and resources, to satisfy this burden.

The analysis proceeds through the following sections. The first section situates the position limits debate in the context of larger developments involving the role of evidence and expertise in the legal and regulatory sphere. This includes the growing reliance on scientific and statistical measures of harm as well as the greater willingness of the courts to step in as the arbiters of last resort determining whether regulators have satisfied their obligations

in individual cases. The next section delves into the position limits debate exploring the different forms of evidence brought to bear on the relationship between “excessive speculation” and commodities prices and examining how the standards of acceptable evidence shifted as the debate migrated through various social, political, and legal spheres. The third section takes aim at the academic research used to undergird claims that excessive speculation is not a significant driver of commodities prices, research that relies almost exclusively on a single econometric test. In examining the limitations of this test, known as Granger causality, and its ability to distill the causal connections between investor positions and price movements, the push toward quantification is placed in a more critical light with available econometric methods constrained both by internal parameters and sensitivities and by a limited view of “price” itself. Drawing from recent work in the Social Studies of Finance (SSF), an alternative view of price as a social, material, and technological accomplishment is presented, which further problematizes not only the search for conclusive evidence or “proof” of the causal connections between speculative investments and observed price movements, but also the ability of econometrics to provide clear and irrefutable articulations of price-based forms of financial harm. The conclusion draws out the implications of this analysis for regulatory rulemaking, including the benefits of conceiving of regulatory struggles in terms of epistemic challenges and competing constructions of proof as opposed to well-worn accounts of capture, complicity, and purely interest-based politics.

LAW, SCIENCE, AND FINANCIAL REGULATION

The debate over position limits and the links between speculation and commodities prices is set against the backdrop of a series of larger transformations in the relationships between law and science, and the shifting standards and evidentiary thresholds governing what qualifies or counts as acceptable evidence in legal and regulatory proceedings (Edmond 2004; Mercer 2002; Jasanoff 1995). Emerging from campaigns against “junk science” in the 1980s and early 1990s, a key moment in these transformations was a shift in the admissibility standards for expert evidence in US civil law, specifically the Daubert trilogy of cases (Daubert v Merrell Dow Pharmaceuticals 1993; General Electric Co. v Joiner 1997; Kumho Tire Co. v Carmichael 1999), which not only placed more power in the hands of judges to determine whether to admit expert testimony, but also codified a series of specific standards according to which this evidence is to be adjudged. This included an emphasis on methodological “gold standards,” such as the randomized controlled trial and the epidemiological study as well as evidence that can be scientifically verified and validated based on epistemic conventions of “sound science,” namely, falsifiability, peer review, and known error rates. Whether embedded in Daubert itself, or how judges have subsequently taken up the

decision, these new standards have been accompanied by the privileging of statistics and statistical measures of significance and causality as essential proxies for “sound method” and “quality research,” and at the same time a disparaging of more experiential and clinical forms of knowledge rooted in attributions of professional status and standing (Scales 2009; Mercer 2008; Edmond and Mercer 2004; Jasanoff 2002). Thus, while the ostensible purpose of these changes was to ensure the courts were making admissibility rulings based on sound scientific principles rather than deference to the informal and untested norms of professional communities, in practice this has resulted in an emphasis on whether research conforms to the outward signs of scientific objectivity (Scales 2009; Jasanoff 2002, 2012) and “epistemological correctness” (Mercer 2008, 419), making it more difficult to press claims that cannot be easily quantified or subject to linear causal modeling (Scales 2009; Mercer 2008; Edmond and Mercer 2004; Jasanoff 2002, 2012).

While having the greatest impact on the civil sphere, these shifting standards of scientific and statistical evidence have also made their way into the regulatory realm. Since the early 1980s, federal executive agencies in the United States have been required by executive order to undertake quantitative risk assessments and cost-benefit analyses as part of their justifications for proposed rules. Appeals to the available scientific record, including research conducted by the agencies themselves, have been central to this process and have informed the effort to quantify and monetize both the expected costs and intended benefits of proposed rules. Bolstered by the growth of risk-based regulation more generally as an essential means of rationalizing scarce resources and defending agency actions (Jasanoff 2011; Black and Baldwin 2010; Mercer 2008; Power 2007; Rothstein, Huber, and Gaskell 2006; Hutter 2005), these forms of quantitative risk analysis and evidence-based regulation have become battlegrounds over regulatory accountability and the fodder for various external challenges.

One such challenge has come from the courts. Empowered by legislation such as the Administrative Procedures Act (1946), federal courts have repeatedly proven their willingness to step in and suspend agency rules in cases where regulatory justifications are deemed lacking, with these determinations resting on many of the same epistemic conventions and standards of scientific proof operative in the civil realm. In addition to the more inadvertent seepage of increasingly stringent standards of evidence into the regulatory sphere, perceptions of a lack of accountability and the continued practice of “bad science” (Wagner 2003) have also triggered calls for Daubert principles to be formally extended to the judicial oversight of regulatory agencies, what has been described as the “Daubertizing” of judicial review of regulatory risk assessment (McGarity 2003). The result of this greater oversight by the same generalist judges trained to think more like scientists in the civil realm (Jasanoff 2002) has been the continued move away from the precautionary principle as a guiding regulatory logic and a reticence to proceed with new rules in the absence of clear, irrefutable, and quantifiable evidence of harm.

These dynamics are by now fairly well documented as they relate to social and environmental regulation (Abraham and Davis 2013; Kysar 2010; Edmond 2004; Jasanoff 1990, 2011). However, there has been very little discussion of their impact on financial rulemaking. This is likely due to the greater autonomy historically enjoyed by financial regulators. As independent agencies, they have been exempt from the executive orders mandating risk assessments and cost-benefit analyses for social and environmental agencies. While the SEC has gradually assumed the mantle of cost-benefit analysis as part of its rulemaking process, this has been undertaken largely on a voluntary basis and absent any formal statutory requirement. It was not until 1996 that the obligation to conduct a cost-benefit analysis, taking into account whether proposed rules would “promote efficiency, competition, and capital formation” (National Securities Market Improvement Act of 1996, 3424) was added to the SEC’s founding statute with a similar obligation extended to the CFTC through the Commodity Futures Modernization Act (2000) soon thereafter. And yet, once again, this appeared to have little impact in practice as the agencies continued to engage in rulemaking with limited concern for the quality or rigor of their “economic analyses,” a casual approach bolstered by the greater deference afforded financial regulators by the courts (Guynn 2013; Cox and Baucom 2012).

The initial signs of a more skeptical view of financial rulemaking began to emerge in 2005 with the first of a series of decisions in which the courts directly challenged and subsequently remanded SEC rules on the grounds that the agency had failed to adequately account for the costs and benefits of proposed rules. Most notably, in the first of these cases (*Chamber of Commerce v SEC* 2005), the court stipulated that the economic analysis of agency rules could not rely on regulatory experience and opinion alone, but rather necessitated quantitative estimates of costs and benefits, even if these were admittedly imperfect and conceivably ill-suited to quantifying larger economic benefits (Notini 2013). However, it was not until the passage of Dodd-Frank in 2010 that the courts began to adopt this more skeptical approach in earnest, and regulators were forced to sit up and take notice. The clearest indication that things had changed came from a legal challenge to one of the first SEC rules to emerge from Dodd-Frank, the so-called proxy access rule (see *Business Roundtable v SEC* 2011), which was designed to enhance the ability of shareholders to nominate their own candidates for election to corporate boards of directors. In his decision to vacate the rule, the judge not only drew from the authority of earlier decisions citing severe inadequacies in the agency’s cost-benefit analysis, but imposed an even more exacting standard of review. Departing from the usual determination of whether the economic analysis and the treatment of the available evidence (including submitted studies and comment letters) was *reasonable*, the judge engaged in his own Daubert-like assessment of the evidentiary record, deeming the SEC to have relied on weak evidence while overlooking more compelling studies that challenged the benefits of the rule. Emboldened by

this early success, a rash of industry-sponsored lawsuits soon followed with the SEC having six of its rules thrown out over a seven-year span (Edwards 2013; Proress 2012). The SEC has since responded by embracing these demands for more rigorous and quantitative economic analysis. The agency has bolstered its complement of financial economists in its Division of Economic and Risk Analysis and stipulated that economists play a more prominent role in the rulemaking process, going so far as to give them veto power over proposed regulations (Kraus and Raso 2013; Manne 2012). This was codified in an SEC memo released in March, 2012 entitled “Current Guidance on Economic Analysis in SEC Rulemakings.” Citing recent court decisions, the memo declares that “high quality economic analysis is an essential part of SEC rulemaking” (1) and makes several recommendations to strengthen these analyses including (1) the earlier and more substantial involvement of SEC economists in the rulemaking process, (2) the quantification and monetization of expected costs and benefits, and (3) greater use of outside studies and/or empirical evidence (SEC 2012). On the legislative end, there have also been a series of proposals designed to codify these obligations, the most noteworthy of which is the Financial Regulatory Responsibility Act, which proposes to restrict the rulemaking authority of the SEC, CFTC, and eight other financial regulators to cases in which a “rigorous and consistent” economic analysis had demonstrated that the *quantified* benefits of the regulation exceed its *quantified* costs (Kraus and Raso 2013).³

Taken together, these developments clearly signal the emergence of a heightened evidentiary threshold for financial rulemaking akin to that unfolding in other regulatory contexts, one that is rooted not only in the privileging of quantitative forms of evidence and quantifiable costs and benefits, but also a very specific type of econometric expertise (hence the SEC’s investment in economists rather than lawyers). The courts have emerged as key arbiters of these standards and are clearly more willing to intervene in cases where regulators have allegedly fallen short, a marked departure from the largely deferential attitude of the past. And yet, it is unclear exactly what all of this means for financial regulators who face a number of distinct challenges in documenting market troubles and thus capturing the benefits of proposed rules using the preferred econometric techniques. Unlike social and environmental regulators who are at the very least able to ground their inquiries in the materialities of poisoned fish, ill workers, or contaminated lakes, financial regulators are bound to more abstract notions such as “market integrity” and “investor confidence.” They are likewise challenged by the virtual and distinctly disembodied nature of financial markets (MacKenzie 2007; Knorr Cetina and Preda 2005), by the opacity of trades transacted “off-market” and flowing through “dark pools” of capital, and by the difficulty of defining troublesome market activities using price as the only real measure of harm. Uncertainties also linger over what “regulatory science” looks like in this context—that is, what tools, measures, and methods are available to financial regulators; their relative

merits and limitations; and what standards should be applied in evaluating the evidentiary record. Moving beyond the SEC, the debates surrounding the CFTC's position limits rule offer an ideal opportunity to broach these very questions as they are essentially debates about evidence, specifically about what qualifies as acceptable evidence of financial speculation's impact on commodities prices. The fact that these debates have played out across several different social and institutional sites, undergoing various transformations along the way, and culminating in yet another decision to vacate a Dodd-Frank rule, yields an especially valuable viewpoint on the shifting evidentiary landscape and how the urge to quantify has impacted regulatory action. Informed by legislative hearings, policy reports, comment letters, academic studies, and legal decisions, the focus turns to charting these very transformations.

WHAT'S THE PROBLEM?: "EXCESSIVE SPECULATION" AND COMMODITIES PRICES

The year 2008 will best be remembered as the beginning of the end for the subprime mortgage market and the start of the global financial crisis. However, 2008 was also marked by a second, less widely recognized, but no less significant crisis. This involved unprecedented increases in the prices of basic agricultural commodities such as corn, wheat, and rice (Murphy, Burch, and Clapp 2012). With prices reaching historic highs by the midpoint of 2008, only to fall sharply over the next six months and then rise again to a second peak in early 2011 (Nissanke 2012), concerns quickly mounted over the causes of these fluctuations and their implications for "food security" in various parts of the world. The result has been a sustained period of reflection, assessment, and debate, which has since unfolded within the spaces of policy reports, legislative hearing rooms, regulatory offices, and federal courtrooms.

POLICY

The first responses to escalating food prices took the form of policy reports, which emerged in the immediate aftermath of the initial price spikes and subsequent declines of 2008. Many early reports, authored by organizations such as the World Bank, the International Monetary Fund (IMF), the UN's Food and Agriculture Organization (FAO), and the Organization for Economic Cooperation and Development (OECD), attributed observed price movements to changes in "market fundamentals" including growing worldwide demand for food coupled with supply-side factors such as adverse weather conditions, low grain reserves, and the diversion of land for biofuel. However, this account was soon accompanied by a growing chorus of skeptics who argued that price fluctuations vastly exceeded what could reasonably

be explained by market fundamentals with the focus trained instead on the role of financial speculators, if not causing, then at the very least exacerbating the food crisis (de Shutter 2010; Ghosh 2010; Suppan 2010). One of the primary culprits in this purported inflow of speculative capital into commodities markets, which began in the late 1990s and escalated dramatically through the mid-2000s, were commodity index funds. First developed in the mid-1990s by investment banks, such as Goldman Sachs, these funds are derivative instruments that track the prices of a basket of commodities ranging from oil and gas, to metals, to agricultural products (Williams 2014; Clapp 2012). These investments are seen to offer large institutional investors, including pension funds, hedge funds, sovereign wealth funds, and university endowments, exposure to an asset class whose value is projected to grow well into the future and that boasts the additional benefits of both a hedge against inflation and a shelter from declines in other capital markets (Clapp and Helleiner 2012; Basu and Gavin 2011; Clapp 2009). Given these attractive properties, commodities came to be viewed as a safe haven, a source of “protection against financial instability” (Clapp and Helleiner 2012, 188) that was especially valuable in the years surrounding the subprime crisis as capital fled to the relative safety of commodity index funds and other commodity-based investments (Nissanke 2012).

In documenting the growth of commodity index funds from a market of less than \$13 billion in 2003 to more than \$260 billion in 2008 (Nissanke 2012), many policy reports reasoned that it was this influx of largely speculative capital that was responsible for driving commodities prices beyond their historic highs (Oxfam 2011; Schumann 2011; de Shutter 2010; UNCTAD 2009). This theory hinged on the particular relationship between index funds and commodities markets. While a commodity index fund is a “computational device unsupported by any actual assets such as futures or commodity holdings” (US Senate 2009, 6), and thus has no direct bearing on futures markets, in order to hedge their exposure to these investments the sponsoring funds purchase offsetting futures contracts for all commodities in the index. The result was an influx of speculative capital into US commodity exchanges.

In principle, speculation in these markets is nothing new. Speculators have long had a presence in futures markets providing offsetting positions for producers seeking to hedge their price risks in the physical market (Spratt 2013). However, while traditional speculators are responsive to actual or projected changes in supply and demand, index traders are largely indifferent to these market forces, responding instead to the external demand for their funds from outside investors and the need to maintain offsetting futures positions commensurate with fund allocations across different commodity groups. With these funds pitched as part of a “buy and hold” strategy geared toward the realization of long-term price gains, index traders always take the same long position continually rolling over their trades. According to critics, it was this distinct logic of speculative trading that contributed to higher and more volatile commodities prices (Greenberger 2013; Schumann 2011; de Shutter 2010).

Various forms of evidence have been marshaled in support of this budding narrative. The most significant involved comparisons of price data for key agricultural commodities with several different indicators of commodity index fund activity including (1) total assets under management, (2) transaction volumes, and (3) “open interest,” which refers to the number of contracts that have yet to be filled through delivery and thus serves as an indicator of the size of the positions held by different groups of traders in the futures markets. Collectively, these data appeared to provide strong support for speculators’ impact on commodities prices as increases in assets under management, transaction volumes, and open interest were all strongly correlated with price movements. These correlations were especially compelling when rendered in the form of visual evidence, including graphs and charts that superimposed index trader positions on trends in commodities prices and in almost every instance revealed a close correspondence with the two measures seemingly tracking in unison. Together with the belief that observed price movements in the 2000s vastly exceeded what could reasonably be expected given shifts in supply and demand, this strong correlational and visual evidence inspired a kind of commonsensical account of the food crisis in which financial speculation played an almost undeniable role.

LEGISLATIVE

The focus on financial speculation as a key contributor to escalating food prices was carried through into the political sphere where it gained further traction thanks to a series of congressional investigations, most notably an investigation into the US wheat market convened in June of 2008 by the US Permanent Subcommittee on Investigations. Drawing from pricing and trading data supplied by the CFTC as well as interviews with “numerous experts and persons familiar with the wheat markets, agricultural commodity markets as a whole, and commodity indexes” (US Senate 2009, 4), the investigation centered on the presence of index investors in the wheat futures market. A key protagonist in these hearings was Michael Masters, a hedge fund manager and founder of the advocacy group Better Markets. Masters originally came to the committee’s attention through a series of reports he had authored comparing commodity price increases to a speculative bubble and analogizing to the case of the Hunt Brothers who had cornered the silver market in the early 1980s (Masters and White 2008). Drawing from much of the same data and correlational evidence circulating in the policy arena, Masters likened the growing presence of index traders in US wheat markets to a form of “virtual hoarding” that had in turn generated “demand shock” driving up both futures and cash prices (Masters 2008), what has since come to be known as the Masters hypothesis. The final report largely endorsed this view of index speculation as a key culprit in increasingly volatile wheat markets (US Senate 2009).

The narrative of financial speculation also underwent two key changes in the legislative realm. First, rather than simply higher grain prices, index traders were seen as contributing to the larger problem of a disconnect between futures prices and the price of wheat in the cash market. This failure of futures and cash prices to behave as expected, with futures prices providing a meaningful indicator of the future direction of cash prices, was a serious concern for producers making it more difficult to accurately price their crops and hedge associated price risks. From a producer perspective, financial speculation was thus seen as undermining the very intelligibility of grain markets. Here again interviews and formal testimony played a central role: “Virtually all of the traders and analysts contacted by the Subcommittee stated that the large presence of commodity index traders . . . was the primary factor contributing to the pricing problems in the wheat market” (US Senate 2009, 138). Second, the activities of index traders and their impact on grain prices were formally constituted as a form of “excessive speculation,”

There is significant and persuasive evidence to conclude that these commodity index traders, in the aggregate, were one of the major causes of “unwarranted changes”—here increases—in the price of wheat futures contracts relative to the price of wheat in the cash market . . . Accordingly, the Report finds that the activities of commodity index traders, in the aggregate, constituted “excessive speculation” in the wheat market under the Commodity Exchange Act. (US Senate 2009, 2)

This finding was significant as it not only legitimized the narrative of financial speculation advanced in the policy realm, but, by invoking the concept of “excessive speculation,” allowed for the translation of what was largely a policy concern into the legislative framework of the Commodity Exchange Act (1936), thus bringing this issue into the purview of the CFTC and its founding mandate to control “excessive speculation.” Bolstered by earlier congressional investigations into speculation in the energy markets, and the implication of speculators more generally in the subprime crisis, this directive to curb “excessive speculation” eventually found its way into title VII, section 737 of Dodd-Frank, which mandated that, “the [CFTC] shall by rule, regulation, or order establish limits on the amount of positions, as appropriate . . . that may be held by any one person.” With this provision, the CFTC was thus formally obliged to take action.

REGULATORY

Following a period of internal and external consultation, the CFTC issued its first Notice of Proposed Rulemaking (NPRM) on January 26, 2011.⁴ As expected, the NPRM included several controversial proposals. For the first time, energy and metals (including gold, silver, crude oil, natural gas, and heating oil) would be added to the list of commodities to which position

limits would apply. The position limits regime was to be expanded to include economically equivalent swaps, thus closing the “swap dealer loophole.”⁵ Finally, specific limits would be established for index traders while tightening the exemptions for “bona fide” hedging transactions. As per standard protocol, the CFTC opened a period of public comment seeking feedback on the proposed rules. Not surprisingly given the stakes, the agency was inundated by nearly 15,000 comment letters.⁶ Many of these were form letters condemning speculators and voicing blanket support for the proposed rules as a brake against higher and more volatile prices but providing few details. The most sophisticated letters came from the industry players most affected by the proposed rules including futures exchanges concerned with the potential loss of business (e.g., CME Group) and sponsors of commodity index funds who risked being frozen out of the market (e.g., BlackRock). These letters were universally critical, citing a long list of concerns ranging from the definition of “bona fide” hedging being too narrow and overly restrictive, to the aggregation provisions being too broad, to the CFTC’s failure to engage in an adequate cost-benefit analysis, with little thought given to the potential costs of the rule including reduced market liquidity, greater price volatility, and higher hedging costs.

Beyond these individual grievances, a central claim made in nearly every industry letter was that the CFTC had failed to provide any evidence that excessive speculation was actually a problem or, more to the point, that index traders were responsible for documented price changes. The crux of this argument hinged on the question of causality. While acknowledging the seemingly strong correspondence between commodity index funds and changes in commodities prices, many letters asserted that this link was merely correlational with no evidence of a truly causal connection. Here they invoked academic studies, which, in their view, had not only failed to substantiate this causal link, but identified market fundamentals as the most likely culprit in fluctuating commodities prices. According to BlackRock,

The Commission does not support its proposal by citing any modern economic study *proving* that large speculative positions *cause* artificial prices or price volatility. To the contrary, economists, academics, international agencies, and US governmental agencies, including the Commission itself, have not identified a *causal link* between speculation—whether by index funds specifically or speculators generally—and price volatility in commodities. (Medero 2011, 3)

A similar point is made by the Coalition of Physical Energy Companies, which chides the CFTC for offering “no empirical basis to conclude excessive speculation has burdened or harmed modern markets in any way” (Perlman 2011, 3). For the CME Group, the causes of these price changes are no longer a matter of dispute: “there is virtually unanimous academic agreement that commodity price changes have been driven by fundamental market conditions, not by speculation” (Donohue 2011, 4).

These concerns with the state of the available evidence clearly resonated with CFTC commissioners. Despite finally approving a substantially revised

position limits rule at its October 18, 2011 meeting in a close 3-2 vote, several commissioners expressed reservations about the lack of supporting evidence and the possibility that the rule may do more harm than good. In the words of Commissioner Michael Dunn,

No one has presented to this agency any reliable economic analysis to support either the contention that excessive speculation is affecting the markets we regulate or that position limits will prevent excessive speculation . . . my fear is that position limits are, at best, a cure for a disease that does not exist or a placebo for one that does.⁷

Despite this reservation, Dunn voted in favor of the rule arguing that Congress had mandated position limits leaving the CFTC with no choice in the matter. Commissioner O'Malia, in his dissenting statement, intimated that future legal challenges would be likely as the agency was "passing [its] responsibilities on to the judicial system to pick apart this rule in a multitude of legal challenges."⁸

JUDICIAL

O'Malia's prediction proved prescient. Drawing on much of the same evidence presented in the comment letters, in late 2011 two industry lobby groups representing international swap dealers and US securities firms, the International Swaps and Derivatives Association (ISDA) and the Securities Industry and Financial Markets Association (SIFMA), filed suit against the CFTC in the US District Court for the District of Columbia. The lawsuit alleged that the CFTC had violated the Commodity Exchange Act by failing to provide a proper cost-benefit analysis of the rule, a charge identical to that levied against the SEC in similar cases, and that it had engaged in "unreasoned decision making" as defined by the Administrative Procedures Act. This latter claim hinged on the lack of evidence marshaled in support of the rule and the neglect of contrary evidence as proffered by the comment letters. According to the complaint, "[The commission] acted arbitrarily, capriciously, and contrary to law by failing to support the specific limits set and related provisions with sufficient evidence, ignoring contrary evidence in the record, and insufficiently apprising members of the public of the basis for the proposed rule" (International Swaps and Derivatives Association and Securities Industries and Financial Markets Association v United States Commodities Future Trading Commission 2011, 3–4). Academic research and the "substantial academic consensus that position limits are unnecessary" (ISDA 2011, 2) played a central role in the suit. So too did the public misgivings of CFTC commissioners with the plaintiffs asserting that Commissioner O'Malia, in particular, had "essentially laid out the case for a judicial challenge to the Rule" (ISDA 2011, 1). The complaint also challenged the CFTC's position that the state of the available evidence was

mooted by the clear congressional directive to proceed with new position limits. Here the plaintiffs took direct aim at the wording of Dodd-Frank itself, interpreting the reference to “as appropriate” in the accompanying text not as an acknowledgment of the CFTC’s discretion to determine to which markets position limits should apply and at what levels, but rather a requirement that the agency first *prove* that position limits are necessary *before* proceeding with any new rules. Under this interpretation, the evidence question thus became much more central.

On September 28, 2012, a federal judge issued his ruling vacating the position limits rule and remanding it to the CFTC for further proceedings (*ISDA v CFTC* 2012). Rather than siding with either side’s interpretation of Dodd-Frank, the judge argued that the statutory language of “as appropriate” was itself ambiguous. For guidance, he then turned to the statutory language of the Commodity Futures Act, which obliges the CFTC to impose position limits “as the commission finds are necessary to diminish, eliminate or prevent” unreasonable price swings caused by “excessive speculation” (Commodity Exchange Act 1936, sec. 4a[a]). Referring to previous occasions where the CFTC had rationalized new position limits on the basis of “necessity findings,” the judge interpreted the statute as being straightforward in terms of its obligations in the matter at hand: “The precise question . . . is whether the language of Section 6a(a)(1) clearly and unambiguously requires the commission to make a finding of necessity prior to imposing position limits. The answer is yes” (*ISDA v CFTC* 2012, 264). Through this interpretive maneuver the judge effectively skirted Dodd-Frank, invalidating the rule on the grounds that the CFTC had failed to live up to its statutory obligation to render findings of necessity prior to issuing new position limit rules.

The decision was widely reported as yet another blow to Dodd-Frank and a serious challenge to one of the CFTC’s most important post-crisis rulemakings. The CFTC has since engaged in various efforts to rekindle the position limits rule and get things back on track. Rather than capitulating to the holdings of the court as the SEC had done in earlier cases, the agency launched an appeal citing several flaws with the judge’s reasoning, including the neglect of the more recent context of regulatory rulemaking where position limits had been issued on precautionary grounds and in the absence of necessity findings (CFTC 2013). However, this appeal was subsequently dropped with commissioners instead voting on November 5, 2013 to pass a moderately revised position limits proposal. The rationale for the proposed rule included a more thorough cost-benefit analysis as well as a “necessity finding” rooted in two cases of market manipulation, one from the early 1980s involving the Hunt Brothers and their attempt to corner the silver market, and the other relating to the alleged manipulation of the natural gas market by Amaranth Advisors LLC in the mid-2000s. Not surprisingly, the reception to the revised rule has been equally hostile, with the new round of comment letters released in February, 2014 reiterating previous concerns regarding the unproven connection between speculation and commodities

prices, and thus the failure of the CFTC to satisfy its evidentiary burden, while also excoriating the agency on the grounds that its necessity findings were entirely inappropriate to the context at hand. As noted in the joint comment letter from the ISDA and SIFMA, “The CFTC’s case studies of these two instances of market disruption do not provide a basis for conclusions that are useful or relevant to addressing the current market and current market participants” (Young 2014, 12). At the time of writing, the fate of the position limits rule remains unresolved. Following concerns raised by commercial commodities trading firms (e.g., BP and Cargill) during the comment process for the revised position limits proposal (2013),⁹ concerns involving the proposal’s further narrowing of exemptions for bona fide hedging transactions, the CFTC reopened the comment period on June 12, 2014, with a deadline originally set for July 3 but later extended to August 4. The agency also held a special public roundtable on June 19, 2014, to address many of these same concerns. With speculation that a final rule may not be issued until the second half of 2015, the rulemaking process continues to be bogged down in a regulatory stasis, which has plagued much of the Dodd-Frank regime.

“EVIDENCE” OF HARM AND THE BURDEN OF “PROOF”

The social, political, and legal life of the position limits debate reveals a series of confrontations between very different visions and versions of acceptable evidence. Within the policy realm, the correlational and visual evidence supplied through basic descriptive statistics and rendered through graphs and plots was seen to offer a compelling case that financial speculation was indeed implicated in commodity price movements, especially when combined with commonsensical notions regarding the inevitable effects of large infusions of speculative capital. In the subsequent translation into the legislative sphere, this account was bolstered by interviews and personal testimonials as the issue was itself transformed into a legislative concern with excessive speculation herein reconfigured as a legitimate object of legislative action. The most significant shift occurred as the issue crossed into the regulatory sphere where, subject to the comment process and a different set of interests and logics, acceptable evidence was substantially reframed to include the work of faceless academics and a standard rooted in quantitative and statistical analysis and empiricist notions of causality. Prior research is herein reduced to mere correlation, a purely circumstantial case, with the experience of the CFTC juxtaposed with the quantitative analysis more redolent of serious policymaking. As noted in the plaintiff’s fact sheet, the CFTC “presented virtually no *quantitative* analysis or *empirical* evidence to support its conclusions. Its rationale for the Rule repeatedly invoked—without explanation—the Commission’s ‘beliefs’ based on unidentified ‘experience’ ” (ISDA 2011, 2).

Set amongst these divergent interpretations and competing evidentiary claims, the judicial decision is especially intriguing. On the direct question of the state of the available evidence, the judge had very little to say, declining to assess the merits of the claim that the CFTC had violated the Administrative Procedures Act by failing to provide adequate empirical support for the rule. By instead focusing on the ambiguity of the underlying statute, the decision thus departs from other cases where the courts have directly targeted agency cost-benefit analyses and their parsing of the evidentiary record. And yet, the judge does make reference to public comments made by CFTC commissioners regarding the absence of “reliable economic analysis” and the agency’s attempt to promulgate the rule “without any evidence that the positions limits would actually benefit the market” (Nevins 2014, 7). As a generalist member of the DC Circuit, the judge would also be well schooled in the post-Daubert evidentiary regime and thus receptive to alleged deficiencies in the empirical record. Regardless, what is most revealing about the decision is its reliance on the necessity finding, or rather the absence thereof, as the grounds for vacating the rule. By herein obliging the CFTC to render necessity findings as a matter of course for the rulemaking process, the judge effectively circumscribes the agency’s discretion to issue new rules while at the same binding the regulator to the discharge of an empirical and evidentiary obligation.¹⁰

Crucially however, little guidance is provided as to what this obligation actually looks like in the current context. The past necessity findings to which the judge refers, many from the 1940s and 1950s, essentially involved declarative statements that position limits were necessary to prevent excessive speculation from causing undue harm to the markets. These were rooted in public hearings and were rationalized largely through the agency’s own experience pursuant to a clearly prophylactic logic. Previous necessity findings were also geared toward a specific form of excessive speculation where the issue was the ability of individual traders to amass large positions and thus corner the market. This intentional act of market manipulation is very different from excessive speculation in the present context where the concern is instead with the aggregate effects of a general class of traders. The fact that the necessity findings accompanying the CFTC’s revised proposal revert to this traditional view of excessive speculation, the referenced cases involving the amassing of large individual positions with clearly manipulative intent, is itself telling, a potential sign of the challenges of producing the requisite findings in the contemporary market context where the indicators of harm are much less clear. There is also the question of the number of necessity findings that are required. Each of the previous findings invoked by the judge, the last one being from the onion futures market in 1956, were issued on a commodity-by-commodity basis, which, if applied to the current regime, would require the CFTC to convene hearings and pass twenty-eight separate necessity findings to cover the twenty-eight different commodities to which the rules would apply. This is precisely the expectation of SIFMA’s Asset

Management Group as articulated in its 2014 comment letter, “the AMG believes that before imposing speculative position limits, the Commission must and should make fact-intensive findings of necessity and appropriateness in support of its position limits regime based on an *individual contract-by-contract basis*” (International Swaps and Derivatives Association, et al. v United States Commodity Futures Trading Commission, 264; emphasis added).

It is likewise unclear how, or to what extent, the necessity findings should incorporate or speak to the academic research invoked by the comment process. Regulators, the SEC in particular, have been chastised in other Dodd-Frank lawsuits for their failure to engage with public comments and appropriately reflect on published academic studies (see *Business Roundtable v SEC* 2011). The position limits judgment is also vague on how the experiential and anecdotal evidence of the past is to be reconciled with the forms of quantitative and statistical analysis increasingly demanded in the present, with much of the amassed research clearly tending toward the latter. Thus, while the decision avoids any direct reference to the specific evidentiary obligation faced by the CFTC, the invocation of necessity findings clearly has the effect of imposing an empirical requirement that, when viewed in the larger context of Dodd-Frank lawsuits and the judicial review of regulation more generally, represents a heightened although exceedingly uncertain burden of proof.

All of this begs a fundamental question. If there are indeed indications of a move toward more demanding cost-benefit analyses and necessity findings, and if these are to be based on, and rationalized through, quantitative and statistical evidence using available econometric techniques, what does this evidence actually look like, how is it produced and by whom, and what is it ultimately able to deliver? When applied to the excessive speculation debate, the question is thus to what degree are available quantitative and statistical methodologies actually able to capture or gauge the impact of financial speculation on commodities prices, and is this a reasonable standard on which to base (and judge) regulatory rulemaking? With both the position limits rule, as well as future rulemakings, potentially bound to the claims furnished by academic research, there is a pressing need to open up the “black box” and examine more carefully the nature and quality of the evidence contained therein. The remainder of the article offers just such a foray, albeit a tentative one, into the world of econometrics providing a closer view of the available research on excessive speculation and its parameters, assumptions, and sensitivities.

ECONOMETRICS AS EVIDENCE

Drilling down into the comment letters, studies, and reports that inform the excessive speculation debate, one quickly discovers a heavy reliance not only

on econometrics, but also on a single econometric test known as Granger causality (GC). Developed by Nobel Prize-winning economist Clive Granger, GC is designed to overcome a key bugaboo of economic research: the inability to test for causal relationships among variables that are naturally occurring and thus not subject to the standard conventions of experimental research, namely, random assignment and variable manipulation (Morgan 1990). The technique pioneered by Granger involves taking data in two time series, offsetting them, and then testing whether data in the first time series is useful in predicting data in the other. When applied to research on excessive speculation, the test examines if the positions of index traders at one point in time can accurately predict the price of commodities in another. Were this the case, index speculation would then be said to “Granger cause” price. Notwithstanding some inconsistent findings and the view that the evidence as a whole is by no means clear cut (Girardi 2012), most academic studies employing this test have failed to detect a clear causal connection, hence the oft-reported finding that there is little empirical evidence to support the contention that index speculation *causes* price changes (Gilbert and Pfuderer 2014; Grosche 2014). A prominent OECD study authored by two well-known agricultural economists, Scott Irwin and Dwight Sanders, is typical in concluding that, “index funds did not *cause* a bubble in commodity futures prices. There is no *statistically significant* relationship indicating that changes in index swap fund positions have increased market volatility” (Irwin and Sanders 2010, 1; emphasis added).

Despite being “the most widely employed method used in the academic literature to examine the impact of asset market trades on price” (Gilbert and Pfuderer 2014, 134), as a statistical test GC is not without its critics. This is true not only of its specific application to commodities markets (Gilbert and Pfuderer 2014; Grosche 2014; Girardi 2012; Frenk 2010), but also its use within economics more generally where concerns have been raised regarding the test’s underlying assumptions, its ability to identify and isolate causal relationships using available data, and its limited view of causality as a purely statistical association (Pearl 2009; Reiss 2009; Hoover 2001). For many economists, the very reliance on statistical tests to address essential research and policy questions is itself a cause for concern, an indication of the discipline’s colonization by formal mathematical models and the dictates of statistical rigor to the neglect of other means and modes of inquiry (Swann 2006; Lawson 2003; Leamer 1983). This is seen as a fundamental constraint on applied research and its ability to provide valid and meaningful insights into the actual workings of economies and markets. While a full accounting of these issues exceeds the scope of this article, there are two respects in which Granger-inspired studies of excessive speculation embody very similar limitations with significant implications for their value *as evidence* of speculation’s impact on commodities prices. The first concerns the assumptions, parameters, and sensitivities of GC as a type of statistical test and form of mathematical modeling, while the second follows from a more general

tension between the formal properties of econometric models and the complex realities of markets and prices.

ASSUMPTIONS, PARAMETERS, AND SENSITIVITIES

Contrary to the prevailing image of statistics as a purely descriptive, mathematical operation in which data are inputted and results automatically spit out, statistical tests are best thought of as a form of modeling (Morgan 2012; Boumans 2005). They are tools by which to inquire into the economic world, and they involve an effort to reduce or distill complex economic relationships into statistical associations among a finite set of variables. The very process of model construction requires the researcher to make a series of decisions around which variables are to be included (or excluded), what types of relationships are expected amongst these variables and thus which hypotheses are to be tested, and how best to operationalize variables of interest and compensate for the limitations and unique properties of the available data. Not unlike macroeconomic modeling (Evans 1997) or even climate modeling (Edwards 2010), these decisions are informed by the researcher's judgment as well as by accepted conventions or conveniences within his or her particular epistemic community. They are also shaped by a series of implicit assumptions and parameters, some of which apply to statistical testing in general while others are unique to each individual test. For example, in order for the results of most statistical tests to be valid, the researcher must include all "relevant" variables with "missing variables" representing the most significant (and likely) limitation of any given study. There may also be constraints on the number of variables that can be examined, or the researcher may be limited, as is the case for most regression analyses, to testing for linear relationships. Collectively, these decisions, assumptions, and parameters constitute what are commonly referred to as the "sensitivities" of statistical tests—that is, the contingencies, uncertainties, or vulnerabilities that directly shape the results that are produced and how these results can, or should, be interpreted. Understanding these sensitivities is essential to unpacking exactly what these statistical tests do and ultimately what they are able to deliver.

While several sensitivities have been noted in relation to GC and its application in studies of excessive speculation, including issues with the quality of the underlying data,¹¹ measurement errors, and missing variables, there are two sensitivities that are especially relevant for our purposes. The first involves the question of time (Grosche 2014; Mayer 2012; Schumann 2011; Frenk 2010). Given that the test is designed to examine relationships between variables over specific time periods, a key challenge is selecting the right time lag over which causal effects, to the extent that they exist, are actually exhibited and thus may be detected by the testing procedure. If the selected time lag is either too short or too long, the underlying causal relationships may be missed, thus yielding a false negative. One of the common bench-

marks in this literature is the one-week time lag used by Irwin and Sanders (2010) in their OECD study. Some critics have argued that this time lag is too short and is unable to pick up causal relationships between index trading positions and price that are more likely to unfold over weeks or even months (Singleton 2012; Schumann 2011; Frenk 2010). Schumann (2011) for one asserts that it is “nonsense” that Irwin and Sanders compared index positions and futures prices with only a seven-day delay: “This wouldn’t register the price effect of investor positions in commodity funds” (*ibid.*, 52). Critics also cite a study by Singleton (2012) as evidence that the use of longer time lags can produce positive results. This particular study looked at quarterly returns and found that commodity index investing indeed had a significant impact on prices. Others have argued the time lag may be too long with changes in trader positions producing almost immediate, intraweek or even intraday effects on prices, particularly in highly liquid markets (Gilbert and Pfuderer 2014; Mayer 2012). And yet, given that public CFTC data on trader positions is only available on a weekly basis, researchers are prevented from examining relationships over shorter time horizons.

The fact that GC is so time sensitive is especially problematic given the volatile nature of commodity markets. This creates further challenges in terms of model specification as relationships between commodity index traders and prices may only be apparent during particular market cycles. For example, in his analysis of position and price changes across eight selected commodities, Mayer (2012) found correlations only over specific subperiods such as peaks and turning points. In this respect, the volatility of commodities prices may itself present a problem. In fact, one of the commonly acknowledged limitations of GC is that it is not well suited to highly volatile dependent variables, of which prices are of course the perfect example: “prices do not possess the required formal properties for Granger-type tests to be reliable . . . commodities prices over the period studied were perfect examples of the kind of volatile variables that Granger tests can’t handle” (Frenk 2010, 7). All of this suggests that GC may lack the statistical power to detect price effects in rapidly moving markets (Grosche 2014).

A related concern is causal direction and feedback effects. GC is rooted in a linear as well as sequential notion of causality whereby causal relationships can only run in one direction at any given point in time: in our case, either from index trader positions to commodities prices or alternatively from price to position. Were causality to run in both directions simultaneously and with complex feedback effects, the hallmarks of a nonlinear relationship, the test would once again yield inconclusive or misleading results (Grosche 2012, 2014; Hoover 2001). And yet, these kinds of multidirectional relationships and contemporaneous feedback effects are standard fare in commodities markets where prices both reflect and inform trading activity, especially in markets increasingly defined by “technical trading” where transactions are driven by trends in market data including “price” and “open interest” (Talbot 2004). The result is an even more pronounced disconnect between

financial markets and the forms of linear causality and temporal sequencing presumed by GC.

A second essential sensitivity of GC involves the interpretation, or what Grosche (2014) refers to as the interpretability, of test results. Within the academic literature, the results of studies informed by GC are trumpeted as more rigorous and scientific alternatives to the mere speculations of the policy realm, the fodder for “serious statements” (Foucault 1989) on whether observed correlations between index investing and commodities prices are truly causal in nature. The results of statistical analyses are herein translated into, and reported as, findings about real-world causality. However, this belies a fundamental reality of GC. What this test actually provides is a measure of statistical rather than substantive or structural causality (Gilbert and Pfuderer 2014; Grosche 2014; Reiss 2009; Hoover 2001), one that is distinctly probabilistic in nature. All it can tell us is whether, by including information contained in the past of independent variable *x*, we can improve our predictions of independent variable *y*. The use of the term *causality* in this context is thus itself a misnomer. It is more accurate to say that GC examines whether two data series are correlated across time with this temporal ordering once again serving as an essential proxy for causality. In this respect, the test is open to the same criticism leveled against policy reports: that observed relationships are merely correlational rather than causal in nature. It is also the case that GC may tell us whether an effect or correlation is present but provide little information about its size or qualitative importance (Gilbert and Pfuderer 2014). The ultimate lesson is that care must be taken not to overstate the interpretive power of GC (Grosche 2014). Rather than determining whether excessive speculation *causes* price movements, all the test can determine is if the former *Granger causes* the latter, a distinction too often scanted in the academic literature.

THE NATURE OF MARKETS AND THE PROBLEM OF “PRICE”

Beyond the sensitivities and internal constraints of GC as a particular type of statistical test, there is also a more fundamental issue at the heart of the excessive speculation debate: the nature of price itself. In the majority of academic studies, commodities prices are viewed through the lens of neoclassical economics as fairly straightforward and unproblematic indicators of market activity, the aggregated expressions of the collective forces of supply and demand, and the distillations of all available market information. Epitomized by the “efficient markets hypothesis,” prices are thus both “real” and represent “true” reflections of the actual state of the markets. Interestingly, a similar view lingers in the accounts of speculation’s critics whose theory of excessive speculation as additional demand, pushing prices beyond their “normal” range and producing “artificial” prices divorced from market fundamentals, is itself firmly implanted in the intellectual framework of supply and demand and the very notion of a “right” and “proper” price (de Goede

2005). In this respect, both sides of the position limits debate may be seen to subscribe to a particular ontology of prices as “real things,” as part of the natural datum of financial markets and as objective signals of market activity. It is this presumed ontology that allows for the very possibility of thinking about markets and prices in causal terms and that informs the exercise of linking discrete market positions to specific price-based effects. And yet, it is unclear whether these assumptions actually hold in practice. For many economists, this way of thinking is itself symptomatic of a growing gap, or lack of ontological fit, between the formal dictates of econometric models and the social reality of markets and economies (e.g., Lawson 2003). This has inspired calls for new theoretical and methodological approaches with the return to qualitative methods appearing at the top of the list.

One such alternative approach, one that takes ontological complexity very seriously and is explicitly grounded in qualitative research, is informed by recent work in the Social Studies of Finance. Inspired by the tradition of science and technology studies and the seminal work of Michel Callon (1998), this literature challenges the standard view of financial markets as natural and autonomous spaces governed by the immutable laws of economic exchange. Drawing from ethnographic studies of trading rooms, commodities exchanges, and investment banks, markets are conceived instead as inherently social spaces constituted through social interactions and interpretive communities (MacKenzie 2004), themselves rooted in the local geographies of international financial centers (Sassen 2006; Thrift 1994; Thrift and Leyshon 1994). Markets are also viewed as distinctly material spaces performed and reproduced on a daily basis through an assortment of technologies, practices, and calculative devices (MacKenzie, Muniesa, and Siu 2007; Beunza, Hardie, and MacKenzie 2006; MacKenzie 2006, 2009). These technical mediations introduce a series of contingencies and contextualities that run counter to both neoclassical and many critical accounts of finance as a kind of endless, perpetual-motion machine (de Goede 2005).

Prices are conceived in similar terms as social, material, and technological accomplishments. They *reflect* the interactions between a host of financial actors and associated trading tactics and motives (Preda 2007), and they are the product of material devices and technologies of visualization, transmission, and calculation such as the stock ticker (Preda 2006, 2007), pricing algorithms and formulae (Muniesa 2007; MacKenzie 2006, 2009), visualization software (Pryke 2010), and analytical tools including market indices and reports (Caliskan 2010). In the case of physical commodities, such as wheat and corn, prices are further shaped by the material coordinates of production, storage, and distribution ranging from inventory levels and storage data, to planting intentions and projected yields, to weather reports (Williams 2014; Caliskan 2010). Collectively, these are what Caliskan (2009, 2010) refers to as the tools of price realization, and it is through these tools and associated forms of representational and interpretive labor that prices are made and therein made to appear real: “The market price is made

possible and visible through the tools of these calculations, not in the coming together of the two lines of supply and demand” (Caliskan 2009, 265). Rather than being determined by abstract economic forces, a price is thus fundamentally a “social thing” (Beunza et al. 2006, 742), the outcome of a “pragmatics of valuation” (Muniesa 2007, 390) in which the very objectivity of prices is produced and then subsequently taken for granted.

Prices also *do* many things (Muniesa 2007). They are themselves constitutive of market activities directly informing trading strategies such as arbitrage and technical trading, the former informed by the search for price discrepancies across markets and the latter by efforts to gauge future prices through the analysis of past prices (among other indicators). Prices further serve as interpretive tools shaping perceptions around whether the markets are going up or down, or are over- or undervalued. There is also a constant interplay of prices across different markets—the best example being the price of oil, whose daily and hourly fluctuations trigger adjustments in the prices of many other commodities as well as equities, an expression of the growing “financialization” of commodity markets (Williams 2014; Clapp 2012, 2014). Prices are thus self-referential. They invariably refer to, and are informed by, other prices. They also possess a distinctly indexical (rather than referential) quality. They are rooted in the social, material, and technological contexts of trading and the routines and practices of price realization, while at the same time informing these very contexts.

Building on the insights of SSF scholars, there are compelling grounds for challenging the view of the price that underlies the excessive speculation debate and thus questioning the validity and merits of the associated academic research. Efforts to test for the causal relationships between investor positions and commodities prices using statistics such as GC are invariably limited to the extent that they fail to acknowledge the ontological complexity of price as overdetermined and overdetermining, reflecting and at the same time refracting market activities, and as both a product and a cause for action. Prices cannot be reduced to a dependent (or independent) variable in a causal equation, and they are especially resistant to the notion of linear and sequential time, which underlie statistical tests, a necessary artifice of statistical testing but one that is incommensurate with the complex social and material reality of prices. The fact that the majority of studies have failed to find any consistent evidence of commodity index trader positions Granger-causing price does not mean that a causal relationship does not exist. It may simply exist in a form that cannot be captured by standard econometric techniques premised on the identification and isolation of discrete causal pathways. In other words, excessive speculation and commodities prices may indeed be causally related but not in any straightforward sense that is conducive to easy statistical disaggregation. Ultimately then, the limitations of GC are rooted in the very nature of price itself, the epistemological enterprise of econometrics herein bedeviled by the ambiguous ontology of real prices, a reality that will continue to frustrate the search for price-based forms of

financial harm and the effort to rationalize regulatory rulemakings using available econometric methods.

CONCLUSION

Amongst the flurry of commentaries and recommendations surrounding the CFTC's NPRM for the position limits rule, a comment letter from BlackRock makes a passing and seemingly innocuous reference to the question of whether the commission had "satisfied its *burden of proof*" (Medero 2011, 2), concluding later that the agency not only had not, but in light of the available empirical evidence, likely could not meet this burden: "All of the above sources illustrate the difficulty the Commission will have in meeting its *burden of proof* before adopting any final position limit rules" (ibid., 4). This reference to the burden of proof highlights two essential insights that follow from the foregoing analysis of the position limits debate and its interpretation in light of broader legal challenges to Dodd-Frank. The first is the growing influence of a distinctly legal logic on the regulatory process and the framing of regulatory rulemaking in terms of evidentiary standards normally reserved for the courts. The very notion that regulators bear an evidentiary burden that must be satisfied prior to the issuance of new rules is a marked departure from the long-standing deference to regulatory expertise and the ability of regulators to craft rules based on the exercise of "reasoned judgment" (CFTC 2013, 50). This shifting landscape of regulatory rulemaking has been bolstered by greater judicial oversight of the rulemaking process. The courts are now more willing and able to intervene in regulatory decisions, and legal challenges are part of the standard arsenal of affected parties with emphasis placed less on the reasonableness and more on the formal rigor of regulatory justifications. Regulators, for their part, are increasingly aware of, and attentive to, this judicial scrutiny bolstering their investments in quantitative data analysis and cost-benefit calculations (Kraus and Raso 2013). There are thus signs of an encroaching juridification of the regulatory sphere and a gradual erosion of the discretion and autonomy of regulatory agencies (Kraus and Raso 2013; Cox and Baucom 2012; Mongone 2012).

The second insight concerns the nature and meaning of "proof" itself as a specific *type* of evidentiary standard. Echoing the skirmishes over expertise, evidence, and admissibility that have played out in other legal and regulatory settings, part of the ripple effects of *Daubert* and of judges thinking more like scientists as well as statisticians (Mercer 2008; Jasanoff 2002), proof in this context reflects the epistemological privileging not only of causality over correlation, but also of a particular form of causality defined in purely statistical terms. These determinations of statistical causality are the preserve of a closed community of academic experts who, by virtue of their specialized knowledge and facility with the language of statistics, are uniquely authorized to speak out on these matters. In contrast, forms of oral and visual

evidence derived from experience, interviews, and testimonials, as well as more straightforward and easily accessible forms of data analysis relayed through graphs and tables, are deemed inadequate, the sign of a potential relationship, but not the type of conclusive proof demanded by academics and now seemingly by judges. The problem in the case of position limits is thus not a lack of evidence, but rather the absence of proof, a case of the privileging of epistemic form over economic substance. This ultimately speaks to the difficulties of translating what would appear to be strong and convincing evidence of harm into the knowledge frames and evidentiary formats demanded in and of the regulatory and legal sphere, “where the ‘smoking gun’ is in many respects the gold standard of proof” (Jasanoff 2002, 58). In the words of noted agricultural economist Scott Irwin (2012), “The bottom line is that we have yet to find a *smoking gun* that would convict index investors of the crimes they have been charged with.”

Ironically, the epistemic authority of these statistical tests persists despite what economists themselves recognize to be their significant limitations, a reflection of the constraints of formal statistical modeling and the demands of mathematical tractability (Swann 2006; Lawson 2003; Leamer 1983). As this article has argued, an even more fundamental concern involves the very nature of price itself. Despite the efforts of economists and econometricians to conceive of price in terms of the natural laws of the markets as an objectively measurable and thus scientific barometer of market activities, price is a social, cultural, and technological entity, part of the essential sociality and reflexivity of financial markets. As such, it is subject to multi-valent influences and complex lines of cause and effect that render it impervious to the types of statistical testing and strictly linear conceptions of causality (Scales 2009) associated with research on excessive speculation. It is not simply that financial regulators, such as the CFTC, are challenged by the demands of new evidentiary standards and judicial expectations and are frustrated by the limitations of available statistical tests, the implication being that more careful and rigorous research and/or more sophisticated tests are the order of the day. Rather, the very task of documenting market harms in terms of statistically rendered price-based effects may be impossible (see Spratt 2013). Thus, while impacting many areas of regulation and regulatory rulemaking, the fact that “harm” in the context of financial markets so often turns on invocations of price, whether in the context of excessive speculation, market manipulation, or insider trading, suggests that the heightened burden of proof is likely to weigh especially heavily on financial regulators and will continue to frustrate rulemaking under Dodd-Frank.

There are a number of implications that follow from this analysis. First, rather than capitulating to the demands for cost-benefit analysis and other forms of quantitative assessment, financial regulators should be encouraged to resist quantification and thus avoid a trap that is partially of their own making: “the SEC appears to have blindly walked into the trap it has set for itself by repeatedly framing justifications for the rule on costs and benefits. In

a sense, it now finds itself hoisted by its own petard” (Cox and Baucom 2012, 1840). As an alternative, regulators should be encouraged to draw attention to the limitations, pitfalls, and practical difficulties associated with these forms of quantitative analysis and thus make explicit the dangers of creeping expectations that come from the mere availability of these methodologies (Kraus and Raso 2013). While this advice applies most directly to the United States, where these developments are most visible and that is unique in the degree of regulatory oversight granted the courts, it also extends to Canada, the United Kingdom, Australia, and Europe, where there is a similar, although perhaps more subtle, push toward quantitative cost-benefit analysis and evidence-based regulation (Haines 2011; Black and Baldwin 2010; Black 2005; Hutter 2005). Consider, as well, the battles between the Basel Committee on Banking Supervision and the banking community over the committee’s proposals for stronger capital and liquidity requirements (see, e.g., Bank for International Settlements 2010).

To assist regulators with the move beyond quantification, more research is needed on how commodities markets actually function and, as per studies of the financialization of food, the specific ways in which financial interests, logics, and practices have come to influence these markets. This research should examine the entire range of players participating in commodities markets, their trading strategies and motives, and their responsiveness to and their impact on prices, as well as the influence of the technical aspects of markets such as storage practices, market intelligence, and contract conditions (Williams 2014; Caliskan 2010). The hope for this type of research is that it would provide a different view of financial speculation and its effects on commodities markets and thus an alternative lens and evidentiary base on which to imagine and justify future regulatory efforts. This is not to endorse any kind of simplistic juxtaposition between qualitative and quantitative evidence, nor to valorize the former relative to the latter. It is simply to engage in a much-needed rebalancing. If nothing else, by highlighting the complexities of markets and prices, this research might reaffirm the inherent limitations of statistical analyses and the impossibility of providing conclusive statistical proof of the causal connection between speculation and price, thus eliminating this collective illusion as a reference point for regulatory and judicial deliberations while reasserting the precautionary principle as an essential feature of regulatory rulemaking.

Second, further research is needed on the role of statistics and related forms of quantitative analysis in financial regulation. This would include a more detailed engagement with econometrics and its use within subfields, such as agricultural economics, which continues to play a key role in policy discussions around commodities markets and food security, and yet about which very little is actually known. Building on the work of Morgan (2012), Lawson (2003), and Ziliak and McCloskey (2004, 2008), emphasis would be placed on the parameters, assumptions, and sensitivities as well as the distinct social history of these statistics and how they have come to be translated

across different social and institutional sites. As per the Social Studies of Finance, attention should also be devoted to the role of econometrics and academic economists in actively performing rather than simply describing the markets, thus becoming an essential part of the very processes of market making and price realization that they purport to study. Research along these lines would likewise make an important contribution to the existing scholarship on “regulatory science” (Abraham and Davis 2013; Jasanoff 1990, 2011), which has largely focused on social and environmental regulation but has overlooked the role of “science” in the practice of financial regulation, a significant oversight given the increasing investments of regulators in forms of quantitative and statistical analysis. There are also interesting implications for SSF itself, which has helped to uncover the material and technical aspects of financial markets and prices, but which has yet to truly extend these insights into the world of financial regulation and related questions of law and legality (MacKenzie 2005). The analysis of econometrics and statistical cost-benefit analysis would provide an interesting opportunity to bridge this gap while making an important contribution to the evolving SSF literature.

Finally, this analysis offers important insights into the study of regulation more generally and its associated challenges and limitations. The prevailing tendency is to frame regulatory struggles in terms of either interests (including forms of conflict, capture, and inertia) or deficits (namely, in skills, expertise, and resources). This is particularly true of the financial sphere, which is viewed as especially susceptible to these kinds of influences given the economic clout and power wielded by the industry, the informational and experiential deficits of regulators, and the constantly revolving door between these two worlds. Indeed, many accounts of the trials and tribulations of the SEC and the CFTC in relation to Dodd-Frank have followed exactly these scripts (Edwards 2013; Kraus and Raso 2013; Krawiec 2013; Rivlin 2013; Cox and Baucom 2012). If not motives, skills, and interests, regulation is seen as being thwarted by the fostering of ambiguity, uncertainty, and dissensus on essential evidentiary questions with this same strategy being successfully deployed in past debates on smoking and cancer, global warming, and toxic torts. In this respect, the position limits debate may be viewed as simply another occasion where scientific uncertainty (Edwards 2010) and the “myth of causation” (Scales 2009) have been used to scuttle regulatory action (Schumann 2011).

In contrast, the analysis presented in this article suggests that to understand regulatory struggles we need to place more emphasis on the epistemic challenges underlying the regulatory enterprise. There is no denying that the push toward quantification and associated evidentiary challenges is part of a larger industry strategy to dodge Dodd-Frank and has been invoked explicitly with this end in mind. Accounts of academics being hired to provide the intellectual grounds and rationalizations on which to impeach proposed rules (Fang 2013; Kocieniewski 2013) only serve to bolster this case, revealing the depths of industry machinations. And yet, at the same

time, the evidentiary struggles surrounding the position limits debate cannot be reduced to a mere epiphenomenon of power plays and interest-based politics; rather, they are also informed by what I have elsewhere described as a “politics of knowledgeability” (Williams 2012). This speaks to the micropolitics of knowledge production including how certain forms of expertise and associated knowledge claims come to be privileged over others not as “an inevitable outcome of science or money or political power but a matter of social history that needs unpacking” (Suryanarayanan and Kleinman 2012, 226). This social history includes the progressive institutionalization of a particular set of epistemological conventions, themselves rooted in larger civic epistemologies (Jasanoff 2012) and cultural habits of thought (Scales 2009). Addressing the limitations of regulation thus requires that we intervene in these micropolitics, including, as intimated above, identifying the contingencies and fragilities surrounding econometric analyses and challenging prevailing academic and juridical epistemologies. It is only through this type of more nuanced critique, and more active repoliticization of seemingly technical matters and long-settled questions of markets and prices, that we can engage in more informed discussions regarding not only the limitations, but also the appropriate shape of regulation both within and beyond the world of finance.

NOTES

1. This was the original designation for the position limits rule when first proposed on January 26, 2011. It has since undergone numerous iterations with the most recent (December 12, 2013) version of the rule identified in *Federal Register* 78, no. 239 (December 12, 2013): 75679. <http://www.cftc.gov/LawRegulation/FederalRegister/ProposedRules/2013-27200> (accessed January 18, 2015).
2. Position limits consist of a limit or cap on the number of derivatives contracts that any single individual or entity may hold or control during a specified time period.
3. Introduced on March 5, 2013, by Senator Richard Shelby, the bill has been referred to the Senate Banking, Housing, and Urban Affairs Committee where it awaits further discussion and debate.
4. *Federal Register*, 76, no. 17 (January 26, 2011): 4752.
5. Swaps are customized futures or option-like instruments traded on the over-the-counter market. Since 2000, swap dealers have been exempted from the Commodity Exchange Act and thus the position limits regime based on the argument that they are performing a legitimate hedging function rather than engaging in speculative trading. This has come to be known as the “swap dealer loophole.” It was these exemptions that spurred the growth of the commodity index market allowing offering institutions to hedge their exposures by taking large offsetting positions in agricultural futures markets (Clapp 2012; Ghosh 2010; Kaufman 2010). Dodd-Frank provides for the closure of this loophole.
6. See <http://comments.cftc.gov/PublicComments/CommentList.aspx?id=965> (accessed January 18, 2015).
7. Opening Statement, Public Meeting on Final Rules under the Dodd-Frank Act (October 18, 2011), <http://www.cftc.gov/PressRoom/SpeechesTestimony/dunn-statement101811> (accessed January 18, 2015).

8. Statement of Dissent, Position Limits for Futures and Swaps (October 18, 2011), <http://www.cftc.gov/PressRoom/SpeechesTestimony/omaliastatement101811d> (accessed January 18, 2015).
9. See note 1.
10. From the CFTC's perspective, this reflects a very selective reading of the recent legislative and regulatory record and conflicts with its position that the statutory language of "finds as necessary" is itself ambiguous, serving as an acknowledgment of agency discretion rather than a firm evidentiary requirement. The agency says as much in its appeal, stating that the court's reference to the necessity findings from the 1940s and 1950s ignored the ambiguity of the "finds as necessary" language and, as a result, "misconstrued the section's more recent and relevant history" (CFTC 2013, 24).
11. In particular, concerns have been raised regarding the quality of weekly CFTC data on trader positions released through its Commitments of Traders Reports (COT) and Disaggregated Commitments of Traders Reports (DCOT). These reports disaggregate trader positions in the major commodities exchanges according to four categories: (1) producers and merchants; (2) swap dealers (i.e., commodity index traders); (3) money managers (e.g., hedge funds and pension funds); and (4) other reporting traders (commodity funds and wealthy individuals). Some of the more widely cited problems with this data are that they exclude the over-the-counter market and non-US commodity exchanges; fail to reflect changes in trader categories and the blurring of hedging and speculation (Williams 2014; Clapp 2012, 2014; Murphy et al. 2012); and overlook the impact of "trading motives and strategies," which may be more informative with respect to trading activity than more conventional, sector-based taxonomies (Grosche 2014, 294).

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