

1-30-2015

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Recommended Citation

Andrew Verstein, *Benchmark Manipulation*, 56 B.C.L. Rev. 215 (2015), <http://lawdigitalcommons.bc.edu/bclr/vol56/iss1/6>

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BENCHMARK MANIPULATION

ANDREW VERSTEIN*

Abstract: Substantial scholarship has questioned whether market manipulation is impossible and regulation unnecessary. This Article challenges orthodox understandings of manipulation, showing that they reflect an obsolete view of markets. While manipulation skeptics discuss *prices*, markets focus on *benchmarks of price*—and so do the manipulators who prey upon them. Benchmarks such as LIBOR or the S&P 500 summarize market prices and they have become essential to contemporary markets. They are written directly into industrial contracts, financial derivatives, statutes, and regulations, and so their accuracy affects the economy every bit as much as the prices themselves. They are also much easier to manipulate than underlying prices, because such benchmarks are typically derived from only a small slice of the market. For example benchmarks of exchange rates—the price of Euros and Yen—reflect only trade prices in a single venue, during a two-minute period of trading. If a manipulator can strategically position trades—placing aggressive purchases on that venue and aggressive sales elsewhere—they can bias the benchmark and therefore project influence over the market as a whole. As manipulation becomes increasingly synonymous with benchmark manipulation, it becomes clear why the recent push by regulators and courts to require fraud in manipulation cases is fundamentally misguided and how a better approach might be fashioned. Likewise, recent proposals to extensively regulate the creation of benchmarks are shown to misunderstand the mechanics of benchmark manipulation.

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* Assistant Professor of Law at Wake Forest University School of Law. For their helpful comments on drafts, I thank Andrew Blair-Stanek, Christopher M. Bruner, John F. Coyle, Jaime Dodge, Heather Elliott, Robin Ephran, Mirit Eyal-Cohen, Adam Feibelman, Stavros Gadinis, Erika Gorga, Elisabeth de Fontenay, Ann Graham, Alex Yoon-Ho Lee, Catherine Kim, John Korzen, Eugene Mazo, Rebecca Morrow, Henry Ordower, Alan Palmiter, Wilson Parker, Tanya Marsh, Gabriel Rauterberg, Sally Richardson, Roberta Romano, Laura Rosenbury, Sharon Rush, Greg Scopino, Greg Schill, Mark Seidenfeld, Mark Spottswood, Mark Weidemaier, Steve Thel, and Wentong Zheng. Colleen Baker, Sarah Brown, Albert H. Choi, Benjamin Edwards, Michael D. Guttentag, Sarah Haan, Joan MacLeod Heminway, Edward Janger, Liz Johnson, Grace Lee, Sally Irvin, Geoffrey Manns, Jeremy Kidd, Anita Krug, Tom C. W. Lin, Sid Shapiro, Ron Wright. Participants in the Southeastern Association of Law Schools New Scholar's Colloquium, the International Business Law Scholars' Roundtable at Brooklyn Law School's Dennis J. Block Center for the Study of International Business Law, the National Business Law Scholars conference at Loyola University, the Southeast Junior/Senior Law Professor Workshop, and the Washington & Lee University Faculty Workshop also provided helpful comments. Sally Irvin, Liz McCurry Johnson, and John Sanders helped greatly with research.

Do not falsify measurements, whether in length, weight or volume. You must have an honest balance, honest weights, an honest dry measure, and an honest liquid measure.

—Leviticus 19:35-36

INTRODUCTION

This is a period of unremitting market manipulation. Allegations have rocked the markets in interest rates,¹ foreign currency,² gold,³ palladium,⁴ milk,⁵ oil,⁶ biofuels,⁷ natural gas,⁸ and aluminum,⁹ to say nothing of the inexorably rising tide of stock price manipulation.¹⁰ By all accounts, manipulation is in its season.¹¹

This should be impossible. The scholarly consensus as to the economics of manipulation is skeptical, to say the least.¹² To drive up the global price of

¹ *LIBOR: The World's Most Important Number*, MONEYWEEK (Oct. 10, 2008), <http://www.moneyweek.com/personal-finance/libor-the-worlds-most-important-number-13816>, archived at <http://perma.cc/QM8K-CPQN>; see Halah Touryalai, *This Is Why Wall Street Hates Admitting Wrongdoing*, FORBES (Oct. 31, 2013), <http://www.forbes.com/sites/halahatouryalai/2013/10/31/this-is-why-wall-street-hates-admitting-wrongdoing/>, archived at <http://perma.cc/5XKW-JS4P>.

² See *In re Citibank, N.A.*, CFTC No. 15-03 (Nov., 11, 2014), available at <http://www.cftc.gov/ucm/groups/public/@lrenforcementactions/documents/legalpleading/enfcitibankorder111114.pdf>, archived at <http://perma.cc/V7NG-6E22>.

³ Madison Marriage, *Gold Price Rigging Fears Put Investors on Alert*, FIN. TIMES, Feb. 24, 2014, at 1 (retracted article describing widespread manipulation in gold market).

⁴ Christopher Louis Pia, CFTC No. 11-17, 2011 WL 3228315, at *1 (Commodity Futures Trading Comm'n July 25, 2011).

⁵ Allison Fitzgerald, *Why Dairy Farmers Are in a Sour Mood*, BLOOMBERG BUSINESSWEEK MAGAZINE (May 27, 2010), http://www.businessweek.com/magazine/content/10_23/b4181026633805.htm, archived at <http://perma.cc/C4XL-TBDX>.

⁶ Justin Scheck & Jenny Gross, *Traders Try to Game Platts Oil-Price Benchmark*, WALL ST. J., June 19, 2013, at A1, available at <http://online.wsj.com/news/articles/SB10001424127887324682204578517064053636892>, archived at <https://perma.cc/5XFU-JNNN?type=pdf>.

⁷ Ajay Makan et al., *European Commission Raids Oil Groups Over Price Benchmarks*, FIN. TIMES, May 14, 2013, <http://www.ft.com/intl/cms/s/0/f1574eb6-bca2-11e2-b344-00144feab7de.html>, archived at <https://perma.cc/S565-896V?type=pdf>.

⁸ Javier Blas, *Regulators Probe UK Natural Gas Market*, FIN. TIMES, Nov. 13, 2012, at 17, available at <http://www.ft.com/intl/cms/s/0/611cc5c2-2d02-11e2-9211-00144feabdc0.html?siteedition=intl#axzz2uWm2Ydzi>, archived at <https://perma.cc/Q3SM-ZN5P?type=pdf>.

⁹ David Kocieniewski, *A Shuffle of Aluminum, but to Banks, Pure Gold*, N.Y. TIMES, July 21, 2013, at A1, available at http://www.nytimes.com/2013/07/21/business/a-shuffle-of-aluminum-but-to-banks-pure-gold.html?_r=0, archived at <https://perma.cc/8Q2S-A72Y?type=pdf>.

¹⁰ See generally, e.g., MICHAEL LEWIS, *FLASH BOYS* (2014) (describing allegedly manipulative conduct by high frequency traders).

¹¹ Cf. *Deuteronomy* 11:14 (“[T]hen I will send rain on your land in its season . . .”).

¹² Daniel Fischel & David Ross, *Should the Law Prohibit “Manipulation” in Financial Markets?*, 105 HARV. L. REV. 503, 553 (1991). See generally Tālis J. Putniņš, *Market Manipulation: A Survey*, 26 J. ECON. SURVS. 952 (2012) (discussing literature on market manipulation, including contemporary empirical models).

an asset—such as silver—you have to buy a truly enormous amount. But you haven't gotten rich unless you can sell at the inflated price, and whatever forces raised the price while you bought will reverse when you try to sell. In theory, the plummeting price should precisely evaporate your profits. And in the meantime, you had to pay to transport and store a quarter of the world's silver.¹³ If theory predicts that it is hard to manipulate prices, then why is manipulation so widespread?

This Article argues that manipulation scholarship and law both reflect an outdated view of markets. Both are fixated on prices. But markets care relatively little about prices. Instead, they care about *price benchmarks*, and so do the manipulators who prey upon them.

Price benchmarks are institutions that represent prices.¹⁴ For example, the Dow Jones Industrial Average (DJIA) approximates the stock market, the Consumer Price Index (CPI) summarizes the cost of living. Markets are far too vast and complex, and the notion of “price” far too elusive, for anyone to actually do much with prices. Toyotas are sold and resold all around the country, with different features and quality levels. No rational person would try to discover and analyze all this data. But no one wants to overpay either. So you might rationally consult the Kelley Blue Book for its assessment of the 2013 Camry you have been eyeing. Price benchmarks, such as the Kelley Blue Book, compile market data and distill it into a single comprehensible number.

Benchmarks serve us well, but their rise is a mixed blessing. Our increasing reliance on benchmarks has made them an attractive target for manipulation. We trust these benchmarks enough to write them into contracts, administrative regulations, and statutes. Once the benchmark is hardwired into legal relationships, manipulating the proxy pays off just as much as manipulating the underlying reality.¹⁵ If the manipulator has agreed to sell oil at the benchmark price, tampering with the benchmark has the same effect as moving the worldwide supply of oil.¹⁶

¹³ Storage costs are more obvious for physical assets than for securities, but the holding costs remain in any case. See *infra* note 45 and accompanying text.

¹⁴ See *In re LIBOR-Based Fin. Instruments Antitrust Litig.*, 962 F. Supp. 2d 606, 612 n.5 (S.D.N.Y. 2013) (“LIBOR, of course, does not correspond to any actual interest rate charged for the use of U.S. dollars, but rather is an index based on the LIBOR panel banks’ estimates of the rate at which they would be able to borrow funds.”), *appeal dismissed*, No. 13-3565-L, 2013 WL 9557843 (2d Cir. Oct 30, 2013), *cert. granted sub nom.* *Gelboim v. Bank of Am. Corp.*, 134 S. Ct. 2876 (2014).

¹⁵ See, e.g., *id.* at 612–13 (discussing the relationship between Eurodollar futures contracts, LIBOR, and the market LIBOR is intended to represent—interest rates for three-month U.S. dollar deposits in foreign banks). Because Eurodollar futures cite LIBOR in their contracts, these future contracts can be manipulated either by influencing LIBOR or by influencing the underlying market for USD. See *id.*

¹⁶ See *infra* notes 144–175 and accompanying text.

At the same time, it is considerably easier to bias a benchmark. By their nature, benchmarks describe a market based on some small slice of it. Careful manipulators can bias that slice. It is daunting to corner the world currency market, but it is less daunting to corner the two percent of the market whose price is considered by the leading benchmark.¹⁷ By shrinking the domain over which the manipulator must exercise influence, benchmarks directly circumvent the principal challenges to manipulation identified by scholars.

This Article contends that market manipulation is increasingly synonymous with benchmark manipulation. This account is at odds with the assumptions now regnant in manipulation scholarship.¹⁸ One recent article by leaders in the field flatly asserts that benchmark manipulation is not manipulation because its effects are not market-wide.¹⁹ On the contrary, because it is not market-wide, benchmark abuse is a viable form of manipulation. Other scholars allow for the possibility of benchmark manipulation, but no previous work has identified benchmark manipulation as a dominant form of contemporary market abuse, explained how it overcomes theoretical challenges to manipulation, or provided sufficiently granular analysis to guide pragmatic responses.

Owing to their attention to traditional price manipulation, scholars have missed the chance to give advice to policymakers at a time when government officials are actively seeking solutions. In the United States, courts are facing a flood of manipulation-related litigation.²⁰ In Europe, a debate rages about how to regulate the benchmark sector to make it less vulnerable to manipulation to begin with.²¹ This Article seeks to redirect academic discussion in light of the character of contemporary manipulation to help inform law and policy in America and Europe.

The structure of the Article is as follows. Part I describes the academic treatment of manipulation, and the skepticism it has engendered. Part II explains how benchmarks operate and how they make ideal vectors for manipulation. Part III demonstrates those mechanics, using manipulation in three markets as case studies: foreign currency, crude oil, and equity securities. This Article will show that nearly all manipulation in each of these assets is, in fact, benchmark manipulation. Part IV then draws lessons from this analysis to help critique and improve law in America and elsewhere.

¹⁷ See *infra* notes 97–143 and accompanying text.

¹⁸ See *infra* notes 22–54 and accompanying text. But see Steve Thel, *\$850,000 in Six Minutes—The Mechanics of Securities Manipulation*, 79 CORNELL L. REV. 219, 248 (1994) (emphasizing how widespread reliance on price reports could support manipulative actions).

¹⁹ Albert S. Kyle & S. Viswanathan, *How to Define Illegal Price Manipulation*, 98 AM. ECON. REV. 274, 274 (2008).

²⁰ See *infra* notes 97–202 and accompanying text.

²¹ See *infra* notes 270–298 and accompanying text.

This last Part considers two classes of solutions. First, if the threat of litigation is to constrain manipulators, we must reverse many decades of conflating manipulation with fraud. Many manipulations do not involve fraud, as such, and this is true of benchmark manipulation. Instead, we must recognize benchmark manipulation as a distinctive form of market abuse. Fortunately, statutory language already exists to support this approach. Second, proactive solutions must be found to improve the integrity of benchmarks before manipulation occurs. This subpart engages proposals offered by regulators, providing topical advice to policy makers who are very actively considering solutions. As such, it provides advice at a time when policymakers are genuinely available to academic engagement relating to a vitally important topic.

I. THE ECONOMICS OF PRICE MANIPULATION

Elementary economics teaches that price is set by the interaction of supply and demand. As such, it might seem obvious that a manipulator can profitably manipulate an asset by buying up a great deal of the asset. Once the price rises, the manipulator can sell her holdings at the inflated price, escaping and leaving others to deal with the eventual return to reality. Fear of this kind of scheme influenced drafters of our principal market abuse laws, who believed that such manipulation played an important role in creating asset bubbles and subsequent crashes.²²

This intuitive view—that traders can harmfully, but profitably, move prices—has been subject to withering criticism. Some scholars have disputed it empirically.²³ The most trenchant critiques, however, are theoretical, seeking to overthrow the notion that manipulative trading is ever likely to occur.²⁴ Spe-

²² See, e.g., Pub. L. No. 86-70, 48 Stat. 74 (codified as amended in 15 U.S.C. § 77b (2012)); Pub. L. 93-479, 48 Stat. 881 (codified as amended in 15 U.S.C. § 78b (2012)); Grain Futures Act of 1922, Pub. L. No. 67-331, § 369(3), 42 Stat. 998, 999 (1922), *amended by* Futures Trading Act of 1982, Pub. L. No. 97-444, § 203(3), 96 Stat. 2294, 2298 (1983); S. Rep. No. 93-1131, at 2 (1974), *reprinted in* 1974 U.S.C.C.A.N. 5843, 5844 (manipulation may “demoralize the market to the injury of producers and consumers and the exchanges themselves”); 7 LOUIS LOSS & JOEL SELIGMAN, *SECURITIES REGULATION* 3200 n.213 (3d ed. 2003).

²³ See, e.g., Guolin Jiang et al., *Market Manipulation: A Comprehensive Study of Stock Pools*, 77 J. FIN. ECON. 147, 168–69 (2005) (showing that prominent 1920s “manipulators” had likely done no such thing, supporting the suggestion that politics must have driven the regulatory agenda); Paul Mahoney, *The Stock Pools and the Securities Exchange Act*, 51 J. FIN. ECON. 343, 344–45 (1999); see also Putniņš, *supra* note 12, at 952–67 (“Empirical research has been limited by the lack of data on manipulation.”); cf. Thel, *supra* note 18, at 287 (“We do not know how often prices are manipulated, how much harm manipulation does or how existing manipulation rules influence behavior.”).

²⁴ See, e.g., Joseph A. Cherian & Robert A. Jarrow, *Market Manipulation*, in 9 HANDBOOK IN OPERATIONS RESEARCH AND MANAGEMENT SCIENCE: FINANCE 629 (1995); Joseph Cherian & Vikram Kuriyan, *Informationless Manipulation in a Market Maker-Type Economy*, 1–4 (Bos. Univ. Sch. of Management, Working Paper No. 93-49 1993) (concluding that manipulation is not possible under standard economic assumptions). Another theoretical response argues that not all putative ma-

cifically, it has been argued that trade-based manipulation is “self-detering.”²⁵ That is, the economic challenges to manipulative trading are so daunting that it need not even be illegal.²⁶ No statute is needed to prevent traders from wasting their money on “sure-to-lose strategies.”²⁷

The manipulative trader faces two principal challenges. First, manipulative trading is predicated on the notion that trades can move market prices, but those movements are likely to occur in just such a way as to negate all profits:

When a trader tries to buy a stock, he drives up the price. When he tries to sell it, he drives down the price. Thus, any attempt to manipulate the price of a stock by buying and selling requires the trader to “buy high” and “sell low.” This is the reverse of what is required to make a profit.²⁸

Unless the manipulator can escape this fearful symmetry, her scheme will not allow her to profit from her artificial price.²⁹

Second, manipulative trading entails substantial costs and risks for the manipulator. Many large purchases of assets fail to have any price impact at all.³⁰ To raise the price of an asset by two or three percent might require purchasing two or three percent of the outstanding supply of a very large market.³¹ The market capitalization of Apple, to take one bloated example, is over \$683 billion,³² with over six billion dollars in daily trading volume.³³ Daily trading

nipulations are actually socially harmful when their price accuracy and liquidity effects are both taken into account. Kyle & Viswanathan, *supra* note 19, at 274–75.

²⁵ Fischel & Ross, *supra* note 12, at 512; *cf.* Thel, *supra* note 18, at 261 (“Manipulations that depend on profitable offsetting trades [i.e. trade based manipulation] are much more likely to be self-detering than contract-based manipulations—at least in the sense that the manipulator cannot be as confident of success.”).

²⁶ Fischel & Ross, *supra* note 12, at 512.

²⁷ *See id.* at 518.

²⁸ Franklin Allen & Douglas Gale, *Stock-Price Manipulation*, 5 REV. FIN. STUD. 503, 506 (1992); accord Fischel & Ross, *supra* note 12, at 512 (discussing the need to sell at the artificial price).

²⁹ *See* Putniņš, *supra* note 12, at 962 (discussing theoretical conditions that may allow for manipulation); Thel, *supra* note 18, at 268.

³⁰ Robert E. Holthausen et al., *The Effect of Large Block Transactions on Security Prices: A Cross-Sectional Analysis*, 19 J. FIN. ECON., 237, 245–46 (1987). Even large funds are often able to trade without influencing market price due to the alacrity of liquidity providers. *Cf.* Bruno Navarro, *Vanguard CIO: High Frequency Trading Cuts Costs*, CNBC (Oct. 18, 2012), <http://www.cnbc.com/id/049434073>, archived at <http://perma.cc/L2HU-JXJ9>.

³¹ Holthausen et al., *supra* note 30 at 237–38. Some former currency traders have estimated that at least 200 million euros would be needed to move an exchange rate. Liam Vaughan et al., *Traders Said to Rig Currency Rates to Profit Off Clients*, BLOOMBERG (June 11, 2013), <http://www.bloomberg.com/news/2013-06-11/traders-said-to-rig-currency-rates-to-profit-off-clients.html>, archived at <https://perma.cc/34CQ-YQ3Y?type=image>.

³² *Historical Prices, Apple Inc. (AAPL)-November 21, 2014*, YAHOO FIN., <http://finance.yahoo.com/q/hp?s=AAPL&a=00&b=18&c=2013&d=00&e=18&f=2013&g=d>, archived at <http://perma.cc/>

in gold likewise daunting, exceeding two hundred forty billion dollars per day.³⁴ In such large markets, even major players appear to have tiny stakes.³⁵ To impact the market price for an asset might require an outlay of billions of dollars.³⁶

This large outlay comes with large costs. First, there are transaction costs. Many assets are traded with a bid-ask spread. For example, a market maker in Catamaran Corporation stock might offer to buy for \$51.24 per share or sell at \$54.00 per share.³⁷ The difference between the bid price and ask price, \$2.76, is the market maker's profit from making one sale and one purchase. It is also the cost to a trader who buys and then promptly resells, sometimes called a "round trip."

If someone wished to profit from a manipulation of Catamaran stock, they would need to be able to move the price by at least \$2.76, or about five percent, in order to just break even on the trading costs.³⁸ Thus, any manipulative trade begins with a large negative expected value.³⁹ It is thought that manipulation is easiest for illiquid assets—those that are infrequently traded—because a large purchase or sale can make a splash in a small and placid market. In reali-

HGY8-Z66R (last visited Dec. 29, 2014); *Apple Reports Fourth Quarter Results: Strong iPhone, Mac, & App Store Sales Drive Record September Quarter Revenue & Earnings*, APPLE PRESS INFO., <http://www.apple.com/pr/library/2014/10/20Apple-Reports-Fourth-Quarter-Results.html>, archived at <http://perma.cc/YCY2-3TSZ> (last visited Dec. 29, 2014).

³³ YAHOO FIN., *supra* note 32. The boundaries between markets blur because of the possibility of substitutes. Even if one could buy all of the world's Apple stock, many investors would not mind shifting to Microsoft. Fischel & Ross *supra* note 12, at 513–14; Myron S. Scholes, *The Market for Securities: Substitution Versus Price Pressure and the Effects of Information on Share Prices*, 45 J. BUS. 179, 181–82 (1972).

³⁴ Jack Farchy, *Sizing up the Gold Market*, FIN. TIMES, Sept. 9, 2011, <http://www.ft.com/intl/cms/s/0/eb342ad4-daba-11e0-a58b-00144feabdc0.html>, archived at <https://perma.cc/GWZ7-C5X6?type=pdf>.

³⁵ See Pratima Desai et al., *Goldman's New Money Machine: Warehouses*, REUTERS (July 29, 2011), <http://www.reuters.com/article/2011/07/29/us-lme-warehousing-idUSTRE76R3YZ20110729>, archived at <http://perma.cc/47UB-JF53>. Goldman Sachs has lately been associated with manipulative efforts in the aluminum industry, owing to its ownership of some of the world's largest and most important warehouses. But those warehouse store only about 1.1 million tons of the forty-five million consumed in 2011, a mere 2.4% of the \$100 billion market. See *Primary Aluminum Consumption 2011–2013*, EUROPEAN ALUMINUM ASS'N, <http://www.alueurope.eu/consumption-primary-aluminium-consumption-in-world-regions/>, archived at <http://perma.cc/AV8B-MBT5> (last visited Dec. 31, 2014); *Aluminum Prices and Aluminum Price Charts*, INVESTMENTMINE, <http://www.infomine.com/investment/metal-prices/aluminum/>, archived at <http://perma.cc/VTR3-AFHM> (last visited Dec. 29, 2014).

³⁶ Cf. Vaughan et al., *supra* note 31 (echoing the thoughts of finance professor, Andy Naranjo, that the large and competitive FOREX market would be hard to influence).

³⁷ *Summary: Catamaran Corporation (CRTX)*, YAHOO FIN., (Nov. 12, 2014, 4:14PM), <http://finance.yahoo.com/q?s=CRTX>, archived at <http://perma.cc/L5SC-T9AC>.

³⁸ The manipulation would need to be even higher if brokerage fees were also charged.

³⁹ See Fischel & Ross *supra* note 12, at 518.

ty, however, these are precisely the assets for which bid-ask spreads are widest and the trading costs highest.⁴⁰

Second, there are carrying costs. Taking delivery of assets can be costly. The notorious Hunt brothers, two Texas tycoons, once owned about half of the world's deliverable silver in what many regarded as a manipulative scheme.⁴¹ In order to hoard silver, they could not just buy silver futures; they had to actually receive truckloads of silver and warehouse it. Transportation, storage, and insurance costs can be substantial for any physical asset. Imagine the challenges to hoarding fresh eggs,⁴² uranium,⁴³ or ice.⁴⁴

The cost to receive and hold securities in an age of electronic markets may be lower than that of physical assets, but the costs are still substantial. All investments, manipulative or otherwise, bring opportunity costs.⁴⁵ The money spent acquiring a pool of Apple stock is money that cannot be deployed productively elsewhere.

Opportunity cost is not just investment gain forgone, it is risk imprudently accepted. It is tautological that a large buyer of a single asset forgoes diversification. Portfolio Theory demonstrates that diversification is the only free lunch in the financial markets.⁴⁶ Investors who buy a wide basket of goods avoid idiosyncratic risk with no reduction in expected returns. The Hunt brothers learned this cost of insufficient diversification, too: billionaires when they started building their silver empire, they lost the majority of their family wealth when the price of silver dropped by fifty percent on a single Thursday.⁴⁷

An investor who buys a mammoth quantity of any asset exposes herself to the idiosyncratic risk that her investment may fail. After also accounting for

⁴⁰ *Id.* This is not a coincidence. Bid-ask spreads are a function of, inter alia, inventory costs and adverse selection risk. High spreads are to be predicted in markets where scarcity or low turnover makes information trading more likely.

⁴¹ See *Minpeco, S.A. v. Hunt*, 718 F. Supp. 168, 170–71 (S.D.N.Y. 1989); Robert D. McFadden, *Nelson Bunker Hunt, 88, Oil Tycoon with a Texas-Size Presence, Dies*, N.Y. TIMES, Oct. 22, 2014, at A24; Mathilde Arandia, *The Fame and Folly of Cornering a Market: The Hunt Brothers and Silver*, FORTUNE, http://money.cnn.com/galleries/2010/fortune/1008/gallery.corner_markets.fortune/4.html, archived at <http://perma.cc/TT5A-B6YP> (last updated Aug. 13, 2010).

⁴² *Great W. Food Distrib., Inc. v. Brannan*, 201 F.2d 476, 480–84 (7th Cir. 1953) (involving fresh egg manipulation).

⁴³ *In re Westinghouse Elec. Corp. Uranium Contract Lit.*, 436 F. Supp. 990, 991–94 (J.P.M.L. 1977) (involving conspiracy to manipulate price of uranium).

⁴⁴ See, RICHARD O. CUMMINGS, *THE AMERICAN ICE HARVESTS: A HISTORICAL STUDY IN TECHNOLOGY, 1800–1918*, at 14–15 (1949) (explaining how melting ice was a major obstacle to competitive prices).

⁴⁵ We might reasonably characterize opportunity costs and risk to be a type of carrying cost.

⁴⁶ HARRY M. MARKOWITZ, *PORTFOLIO SELECTION: EFFICIENT DIVERSIFICATION OF INVESTMENTS* 5 (2d ed. 1991).

⁴⁷ Arandia, *supra* note 41.

trading costs, the manipulator faces large costs to attempt her scheme. And for what? Symmetrical price movement suggests that the manipulator should not even expect to sell for gain. Indeed, the challenges to manipulative trading seem daunting.

Although skeptical arguments have been influential,⁴⁸ these difficulties have not persuaded all scholars that manipulative trading is a dead end.⁴⁹ Rather, theoretical models have been offered demonstrating the viability of manipulative trading,⁵⁰ and empirical projects have recently sought to provide validation.⁵¹ Many of these scholars would argue that manipulative potential is greatest where the manipulator has entered into contracts dependent upon mar-

⁴⁸ See, e.g., Merritt B. Fox et al., *Short Selling and the News: A Preliminary Report on an Empirical Study*, 54 N.Y.L. SCH. L. REV. 645, 653 (2010) (“[P]ure manipulations cannot be expected to yield much profit, if any, because the purchase orders needed to effect a cover will push prices up just as the sale orders prompted by the original short sale pushed them down.”); Kyle & Viswanathan, *supra* note 19, at 275–79; Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047, 1104 n.220 (1995) (“It is not universally accepted that manipulation of securities prices can be a profitable strategy.”); Stephen Craig Pirrong, *The Self-Regulation of Commodity Exchanges: The Case of Market Manipulation*, 38 J.L. & ECON. 141, 142–43 (1995); Thel, *supra* note 18, at 219–24; see also Markowski v. SEC., 274 F.3d 525, 528 (7th Cir. 2001) (“[M]anipulation schemes, in which the manipulator simply buys a security in order to induce higher prices and then sells to take advantage of the price change, are likely to fail.” (citing Fischel & Ross, *supra* note 12)); Bd. of Trade of Chi. v. SEC., 187 F.3d 713, 725 (7th Cir. 1999) (“Whether even single-stock options and futures on physical commodities are subject to (reliably profitable) manipulation is an interesting question” (citing Fischel & Ross, *supra* note 12)).

⁴⁹ See, e.g., Thel, *supra* note 18, at 219–24; see also Robert A. Jarrow et al., *Market Manipulation and Corporate Finance: A New Perspective*, 22 FIN. MGMT. 200, 203–08 (1993) (reviewing models of manipulation); Zhi-Qiang Jiang et al., *Trading Networks, Abnormal Motifs and Stock Manipulation*, 1 QUANTITATIVE FIN. LETTERS 1, 1–2 (2013) (“[T]rade-based manipulation is easier to conduct and thus more common”); Donald C. Langevoort, *Taming the Animal Spirits of the Stock Markets: A Behavioral Approach to Securities Regulation*, 97 Nw. U. L. REV. 135, 161 (2002) (“Behavioral finance gives ample reason to suspect that trade-based schemes can succeed”).

⁵⁰ See, e.g., Franklin Allen & Gary Gorton, *Stock Price Manipulation, Market Microstructure, and Asymmetric Information*, 36 EUR. ECON. REV. 624, 624–25 (1992) (sales move prices less than purchases); William Goetzmann et al., *Portfolio Performance Manipulation and Manipulation-Proof Performance Measures*, 20 REV. FIN. STUD. 1503, 1503–08 (2007) (discussing conditions for manipulation of performance measures); Robert A. Jarrow, *Market Manipulation, Bubbles, Corners, and Short-Squeezes*, 27 J. FIN. & QUANTITATIVE ANALYSIS 311, 311–13 (1992). For further discussion on these kinds of theoretical models, see generally Putniņš, *supra* note 12.

⁵¹ See, e.g., Mark M. Carhart et al., *Leaning for the Tape: Evidence of Gaming Behavior in Equity Mutual Funds*, 57 J. FIN. 661, 661–63 (2002) (price changes at end of certain days suggest manipulation by fund managers); Carole Comerton-Forde & Talis J. Putniņš, *Stock Price Manipulation: Prevalence and Determinants*, 17 REV. FIN. 1, 4 (finding that for each prosecuted manipulation, more than three hundred instances go unaddressed); D.R. Gallagher et al., *Portfolio Pumping: An Examination of Investment Manager Quarter-End Trading and Impact on Performance*, 17 PACIFIC-BASIN FIN. J. 1, 2–3 (2009) (fund manager performance predicts manipulation); Pierre Hillion & Matti Suominen, *The Manipulation of Closing Prices*, 7 J. FIN. MARKETS 351, 351–53 (2004) (trading irregularities on Paris Bourse suggest manipulation); Sophie X. Ni et al., *Stock Price Clustering on Option Expiration Dates*, 78 J. FIN. ECON. 49, 50–53 (2005) (finding stock prices tend to converge at the strike price of associated derivatives at the expiration of those derivatives, suggesting manipulation).

ket price. For example, losses incurred from manipulating the price of a stock might be more than recovered from gains on financial derivatives betting that the stock price will be within or without a certain range.⁵²

Still, each of these scholars shares important assumptions with the skeptics: A manipulator's goal is to affect the overall market price, which he or she does by trading an enormous portion of the asset.⁵³ What separates these scholars from the skeptics is their belief that these hurdles can be cleared and that there exist a reasonably large number of cases where such a manipulation would be profitable.⁵⁴ But, as the next Part shows, the real manipulative opportunities emerge only after relaxing the assumptions that artificial price is the goal and that buying a large percentage of the total supply is the means.

II. THE MECHANICS OF BENCHMARK MANIPULATION

It is costly and difficult to move the worldwide price of an asset, but manipulators need not target the price as such. For most purposes, the "price" of

⁵² See Craig Pirrong, *Energy Market Manipulation: Definition, Diagnosis, and Deterrence*, 31 ENERGY L.J. 1, 3–6 (discussing various manipulative trading strategies, including "squeezes" and "corners"); see also Fischel & Ross, *supra* note 12, at 523 (stating that contract-based manipulation is not as self-detering as other forms of manipulation); Fox et al., *supra* note 48, at 654 (contract manipulation allows manipulator to "profit handsomely"). See generally Andrew N. Kleit, *Index Manipulation, the CFTC, and the Inanity of DiPlacido*, (Feb. 2009) (unpublished manuscript), available at <http://ploneprod.met.psu.edu/people/ank1/research-papers/kleit.manipulation.pdf>, archived at <https://perma.cc/FQ4R-X4D9?type=pdf> (describing manipulation in commodities markets that require manipulators to achieve gains from futures contracts that outweigh the cost of unloading their position). These accounts imagine that money can be made in the futures market to offset what is lost in the physical market. It is important to see that this is *not* coextensive with benchmark manipulation. First, those accounts contemplate the manipulator going to the physical market as a whole, although the benchmark manipulator strategically locates trades within the tiny slice observed by the benchmark. Second, many non-futures contracts, including spot contracts, cite benchmarks. Therefore, the phenomenon is more general than these accounts assume. Third, the relationship between spot prices and futures is often complex. In many markets, spot prices are best manipulated (perhaps in order to influence futures prices) by *forgoing* physical assets and instead buying *other* futures contracts. This is because some benchmarks of spot transactions infer extensive from futures markets.

⁵³ For example, Kumar and Seppi's model contemplates the manipulator profiting from payoffs from futures contracts. See Praveen Kumar & Duane Seppi, *Futures Manipulation with Cash Settlement*, 47 J. FIN. 1485, 1487 (1992). Kumar and Seppi assert that the futures payoff is based on "the prevailing spot price," and there is no suggestion that market prices generally could differ from prices for the purposes of the futures contract. *Id.* They seem to imply that the prices used to settle futures contracts can be drawn directly from market prices without discretion or distortion. See *id.* By contrast benchmark manipulation is possible because contracts seldom incorporate prevailing spot prices, and the proxies actually referenced are often drawn from only a subset of trading venues, traders, and times. See Kyle & Viswanathan, *supra* note 19, at 274 (excluding price quotation distortions designed to influence cash-settled prices from the definition of manipulation, "since effects are not market-wide").

⁵⁴ This Article does not seek to resolve the broad debate on the viability of price manipulation, nor need it: the possibility of benchmark manipulation constitutes an alternative means of manipulation. This argument is therefore partially independent of that debate.

an asset is conflated with “the price according to a leading benchmark.” Tampering with a benchmark is far easier and can have an equivalent impact to actually moving the real price of the asset. This section explains the mechanics of benchmark manipulation.

Market manipulation by way of a benchmark hinges on two general features of the benchmark. First, the degree to which it is *hardwired* into legal documents. If benchmarks were just information, participants would be free to disregard them when they diverge from the “real” price. But integration into contracts and laws renders the benchmark dispositive as a price. Section A explains hardwiring of benchmarks by contrasting it to “soft” or merely informational uses.

The second relevant feature is benchmarks’ *susceptibility to bias*. As Section B shows, benchmarks represent market prices but they are not identical with them. The benchmark may diverge from reality by accident, or because individuals decide to influence it. Susceptibility is largely a function of the voluntariness afforded participants,⁵⁵ and the relative concentration of the benchmark’s sample data.

A. Hardwiring

To understand hardwiring, it is first necessary to contrast it to informational or “soft” benchmark use. Price benchmarks are numerical summaries of market prices, and they are widely used to help individuals and entities make good decisions in an opaque and uncertain world. Examples of these benchmarks, and their uses, abound. A renter might consult the current Prime Rate to decide whether now is a good time to buy a house. An investor might compare her mutual fund’s returns to the S&P 500 as she decides whether to ditch it. An employee might cite the Consumer Price Index as he negotiates for a raise.

Consulting benchmarks is rational. We often want to know “the price” of some asset, but markets can be opaque and complex. There are substantial economies of scale in price discovery.⁵⁶ By centralizing this function in a benchmark provider, each user need only pay some share of the cost. Benchmark providers research markets, observe trends, identify recent transactions, and synthesize the totality into a single comprehensible number.

When individuals look to a benchmark to understand market conditions, benchmarks serve an informational function.⁵⁷ Use of benchmarks for infor-

⁵⁵ If most of the benchmark’s data is coming from users who can strategically decide what data to provide, then it will come as no surprise if results are biased.

⁵⁶ Gabriel Rauterberg & Andrew Verstein, *Index Theory: The Law, Promise and Failure of Financial Indices*, 30 YALE J. ON REG. 101, 112–14 (2013).

⁵⁷ *Id.*

mation is a sort of “soft” benchmark application because users must still decide how to use this information: will they trust it, reject it, or add it to the total mix of other data?

While soft benchmark use is important, “hard” applications of benchmarks, in which the benchmark is directly integrated into a legal relationship, are of arguably greater significance.⁵⁸ Hardwiring by private parties generally occurs in the form of a contract. By lodging a benchmark within a promise, promisors can make agreements that are both flexible and unambiguous.⁵⁹

Benchmarks are extremely common as price terms in long-term contracts.⁶⁰ Industrial groups use variable prices, which frequently cite a prominent financial benchmark, to control risk and improve the efficiency of their interactions.⁶¹ Labor unions negotiate salary escalator clauses for their employers, incorporating CPI into long-term employment arrangements.⁶² Establishing an enduring and impartial pricing scheme improves trust, lowers transaction and litigation costs, and encourages parties to make efficient investments in the relationship.⁶³

Benchmarks are utterly essential to the operation of financial derivatives.⁶⁴ Derivative contracts, such as call options and futures contracts, are financial assets that derive their value from the value of some other asset. Derivatives markets are thought to enable price discovery, allow risk-transfer, and reduce volatility.⁶⁵ Any financial derivative’s payment condition—where the rubber hits the road—is likely to cite a financial benchmark. It is unheard of for a derivative on, say, aluminum to entitle its owner to profit if “the price of aluminum” should go up on a certain day. But a similar contract that hinges on

⁵⁸ For a discussion on how hard applications can also be called “stipulative” uses, see generally Andrew Verstein, *When Prices Fail: Judicial Intervention in Long-Term Contracts* (unpublished manuscript) (on file with author).

⁵⁹ See Andrew Verstein, *Ex Tempore Contracting*, 55 WM. & MARY L. REV. 1869, 1924 n.289 (2014); see also Verstein, *supra* note 58.

⁶⁰ Cf. Rauterberg & Verstein, *supra* note 56, at 108–12 (describing contractual use of indices). See generally Verstein, *supra* note 58. Note, however, that indices are *not* limited to long-term contracts, because many spot contracts also cite index values. *Putting a Price on Energy: International Price Mechanisms for Oil & Gas*, ENERGY CHARTER SECRETARIAT 79–80 (Mar. 1, 2007), http://www.encharter.org/fileadmin/user_upload/document/Oil_and_Gas_Pricing_2007_ENG.pdf, archived at <http://perma.cc/LX6U-M424>.

⁶¹ Rauterberg & Verstein, *supra* note 56, at 112–14.

⁶² *Id.*, at 110.

⁶³ See *id.*, at 109–14.

⁶⁴ See *id.*, at 111–12.

⁶⁵ See *Cargill, Inc. v. Hardin*, 452 F.2d 1154, 1173 (8th Cir. 1971).

changes in “LME Official Cash Settlement Prices” of aluminum would be quite ordinary.⁶⁶

Public bodies also hardwire benchmarks. They do so for similar reasons to private hardwiring. By selecting an expert, disinterested benchmark providers can allow public bodies to clearly, consistently, and trustworthily communicate their intentions, and to obtain rational prices despite their lack of expertise in the subject matter.⁶⁷ As a result, statutes and administrative regulations commonly cite particular benchmarks by name. For example, the State of Alaska uses the benchmarks of one company, Platts, as the base from which oil tax and royalty payments are calculated.⁶⁸

The law often imposes benchmarks upon private actors, publicly endorsing private hardwiring. It is common for regulations to require private actors to use benchmarks. For example, exchange traded funds obtain broad exemptions from the regulations applicable to mutual funds, provided that they are based upon a third-party benchmark;⁶⁹ mortgages and other contracts obtain negotiability more easily if drafted to reference to a benchmark;⁷⁰ ERISA conditions the ability of fiduciaries to self-deal in currency trades for the retirement plans

⁶⁶ *LMESwaps Swaps Contract Specifications*, LONDON METAL EXCHANGE, <http://www.lme.com/metals/non-ferrous/aluminium/contract-specifications/lmeswaps/>, archived at <http://perma.cc/Q6EE-LGSV> (last visited Dec. 28, 2014).

⁶⁷ Mandating use of a benchmark can also reflect the paternalistic desire to ensure a given transaction meets market standards, or it can reflect administrability considerations. A benchmark requirement relieves law enforcers from establishing the relevant standard at trial.

⁶⁸ ALASKA ADMIN. CODE tit. 11, § 25.200(i) (2013) (designating Platts Oilgram Price Report as the recognized price of fuel expense.); ALASKA ADMIN. CODE tit. 15, § 55.171(m) (2013); BD. OF THE INT’L ORG. OF SEC. COMM’NS, PRINCIPLES FOR OIL PRICE REPORTING AGENCIES 4 (2013), available at http://www.csrc.gov.cn/pub/csrc_en/affairs/AffairsIOSCO/201210/P020121010499030150053.pdf, archived at <http://perma.cc/F4VP-9BXA>. Similar policies abound where the government is a buyer of commodities. See, e.g., *Behm Family Corp. v. Dept. of Energy*, 903 F.2d 830, 834 (Temp. Emer. Ct. App. 1990) (“Indeed, the [Department of Energy’s Office of Hearings and Appeals] has consistently and standardly used *Platt’s* in its market comparisons . . .”). Those policies also exist where the government seeks to regulate the prices that public utilities charge to customers. See *generally* *Natural Gas Purchase Incentive Regulation and Benchmarking*, STATE UTIL. FORECASTING GRP. & PURDUE UNIV. (July 2005) [hereinafter *Natural Gas Purchase Benchmarking*] (discussing incentive payment schemes based upon third party indices—many of which are mentioned by name).

⁶⁹ See Application for Exemption Under Section 6(c) at 21–22, Guggenheim Funds Inv. Advisors, LLC (Dec. 15, 2011), available at <http://www.sec.gov/Archives/edgar/data/1167303/000089180411005522/gugg53122-40app.html>, archived at <http://perma.cc/ZT43-XFJ7> (discussing need for third-party index provision); Exchange-Traded Funds, 73 Fed. Reg. 14,618 (proposed Mar. 8, 2008) (to be codified at 17 C.F.R. pts. 239, 270, 274) (would have codified existing exemptions).

⁷⁰ Compare U.C.C. § 3-104(1)(b) (1989) (requiring “a sum certain” that has been interpreted to permit variable rates only if produced by a verifiable and objective third party provider, prior to 1990 revision), with U.C.C. § 3-104 (2012) (permitting negotiability if obligation is for a “fixed amount of money,” after 1990 revision).

they supervise on limiting their prices by the relevant benchmark;⁷¹ federal law requires natural gas prices to be “fair and reasonable,” but prices linked to a market benchmark are presumptively valid.⁷²

The line between public and private hardwiring can blur as overlapping and interlocking uses interact.⁷³ Consider the chain by which milk gets its price.⁷⁴ Milk futures contracts, derivative bets on the price of milk, are hardwired to derive their price from U.S. Department of Agriculture minimum milk price. That number is derived almost entirely from the price that surveyed dairy farmers report being paid. Those farmers overwhelmingly sell with long-term contracts that hardwire the price of cheddar cheese reported on the Chicago Mercantile Exchange. Therefore, a few cheese mongers in Chicago set the price of milk across the nation through a byzantine process that defies easy characterization as public or private.

Users may have some choice of whether and which benchmark to use, but they thereafter lose some autonomy as to the implications of the benchmark’s movements. When legal documents reference a benchmark, the benchmark does more than inform about a price, it *constitutes* the price.⁷⁵ This creates the

⁷¹ 29 U.S.C. §§ 1106, 1108 (2012). Sometimes the government will require the creation of an impartial index. See Regulation NMS, 70 Fed. Reg. 37,496 (June 29, 2005) (to be codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249, 270) (requiring brokers to execute trades for their clients at or better than an official index of transactions).

⁷² Cf. *Medco Energi US, LLC v. Sea Robin Pipeline Co.*, 729 F.3d 394, 398 (5th Cir. 2013) (explaining that price benchmarks approved by a regulatory body is “per se reasonable and unassailable in judicial proceedings”).

⁷³ Another example would be the public appropriation of private soft uses of indices. Financial institutions’ internal assessments of risk often integrate market benchmarks, such as LIBOR. Myra R. Valladares, *Rate Manipulators May Distort Banks’ Market Risk Models*, N.Y. TIMES, June 25, 2014, http://dealbook.nytimes.com/2014/06/25/rate-manipulations-may-distort-banks-market-risk-models/?_php=true&_type=blogs&_r=0, archived at <https://perma.cc/R5VA-WAYF?type=pdf>. These internal rates can then be hardwired into regulatory processes. See generally Jonathan Macey, *The Regulator Effect in Financial Regulation*, 98 CORNELL L. REV. 591 (2013) (discussing instances where devices and institutions developed by private market participants are adopted into the law via regulations, as were credit rating agencies).

⁷⁴ See generally U.S. Gov’t Accountability Office, GAO-07-707, *Spot Cheese Market: Market Oversight Has Increased, but Concerns Remain about Potential Manipulation* (2007) (discussing how the spot cheese market, which is a primary component of the USDA minimum milk pricing formula, is susceptible to market manipulation). Perhaps it is no surprise that the dairy market has been rocked by manipulation given the allegations of other market abuses. See *Anderson v. Dairy Farmers of Am., Inc.*, No. 08-4726, 2010 WL 3893601, at *1 (D. Minn. 2010) (denying defendant’s motion to dismiss, and for interlocutory appeal); Louis F. Burke, *Civil Litigation Developments: Class Actions Alleging Manipulation*, 2013 A.B.A. Sec. Litig. 2–3, available at http://www.americanbar.org/content/dam/aba/administrative/litigation/materials/sac2013/sac_2013/1_CFTC_future.authcheckdam.pdf, archived at <http://perma.cc/3D4Q-WK3M> (explaining that *Anderson* settled for undisclosed sum).

⁷⁵ Contractual stipulation collapses the distinction between the price proxy and the price itself, the signifier and the signified. Cf. CHARLES SANDERS PEIRCE, *Some Consequences of Four Incapacities*, in 5 COLLECTED PAPERS OF CHARLES SANDERS PEIRCE 156, 172 (Charles Hartshorne & Paul Weiss

risk that the benchmark may go far afield, while remaining legally dispositive, to the detriment of one or more parties. Most first-year contract students learn this lesson from the 1975 Florida District Court case, *Gulf Oil v. Eastern Airlines*.⁷⁶ In that case, a fuel oil seller agreed to a long-term contract utilizing a leading industry benchmark (Platts's West Texas Sour Posted Price) for the price term. Some years into the contract, after substantial deregulation and international shortages had sent the market price of oil soaring, the Platts price remained low. Gulf Oil complained that it was stuck filling Eastern Airlines's fuel tanks for less than *half* of the real price. Despite heavy losses from the surprising divergence, and despite arguments persuasive to many that the price benchmark really had become inaccurate,⁷⁷ Gulf Oil was held to their contract.⁷⁸ The benchmark price had preempted the price.

Hardwiring interfaces benchmarks with legal obligations, providing a channel by which a manipulator can profit. A manipulator can profit from biasing a benchmark in a number of circumstances: establishing a speculative position with financial derivatives nearing expiration;⁷⁹ contracting to buy or sell an asset at some floating price;⁸⁰ linking compensation for services to a benchmark;⁸¹ varying legal price limits linked to a benchmark.⁸²

A benchmark is to price what a credit rating agency is to quality. People have long looked to credit rating agencies, such as Moody's and S&P, to inform them about the safety of certain investments. That information is a soft use. But credit rating agencies became most interesting, important, and destructive when their ratings were hardwired into various legal requirements.⁸³ Rather than requiring banks and insurance companies to hold "safe" assets (which they might find with the help of the bond ratings), regulators required them to hold highly-rated assets.⁸⁴ Once the rating was hardwired into a law or contract, it ceased to be a proxy for quality and became legally dispositive of quality; a triple-A rated mortgage backed security was officially safe even if

eds. 1958) (stating that signs only become such when we invest them with meaning). Hard uses of benchmarks undermine soft uses. The more parties stipulate using a benchmark, the less opportunity to make judgments on the basis of the benchmark.

⁷⁶ 415 F. Supp. 429, 432 (S.D. Fla. 1975).

⁷⁷ *Id.* at 432–44 (describing how the benchmarks diverged and could be considered inaccurate).

⁷⁸ *Id.* at 443.

⁷⁹ See e.g., *Commodity Futures Trading Comm'n. v. Delay*, No. 7:05CV5026, 2006 WL 3359076, at *1–3 (D. Neb. 2006).

⁸⁰ *SEC v. Masri*, 523 F. Supp. 2d 361, 363–65 (S.D.N.Y. 2007).

⁸¹ Carhart et al., *supra* note 51, at 666; Gallagher et al., *supra* note 51, at 2–3.

⁸² See *Natural Gas Purchase Benchmarking*, *supra* note 68, at 12–23.

⁸³ See generally Jeffrey Manns, *Downgrading Rating Agency Reform*, 81 GEO. WASH. L. REV. 749, 754–61 (2013) (describing law's prioritization of ratings, and resultant problems).

⁸⁴ *Id.* at 757–58.

plenty of other news implied that it was unsafe. The financial crisis of 2008 may have been largely caused by hardwiring of credit ratings.⁸⁵

Likewise, a biased benchmark influences the operation of the hardwired legal document *even if* everyone knows that it is biased. Unlike soft benchmark use, hard uses expose users to the risk of bias even apart from any continued reliance. It is therefore imperative to ask: are price benchmarks susceptible to bias?

B. Susceptibility to Bias

Price benchmarks are generally easier to manipulate than the prices they represent. Two factors—concentration and voluntariness—greatly influence the potential for bias.

1. Concentration

Benchmarks attempt to summarize a whole market from a subset of market information. This is reasonable. Benchmarks are most vital where it is infeasible to observe and consider every transaction and trend. Yet any approach that uses only a portion of market data gives outsized influence to those included data. By chance or design, a small market trend may appear large if it is localized entirely within the benchmark's dataset. As every social scientist knows, it is far easier to bias a sample than change a population.

A benchmark can exhibit three forms of concentration. First, "domain concentration" refers to how much of the plausible market is included in the benchmark's dataset. If a benchmark of corn utilized all corn prices, it would be essentially as hard to manipulate as the entire corn market. Conversely, a benchmark derived from transactions in a single ear of corn would be easily manipulated. While all benchmarks must draw lines between included and excluded data, robustness is endangered if the provider needlessly limits the data.⁸⁶ While it might seem that arbitragers would quickly equalize the prices within and without the benchmark's domain of data, barriers to arbitrage can

⁸⁵ See *id.* at 754 ("A broad consensus exists that rating agencies played a central role in the financial crisis . . . because a myriad of federal and state statutes and regulations deputize rating agencies as gatekeepers of credit risk.").

⁸⁶ For example LIBOR provided rates for the cost to borrow various currencies for various durations. The cost of borrowing Swedish Krona for seven months should look exactly like the cost of borrowing USD for seven months, plus a currency conversion fee. Yet, the British Bankers Association (BBA) explicitly instructed users not to utilize this methodology—they had to calculate the cost of borrowing directly. See *Definitions*, BRITISH BANKERS ASS'N, <http://www.bbalibor.com/explained/definitions>, archived at <http://perma.cc/FL7V-5HBS> (last visited Dec. 29, 2014). This methodological tunnel vision rendered each tenor of the benchmark less robust.

allow the included data to become orphaned from the market it is supposed to represent.⁸⁷

A second form of concentration, “participant concentration,” refers to the composition of traders operating within the benchmark’s domain. If only a few buyers and sellers dominate the trading observed by the benchmark, those few traders will have outsized influence over the benchmark rate.⁸⁸ We know to be skeptical of a market in which just a few traders, perhaps acquainted, effectively pass assets back and forth to one another. Conversely, even a relatively small domain of eligible transactions may be robust against bias if a large number of traders are at work.⁸⁹

A third form of concentration, “liquidity concentration,” refers to the amount and ease of trading within the benchmark’s domain. If a large number of trades take place within the domain, and if large trades tend to only slightly move the price, then the benchmark may be relatively robust. Nevertheless, even a benchmark with a large domain and many traders may be subject to influence if few trades actually take place. Then, the rare trade may effectively set the price.

2. Voluntariness

Biased samples may prove benign if the biases are distributed by chance. Many benchmarks, however, permit users to deliberately contribute (or omit) data to the sample, gaining strategic influence over the result. There are three possible methods for exercising such influence. First, the would-be manipulator can make, or omit to make, additional trades of whatever sort the bench-

⁸⁷ With perfect arbitrage, manipulation of the index’s domain would be no easier than the market as a whole. Market opacity—with resulting information asymmetries—can reduce arbitrage. *See, e.g.,* Kevin H.K. Cheng et al., *How Electronic Trading Affects Bid-Ask Spreads and Arbitrage Efficiency Between Index Futures and Options*, 25 J. FUTURES MARKETS 375, 377 (2005); Praveen Kumar & Duane Seppi, *Futures Manipulation with Cash Settlement* 47 J. FIN. 1485, 1495–96 (1992); Vladimir Atanasov et al., *Financial Intermediaries in the Midst of Market Manipulation: Did They Protect the Fool or Help the Knave?*, FIN. MKT. MISCONDUCT CONFERENCE 28 (Feb. 26 2014), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=240870 archived at <http://perma.cc/A94X-3C55>. Second, practical considerations and costs can reduce arbitrage correction. And apart from any frictions, there is extensive scholarship in the behavioral economics literature discussing psychological factors that may lead to persistent—even glaring—reluctance of prices to properly converge. *See generally* Andrei Schleifer & Robert W. Vishny, *The Limits of Arbitrage*, 52 J. FIN. 35 (1997) (modeling the effects of factors that hinder traditional arbitrage).

⁸⁸ It is common to think that participant concentration requires a few large traders. Pirrong, *supra* note 52, at 6 (“Only traders that are sufficiently large . . . profitably engage in such a manipulation.”). Yet one important way for participation to concentrate is for intermediaries to aggregate the trades of many customers. Then the nominally large trader is really the broker or hedged-dealer for many indirect participants.

⁸⁹ For example, the ABX, an index of mortgage backed securities, tracks only a tiny basket of securities, but it is extensively traded.

mark tabulates.⁹⁰ Because the choice of whether to trade is voluntary, the paired reporting of the trade becomes voluntary.

Second, the manipulator can fabricate trading data. She can lie to the benchmark provider, reporting a fictitious trade.⁹¹ Such frauds are sometimes documented through trades lacking in economic substance, such as a sale at a low price to a friend who has committed to sell back to you at the same price a few minutes later.⁹² In some cases, mere indications of interest—rather than a subsequent trade—are enough to influence the benchmark, but these too can be fraudulent.⁹³

A third technique involves exercising discretionary control over benchmark data without fibbing or making additional trades. Some benchmarks explicitly permit traders to decide whether or not to submit information relating to trades. Other benchmarks effectively permit strategic submission by ignoring trade data generated in certain venues. By deciding whether to report trades, or whether to trade in a venue the index ignores, traders can influence the index without really changing their trading behavior or lying. For example, a trader may trade at exactly the same prices on Monday and Tuesday, but the benchmark price may differ because she neglects to report her Monday trades.

Because this third form of manipulation takes place without necessarily making new trades, transactions and holding costs described in Part I would not apply, and a major challenge to manipulation would be avoided. That makes the third technique more attractive than the first technique.

It possesses another key attraction. The first two techniques—new trades motivated to move prices, or fraud—are certainly illegal.⁹⁴ The third technique however, is arguably not illegal.⁹⁵ In the words of the International Organization of Securities Commissions, an association of the world's market regulators, "[t]here is no contractual, legal or regulatory requirement to report . . .

⁹⁰ See *SEC v. Masri*, 523 F. Supp. 2d 361, 363–65 (S.D.N.Y. 2007) (describing where a trader made aggressive purchases during the last ten minutes of the trading day in order to affect the closing price, which operates like a benchmark); see also Christopher Louis Pia, CFTC No. 11-17, 2011 WL 3228315, at *2 (Commodity Futures Trading Comm'n July 25, 2011) (describing where a portfolio manager executed buy orders for futures contracts in the last ten seconds of the closing period in an effort to exert upward pressure on the settlement prices).

⁹¹ *In re Natural Gas Commodity Litig.*, 358 F. Supp. 2d 336, 344–45 (S.D.N.Y. 2005) (finding that allegations that defendants knowingly delivered false reports to trade publications were sufficient to state a Commodity Exchange Act claim).

⁹² Market abuse statutes prohibit such "accommodation" trades and "wash" trades.

⁹³ See Greg Scopino, *The (Questionable) Legality of High-Speed "Pinging" and "Front-Running" in the Futures Markets*, 47 CONN. L. REV. (forthcoming Spring 2015) (manuscript at 55–56) (discussing two cases where traders placed large orders, and subsequently cancelled them, in order to see the effect on a market benchmark and discern the demand for commodity futures at different price levels).

⁹⁴ See *infra* notes 203–269 and accompanying text.

⁹⁵ See *infra* notes 203–269 and accompanying text.

transactions to [benchmark providers]. It is therefore open to companies to report only those deals that are in their own best interests for the rest of the market to see.”⁹⁶

As one generates price data through trading, one generally gains a workable option to impact or not impact the price term in the many benchmark-reliant contracts. Within its confines, strategic submission presents a manipulative opportunity with little of the costs emphasized by manipulation skeptics or the risks of legal enforcement.

III. EXAMPLES OF BENCHMARK MANIPULATION

The previous Part identified the general features that render markets and their benchmarks prone to benchmark manipulation. This Part applies those insights to examples from three different markets to show that the insights are illuminative of the prevalence of manipulation risk in our economy.

A. Currency

It has been argued that manipulation of the market for U.S. Treasury bonds should be virtually impossible because of its large size.⁹⁷ The market for exchanging foreign currency, such as Euros for Yen, is about ten times as large.⁹⁸ If ever there were a market too large to manipulate, it should be the \$5 trillion a day foreign exchange market.⁹⁹

And yet, foreign exchange is the epicenter of wild manipulation by market insiders.¹⁰⁰ Britain’s chief market regulator recently called it the “biggest

⁹⁶ INT’L ORG. OF SEC. COMM’NS ET AL., OIL PRICE REPORTING AGENCIES 13 (Oct. 2011), available at http://www.iea.org/media/g20/4_2011_Oil_Price_Reporting_Agencies.pdf, archived at <http://perma.cc/CZ2Y-E3LE>. Generally, price-reporting agencies of all commodities are amenable to strategic data submission. Some have suggested that Regulation FD, an SEC rule regarding reporting obligations, and relevant provisions of Sarbanes Oxley might limit strategic disclosure, but that is not a natural inference from either document. See Bassam Fattouh, *An Anatomy of the Crude Oil Pricing System*, OXFORD INST. FOR ENERGY STUD., Jan. 2011, at 33, available at <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2011/03/WPM40-AnAnatomyoftheCrudeOilPricingSystem-BassamFattouh-2011.pdf>, archived at <http://perma.cc/8N98-KRS2>.

⁹⁷ Fischel & Ross, *supra* note 12, at 547.

⁹⁸ Compare Rime & Schrimpf, *supra* note 2, at 27 (FX trading about \$5 trillion per day), with *US Bond Market Trading Volume*, SIFMA, <http://www.sifma.org/research/statistics.aspx>, archived at <http://perma.cc/6PS5-GMP3> (last visited Dec. 29, 2014) (updating monthly data and noting that the total trading in Oct. 2014 was approximately \$791.9 billion).

⁹⁹ Rime & Schrimpf, *supra* note 2, at 27.

¹⁰⁰ See, e.g., *In re Citibank, N.A.*, CFTC No. 15-03 (Nov., 11, 2014), <http://www.cftc.gov/ucm/groups/public/@lrenforcementactions/documents/legalpleading/enfcitibankorder111114.pdf>, archived at <http://perma.cc/V7NG-6E22> (banks strategically offset some position outside of the polled window and venue); *Swiss Finance Ministry Retracts Comments on Forex Market Rigging*, REUTERS (Oct. 9, 2013), <http://www.reuters.com/article/2013/10/09/swiss-forex-idUSL6N0HZ1UI20131009>, archived at <http://perma.cc/BKZ3-TPEJ> (quoting Switzerland’s Finance Minister) (“It’s a fact that foreign

series of quantifiable wrongdoing in the history of our financial services industry.”¹⁰¹ Dozens of people have lost their jobs,¹⁰² many billions of dollars in fines have already been paid,¹⁰³ and regulators in many countries are gearing up for criminal prosecutions.¹⁰⁴ Employees at major banks met in chat rooms with names such as “the cartel,” to swap their customers’ secrets in order to organize coordinated run-ups in the price of a currency just before one of those customers made a large purchase.¹⁰⁵ By manipulating the price of the currency the customer needs, the customer gets a bad price and the trader gets a great one. Benchmark manipulation allowed these schemes to work where traditional price manipulation would certainly fail.¹⁰⁶

exchange manipulation was committed.”). Regulators in the UK, US, Switzerland, the EU, Singapore and Hong Kong have begun investigations. Christopher Matthews et al., *'Flipped' Bankers Aid U.S. in Foreign-Exchange Probe*, WALL ST. J., Sept. 14, 2014, <http://online.wsj.com/articles/flipped-bankers-aid-u-s-in-foreign-exchange-probe-1410733662>, archived at <https://perma.cc/WK5Y-XS6L?type=pdf>; Anjani Trivedi, *Singapore Joins Global Currency-Market Probe*, WALL ST. J., Oct. 24, 2013, <http://online.wsj.com/articles/SB10001424052702303615304579155080130234424>, archived at <https://perma.cc/6W6U-JD3J?type=pdf>; *EU Set to Act on Forex Manipulation Claims*, FIN. TIMES, Oct. 7, 2013, <http://www.ft.com/intl/cms/s/0/1215f8cc-2f6d-11e3-8b7e-00144feab7de.html#axzz2jmUjgc00>, archived at <https://perma.cc/BA8D-WM62?type=pdf>; Rachel Armstrong, *Hong Kong, New Zealand Investigate Banks for Alleged FX Manipulation*, REUTERS (Apr. 1, 2014), <http://www.reuters.com/article/2014/04/01/us-hongkongforex-idUSBREA300AW20140401>, archived at <http://perma.cc/L8QE-HGAJ>.

¹⁰¹ Pam Martens, *Top UK Regulator: People Have Good Reason Not to Trust Currency Rates Set by Big Banks*, WALL ST. ON PARADE (Feb 5, 2014), <http://wallstreetonparade.com/2014/02/top-uk-regulator-people-have-good-reason-not-to-trust-currency-rates-set-by-big-banks/>, archived at <http://perma.cc/EXH5-3U9P>.

¹⁰² See, e.g., Martin Arnold, *HSBC Fires Head of European Currency Trading*, FIN. TIMES, Dec. 10, 2014, <http://www.ft.com/intl/cms/s/0/77035b60-8059-11e4-9907-00144feabdc0.html>, archived at <https://perma.cc/7XM8-YBEK?type=pdf>.

¹⁰³ Suzi Ring et al., *CitiGroup, JPMorgan to Pay Most in \$4.3 Billion in FX in Rigging Cases*, BLOOMBERG NEWS (Nov. 12, 2014), <http://www.bloomberg.com/news/2014-11-12/banks-to-pay-3-3-billion-in-fx-manipulation-probe.html>, archived at <http://perma.cc/JY58-X4AQ>; see also Gina Chon & Tom Braithwaite, *JPMorgan Settles Forex Manipulation Lawsuit*, FIN. TIMES, Jan. 5, 2015, <http://www.ft.com/intl/cms/s/0/7c545192-9511-11e4-b32c-00144feabdc0.html?siteedition=intl>, archived at <https://perma.cc/7SVR-7NKW?type=pdf> (civil settlement).

¹⁰⁴ Jenny Anderson, *Britain's Serious Fraud Office Joins Extensive Foreign-Exchange Inquiry*, N.Y. TIMES, July 21, 2014, http://dealbook.nytimes.com/2014/07/21/another-british-regulator-joins-extensive-foreign-exchange-inquiry/?_php=true&_type=blogs&_r=0, archived at <http://perma.cc/WD6A-J49Y>; Caroline Binham & Sam Fleming, *Former Royal Bank of Scotland Trader Arrested in Forex Rigging Probe*, FIN. TIMES, Dec. 19, 2014, <http://www.ft.com/intl/cms/s/0/6f46e024-87be-11e4-9cd9-00144feabdc0.html>, archived at <https://perma.cc/57JR-URG2?type=pdf>.

¹⁰⁵ Jamie McGeever & Carmel Crimmins, *Soft Touch FX Regulation Falls Under Harsh Glare*, REUTERS (Mar. 7, 2014), <http://www.reuters.com/article/2014/03/07/us-britain-forex-manipulation-insight-idUSBREA2617020140307>, archived at <http://perma.cc/2235-F9TW>.

¹⁰⁶ Nations also attempt to influence exchange rates as part of their monetary or trade policies. This Article does not discuss that phenomenon. This is essential to cabin the scope of the project. It is also appropriate because the sovereign manipulation is likely to differ in means, focusing on aggregate price level rather than the benchmark alone, and ends from private manipulations.

Despite its large size, manipulation in the foreign exchange market is possible because of the widespread dependence upon and hardwiring of benchmarks that are susceptible to influence. The leading benchmarks of foreign currency exchange are derived from a tiny subset of trades. Specifically, the leading benchmarks are derived from trades mostly executed by a dozen sophisticated intermediaries during a narrow band of time, that are consciously submitted or omitted based on the effect on the benchmark. On the head of this pin dance all the angels of the world's largest financial market.

1. Hardwiring

The most important benchmarks of currency prices are the WM/Reuters rates.¹⁰⁷ Published by the World Markets Company and Thomson Reuters, these rates are derived from trades executed on Thomson Reuter's electronic brokerage.¹⁰⁸ They are calculated frequently, typically every half-hour—but the most important version is the one computed at 4pm London time.¹⁰⁹ This edition, known simply as “the London Fix,” is what most people think of when they think of exchange rates.¹¹⁰

This leading currency benchmark is extensively hardwired into legal relationships. WM/Reuters rates are used as settlement values for currency derivatives both on¹¹¹ and off exchanges,¹¹² meaning that they largely determine the

¹⁰⁷ *Foreign Exchange Benchmarks: Consultative Document*, FIN. STABILITY BD., 1 (July 15, 2014) [hereinafter *Foreign Exchange Benchmarks*], http://www.financialstabilityboard.org/publications/r_140715.pdf, archived at <http://perma.cc/596F-WNHD>.

¹⁰⁸ *Id.* For certain “Trade Currencies,” data from other trading platforms (EBS and Currenex) is also incorporated. *Id.* at 3. But for nearly 140 of the 158 covered currencies—many of them the least liquid—only one platform's data is consulted. See *Spot & Forward Rates Methodology Guide*, WM/REUTERS 3 (2010) [hereinafter *Spot & Forward Rates Guide*], <http://www.wmcompany.com/pdfs/026808.pdf>, archived at <http://perma.cc/TB3C-F432>. Throughout this discussion, matters are simplified by discussing benchmarks as though Reuters' rates were the leaders in each currency pair. Similar issues arise for the currency pairs that are generally represented through another benchmark service.

¹⁰⁹ *Id.* at 8. This is a great improvement over the early days of currency trading. One hundred years ago, trade rates were published only twice a week. JOHN ATKIN, *THE FOREIGN EXCHANGE MARKET IN LONDON 6–7* (2005). Market participants continued trading throughout the week at rates that were different from, but based upon, those fairly symbolic rates. *Id.*

¹¹⁰ *The FX Is in: Are Foreign-exchange Benchmarks the Latest to Be Manipulated by Bankers?*, ECONOMIST, Oct. 12, 2013, at 88, 88.

¹¹¹ Accelerated Rule Change Expanding OTC FX Swaps Clearing Offering, Exchange Act Release No. 34-65637, 76 Fed. Reg. 67,512, 67,513–14 (Nov. 1, 2011); Immediate Effectiveness of Rule Change Relating to Foreign Currency Options Closing Settlement Values, Release No. 34-60274 74 Fed. Reg. 34,611, 34,611–12 (July 16, 2009).

¹¹² *OTC FX Clearing*, CME GROUP, 8 (Nov. 2014), <http://www.cmegroup.com/trading/fx/files/otc-fx-clearing.pdf>, archived at <https://perma.cc/8L3B-KFDC?type=pdf>.

value of instruments worth some \$3.3 trillion in daily trading.¹¹³ About two trillion dollars more is traded in the “spot” market, and much of this trading will also hardwire the London Fix.¹¹⁴ As if five trillion dollars in daily transactions were not enough incorporation of the benchmarks, they are indirectly hardwired into many other benchmarks. For example, the Dow Jones Industrial Average, S&P 500, FTSE 100, and others equity indices all use the WM/Reuters benchmarks to compute the value of stocks denominated in foreign currency.¹¹⁵ It is only a slight exaggeration to say that the leading currency benchmarks co-determine almost all derivative prices.

Investment funds, through which Americans save for retirement, hardwire currency benchmarks as well. Foreign investments are valued using the leading benchmarks for the purpose of computing the fund’s Net Asset Value. This value is then used to determine how much a mutual fund investor receives when selling back her shares. If this number is inaccurate, the fund could pay out more than the investor’s pro-rata share, thus violating the law and risking the stability of the fund.

Widespread hardwiring gives trading banks an incentive to influence the benchmarks. If they place a bet on currency movements with a financial derivative, or commit to buy or sell currency in the future, the level of the benchmark determines whether they are a winner or loser. Recent manipulative allegations concern spot trades with customers: the customer would contract to buy currency, with the price to be equal to the 4 p.m. London Fix.¹¹⁶ If traders could temporarily change the benchmark at that time, they could covertly overcharge their customers. But arguably greater opportunity exists in exploiting the currency derivatives market, which is even larger than the spot market.¹¹⁷ Large banks act as dealers of hedging transactions for big companies or speculative bets for investment funds. Winning such bets is a tempting prize for the successful manipulator.

¹¹³ *Triennial Central Bank Survey: Foreign Exchange Turnover in April 2013: Preliminary Global Results*, BANK FOR INT’L SETTLEMENTS 9 (Sept. 2013) [hereinafter *Foreign Exchange Turnover*], <http://www.bis.org/publ/rpfx13fx.pdf>, archived at <https://perma.cc/SA7E-3U8P?type=pdf>.

¹¹⁴ *Id.*

¹¹⁵ See *Spot & Forward Rates Guide*, *supra* note 108, at 10; see also *Dow Jones Averages Methodology*, S&P DOW JONES INDICES 13 (Aug. 2013), https://www.djindexes.com/mdsidx/downloads/meth_info/Dow_Jones_Industrial_Average_Methodology.pdf, archived at <https://perma.cc/2L22-C85F?type=pdf> (referencing DJIA’s use of WM/Reuters).

¹¹⁶ Vaughan et al., *supra* note 31. There do not appear to have been significant controls prohibiting intra-firm communication about customer orders and the firm’s own positions. This is not a recent phenomenon. See G.C. Morris, *The Role of the Foreign Exchange Department*, in *MANAGING A FOREIGN EXCHANGE DEPARTMENT: A MANUAL OF EFFECTIVE PRACTICES 2–3*, 5 (Rudi Weisweiler ed., 1985) (describing casual intra-firm communication).

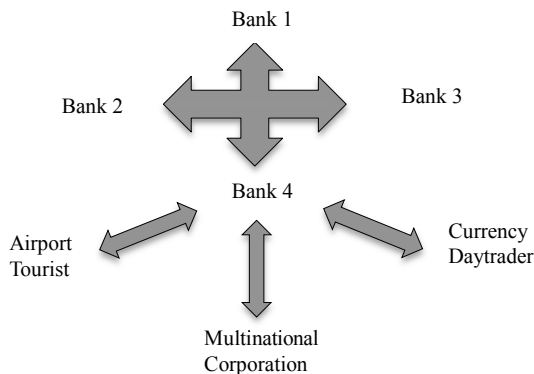
¹¹⁷ *Foreign Exchange Turnover*, *supra* note 113, at 13.

2. Susceptibility

These leading benchmarks are susceptible to manipulation. Despite the vast size of the currency market, the slice incorporated by the leading benchmarks is small and by no means representative. More importantly, strategic considerations can and do influence which data the benchmark actually incorporates.

While leading benchmarks seeks to represent the market price for currency, numerous factors constrain the representativeness of the benchmark. Benchmark price is compiled from trades on Reuters's platform, with limited recourse to other data.¹¹⁸ This venue captures some, but not all, of the trades between a dozen large banks (the "interdealer market") and little else.

Difficulties arise in part from the result of the structure of the currency market. This is not a market where many traders meet at a central and open exchange to directly trade on equal terms. Instead, "[t]he foreign exchange market in which the transactions occur is a decentralized or over-the-counter market, which means there is no central location for buyers and sellers of currencies to do business."¹¹⁹ Further, the currency market is a "two-tiered" market in which most parties trade with one of a few big banks, and those banks trade with one another on very different terms and for very different reasons. A stylized depiction of the market structure appears below. The intersection of the four banks is the interbank market (which sometimes called the wholesale market). Each bank also has a network of customers, just like Bank 4 does, which collectively constitutes the retail market. Banks tend to net these trades against one another, coming to the interbank tier in order to trade away any imbalances that nevertheless occur.



¹¹⁸ *Spot & Forward Rates Guide*, *supra* note 108, at 3.

¹¹⁹ *La. Mun. Police Employees' Ret. Sys. v. JPMorgan Chase*, No. 12 Civ. 6659, 2013 WL 3357173, at *10 (S.D.N.Y. July 3, 2013).

The interbank tier is essentially an invitation only market.¹²⁰ Many users, such as multinational corporations, money managers, and ordinary individuals—who collectively make up almost a sixth of all currency trading volume—are essentially absent.¹²¹ A large minimum volume, typically five million dollars, is necessary to trade.¹²² Therefore, there are limits to the entry of new traders who might reduce the relative influence of the incumbent banks. The result is striking: the top four banks conduct 50.4% of customer volume.¹²³ In the spot market (market for immediate delivery), ninety-eight percent of market share goes to ten firms.¹²⁴ Crucially, only transactions in this interdealer market count in determining currency benchmarks.

It might be of little concern that the benchmark rate is deduced from only the trades of a few big banks if it were at least drawing from a representative slice of their trades. In reality, however, banks can control where they trade.¹²⁵ They are free to direct trades to electronic brokerages other than the Reuters platform, or to pick up the telephone and trade without any electronic system. And they frequently avail themselves of this freedom.¹²⁶

¹²⁰ Although much of the market has become anonymous and electronic, the electronic systems still allow parties to designate which counterparties they trust. Only quotes from those parties are displayed on the screen.

¹²¹ CHEOL EUN & BRUCE RESNICK, *INTERNATIONAL FINANCIAL MANAGEMENT* 116 (6th ed. 2007).

¹²² See ATKIN, *supra* note 109, at 159.

¹²³ Peter Lee, *FX Survey 2013: Deutsche Clings on Despite Citi's Resurgence*, EUROMONEY (May 2013), <http://www.euromoney.com/Article/3200845/FX-survey-2013-Deutsche-clings-on-despite-Citis-resurgence.html>, archived at <http://perma.cc/UUD3-VXLP>.

¹²⁴ *The Foreign Exchange and Interest Rate Derivatives Markets: Turnover in the United States* FED. RESERVE BANK OF N.Y. 6 (Apr. 2013), <http://www.newyorkfed.org/markets/pdf/2013triennialreport.pdf>, archived at <http://perma.cc/B7AS-GEXF>.

¹²⁵ Numerous non-manipulative purposes might lead a bank to trade away from the Reuters platform. Trades through a bank's proprietary electronic trading platform may permit the bank a superior execution price. Banks may also prefer to avoid bringing large trades to the Reuters platform in order to avoid giving valuable information to rival traders. They may also be concerned for counterparty risk—the chance that the other party becomes unable to honor their bargain because they have become insolvent. Trading through Reuters is anonymous. That may be fine for transactions under thirty million dollars, but for larger sums, it can prove important to make sure that one's trading partner is trustworthy enough to perform (and be in business) when it comes time to actually tender the currency. ATKIN, *supra* note 109, at 175.

¹²⁶ *High-Frequency Trading in the Foreign Exchange Market*, BANK FOR INT'L SETTLEMENTS 9 (Sept. 2011), <http://www.bis.org/publ/mkte05.pdf>, archived at <https://perma.cc/FK2Q-4R2H?type=pdf> (“They can evade detection . . . by executing large flows in less transparent venues, including reverting to transacting bilaterally over the telephone.”); *In re Citibank, N.A.*, CFTC No. 15-03 (Nov., 11, 2014), <http://www.cftc.gov/ucm/groups/public/@lrenforcementactions/documents/legalpleading/enfcitibankorder111114.pdf>, archived at <http://perma.cc/V7NG-6E22> (banks strategically offset some position outside of the polled window and venue).

As a result, only one sixth of trades by big banks end up on the electronic platforms that inform the benchmark price.¹²⁷ And their big trades make up less than half of the total trading volume.¹²⁸ The rest is settled in other venues, to which the benchmark is blind. Therefore the benchmark rates are being assembled from far less than ten percent of the applicable market.

Incorporated trades are also temporally circumscribed. Only trades made during *designated periods* are combined and reported as the rate. The period may be a one or two minute window per hour or half hour.¹²⁹ Thus, the world's most important currency rates are determined without reference to ninety-seven percent of the day's trading time.¹³⁰ A trader who concentrates her trading within this short window stands a good chance of influencing the price for the next half hour—which may be an important half hour for the purpose of some hardwired use of the benchmark.¹³¹

There are few markets in the world with such concentrated participation in the benchmark, but some of these trends are relatively recent. Rapid consolidation in the financial services sector has led to unprecedented concentration in the currency trading business.¹³² Sophisticated and deliberate efforts to offset customer trades means that banks can now net out a large portion of their customer trades against one another, limiting the number of trades that they

¹²⁷ Rime & Schrimpf, *supra* note 2, at 36.

¹²⁸ *Id.* at 29 (thirty-nine percent in 2013, down from sixty-three percent in the late 1990s).

¹²⁹ *Spot & Forward Rates Guide*, *supra* note 108, at 3.

¹³⁰ These tend to be periods of high trading volume, in part because traders perceive greater safety in trading alongside others. *Foreign Exchange Benchmarks*, *supra* note 107, at 17. Likewise, hardwiring benchmark users select the 4 p.m. fix because they perceive it to be safer, and the benchmark providers provide a 4 p.m. fix (rather than, say, a 3:45 p.m. fix) because they are trying to reach a period of concentrated trading. The status quo involves many actors trying to reduce risk and increase accuracy. Still, they are only able to improve things so much without appropriate regulatory assistance. There is no assurance that these trades will be a majority of the hour's transactions, nor that they will be representative of the prior and following trades.

¹³¹ Catherine Boyle, *Forex Manipulation: How It Worked*, CNBC (Mar. 11, 2014), <http://www.cnn.com/id/101482959>, archived at <http://perma.cc/MVK9-9VXT> (customer exploiting trades made in the last minutes before 4 p.m.). Note, however, that price impacts may well last longer than a few minutes. On lingering price impacts, see David Berger et al., *Order Flow and Exchange Rate Dynamics in Electronic Brokerage System Data*, 75 J. INT'L ECON. 93, 108 (2008) (stating that the price impact can last up to two weeks); Martin Evans & Richard Lyons, *Do Currency Markets Absorb News Quickly?*, 24 J. INT'L MONEY & FIN. 197, 214–16 (2005) (stating the price impact lingers for several days).

¹³² See, e.g., Katie Martin, *Deutsche Bank Wins Euromoney FX Poll*, WALL ST. J., May 8, 2013, <http://online.wsj.com/news/articles/SB10001424127887324244304578471422221191246>, archived at <https://perma.cc/3S2A-U5LS?type=pdf> (describing competition in becoming the world's biggest currency dealing bank).

must offset in the interdealer market.¹³³ Widespread benchmark dependence emerged at a time before trading became so concentrated.¹³⁴

Enormous volumes of customer order flow allow the dealer banks discretion in how to deploy those trades. A bank receiving a large buy order from a customer might immediately recognize it through a trade in the interdealer market, or quietly trade it off to a hedge fund on similar terms,¹³⁵ or (quieter still) just keep the trade on its own books.¹³⁶ Acting as a broker or a dealer, the intermediary's access to other people's money gives it countless free options to decide whether the benchmark moves or stands still.

Arbitrage possibilities are inhibited because of the interbank market's exclusivity as well as the market's opacity. There is no single price for a given currency.¹³⁷ Instead, prices depend on volume, trader identity, trade venue, and other factors. Although Reuters makes substantial quantities of data widely available, the best and fastest data streams are only available to paying subscribers.¹³⁸ As explained in a spate of recent lawsuits by pension funds charged baffling sums for trades, it is practically impossible for most market participants to discover how well their trades have been executed.¹³⁹ Of equal im-

¹³³ *International Banking and Financial Market Developments*, BANK FOR INT'L SETTLEMENTS Q. REV., Dec. 2013, at 39 n.2 (stating that in major currency trades, such as USD to Euro, the internalization rate may exceed seventy-five percent).

¹³⁴ Although access and competition have grown in the FX market, the essential market structure remains two-tiered. Nowadays, large customers can purchase the right to trade in the interdealer market through a "prime brokerage" agreement, in which they trade in the name of a well-established bank. For other customers, an increasing number of platforms exist to receive dealer quotes without consulting the interdealer market. Importantly, though these trends each deemphasize the principal banks' importance *in the interdealer market*, these changes have nevertheless emphasized banks' importance to the market *as a whole*. This is because non-bank access to the interdealer market has largely occurred *through* the traditional banks.

¹³⁵ Carol Osler et al., *Price Discovery in Currency Markets*, 30 J. INT'L MONEY & FIN. 1696, 1697 (2005) (suggesting banks offer informed financial customers narrower spreads).

¹³⁶ Frank McGroarty et al., *Microstructure Effects, Volatility in the Spot Foreign Exchange Market Pre and Post-EMU*, 17 GLOBAL FIN. J. 23, 28–29 (2006) ("Transactions between FX banks and their customers are bilateral and are not visible to other banks. So, the other banks cannot use the buy/sell information of this trade to update their prices.").

¹³⁷ *La. Mun. Police Employees' Ret. Sys.*, 2013 WL 3357173, at *10.

¹³⁸ On the impact of these terminals, see ATKIN, *supra* note 109, at 149, 151.

¹³⁹ See *La. Mun. Police Employees' Ret. Sys.*, 2013 WL 3357173, at *10–11; *Stationary Engineers Local 39 Pension Trust Fund v. Bank of New York*, No. C 11-03620, 2012 WL 476526, at *1–2 (N.D. Cal. Feb. 14, 2012). As is typical, the banks promised their clients "No Transaction Fees . . . [for] custody and accounting [services]." *La. Mun. Police Employees' Ret. Sys.*, 2013 WL 3357173, at *7. Yet, those same contracts often specify that the bank can execute currency transactions within a certain price range without getting a client's approval in a given transaction. *Id.* at *7–8. In practice, banks set the price of the currency at whatever market price was least advantageous to the client that day. *Id.* at *3. The results of this maximally-costly-approach—the prices themselves—are disclosed in post-trade reports that often come weeks after the transaction and do not list the times at which the trade was executed, and that provide little basis by which to determine the implicit profits made by the bank. *Stationary Engineers Local 39 Pension Trust Fund*, 2012 WL 476526, at *2. Therefore, no ex

portance, a substantial delay—often about 15 minutes—separates the end of the applicable benchmarking period and the revelation of the computed value.¹⁴⁰ Large traders know how their own trades may have influenced the coming price, thereby gaining a structural head start on the market and would-be arbitrageurs,¹⁴¹ one of the many informational advantages that give connected banks demonstrably better trading profits than outsiders.¹⁴²

Manipulation in currency takes place despite an almost entirely “objective” benchmark. The benchmark essentially draws only from real transactions, and as many as the benchmark provider can observe. The provider exercises very little subjectivity or discretion at any stage. The problems in the market need not be created by the fibs of data providers or the venality of those close to the benchmark. Instead, manipulation can occur as result of the structure of the sampling process itself, which counts some trades but excludes other economically identical ones. The ability to strategically feed or starve the transactional benchmark of transactional data gives transactors outsized influence.¹⁴³

ante discussion of the price may take place and no *ex post* evaluation may be possible. The result is that custodial currency transactions often cost much more than what similar transactions cost other retail customers, which is itself still much greater than the wholesale rate. Compare Osler et al., *supra* note 135, at 1700 (stating that the half-spread customer rate was 9.2 basis points, much higher than the 1.6 basis points for interdealer trades), with Carol Osler et al., *Asymmetric Information and the Foreign Exchange Trades of Global Custody Banks* 8 (Nov. 2012) (Brandeis Univ., Working Paper No. 55, 2012), available at http://www.brandeis.edu/departments/economics/RePEc/brd/doc/Brandeis_WP55.pdf, archived at <http://perma.cc/AMJ7-EAQU> (stating that the bid-ask spread on non-OTC transaction exceeds 40 basis points). An entire industry of transaction cost-analyses has emerged to report on the quality of execution for currency transactions. See, e.g., FXTRANSPARENCY.COM, <http://www.fxtransparency.com/>, archived at <http://perma.cc/RZ7U-RPSM> (last visited Dec. 29, 2014). There appears to be a trend in clients pushing for lower costs. Christopher Condon, *SEC Investigates State Street Over Foreign-Exchange Pricing After Lawsuits*, BLOOMBERG NEWS (May 12, 2011), <http://www.bloomberg.com/news/2011-05-12/sec-probes-state-street-foreign-exchange-pricing.html>, archived at <https://perma.cc/R2B5-6PZ2?type=image> (“Increased scrutiny could force custody banks to lower their fees for the service regardless of the legal outcomes”); *FX Transparency Releases Study on Standing-Instruction Currency Trading Costs*, FXTRANSPARENCY.COM, (Mar. 1, 2011), <http://www.fxtransparency.com/category/press/>, archived at <http://perma.cc/L767-4WRF>.

¹⁴⁰ *Spot & Forward Rates Guide*, *supra* note 108, at 2.

¹⁴¹ Bettina Peirs, *Informed Traders, Intervention, and Price Leadership: A Deeper View of the Microstructure of the Foreign Exchange Market*, 52 J. FIN. 1589, 1612 (1997) (stating that the Deutsche Bank is able to anticipate major currency price changes by 60 minutes).

¹⁴² Lukas Menkhoff et al., *Information Flows in Dark Markets: Dissecting Customer Currency Trades* 30–31 (Bank for Int’l Settlements, Working Paper No. 405, Mar. 2013), available at <http://www.bis.org/publ/work405.pdf>, archived at <https://perma.cc/6QAK-DXQU?type=pdf>.

¹⁴³ See *supra* notes 55–96 and accompanying text; *infra* notes 203–298 and accompanying text.

B. Crude Oil

The crude oil market is massive (at least five trillion dollars), but the economics understates its importance.¹⁴⁴ It is one of the few commodities for which nations do not hesitate to fight wars, and its pricing at the pump is a regressive and salient cost for low-income Americans. Given its size and importance, one might imagine that it is relatively difficult to engage in traditional price manipulation.

Yet it is also fundamentally dependent upon a few price benchmarks. Crude oil is mostly traded bilaterally, over-the-counter in an opaque market.¹⁴⁵ Price reporting agencies, such as Platts and Argus, have gathered and sold transactional data relating to the various grades of crude oil, for delivery to various locations, for more than 100 years.¹⁴⁶ Their benchmarks have also been the instrumentality of pervasive manipulation.¹⁴⁷

1. Hardwiring

Few markets show as much hardwiring of contracts as crude oil. As with all industries, long term and derivative contracts tend to cite a market rate.¹⁴⁸ But even spot-contracts, the sort of contract that we normally think of as unlikely to use a benchmark, make extensive use of them.¹⁴⁹ Several factors drive extensive benchmark use. First, because oil must be shipped over vast distances, even contracts for present delivery necessarily take place in the future. Whenever there is timing risk, parties may wish to adjust for market changes. Second, many sellers are oil producing countries who do not wish to emphasize the degree to which they influence oil prices. By incorporating a price benchmark, they appear to defer to market forces. Third, historical legacies served to establish norms that may remain for all the reasons that widespread

¹⁴⁴ *Global Oil & Gas Exploration & Production: Market Research Report*, IBIS WORLD (Feb. 2014), <http://www.ibisworld.com/industry/global/global-oil-gas-exploration-production.html>, archived at <http://perma.cc/2SWF-X2MX>.

¹⁴⁵ *Putting a Price on Energy: International Price Mechanisms for Oil & Gas*, ENERGY CHARTER SECRETARIAT 79–80 (Mar. 1, 2007), http://www.encharter.org/fileadmin/user_upload/document/Oil_and_Gas_Pricing_2007_ENG.pdf, archived at <http://perma.cc/XX4E-6H96>.

¹⁴⁶ *History*, PLATTS, <http://www.platts.com/history>, archived at <https://perma.cc/EVP4-CVQV>?type=source (last visited Dec. 29, 2014) (stating that Warren Platt started his publishing venture in 1909).

¹⁴⁷ See *infra* notes 172–176, 231–243 and accompanying text; see also Ajay Makan et al., *supra* note 7 (describing an investigation by European authorities into illegal price manipulation of industry benchmarks by major oil companies).

¹⁴⁸ Fattouh, *supra* note 96, at 7 (“Price agreements are usually concluded on the method of formula pricing that links the price of a cargo in long-term contracts to a market (spot) price. Formula pricing has become the basis of the oil pricing system.”); see, e.g., 3A MUNICIPAL LEGAL FORMS § 67:13 (West ed., 2014) (using Platts index in escalator clause).

¹⁴⁹ Fattouh, *supra* note 96, at 24.

practices remain. For most of history, the majority of crude oil producers have not even attempted to sell (or report selling) at a “market” price. Producer prices were often purely notional, serving mostly to allocate tax revenues between producer country and consumer country.¹⁵⁰ It should be little surprise that pricing systems developed to work with, or around, such price data may not always flawlessly represent the increasingly “real” pricing of oil.

2. Susceptibility

Crude oil generally, and certain grades in particular, exhibit ample concentration and voluntariness. Only the last thirty minutes of trading actually influences the leading benchmark price.¹⁵¹ Trades at lunchtime, no matter how momentous, simply do not count. As a result, the Platts’s methodology captures less than three percent of the total trades.¹⁵² This is a concentrated domain, and one that is amenable to strategic behavior because these trades are only *eligible* for inclusion. To be actually included, a trader must voluntarily report the trade to Platts.¹⁵³

If neither trader reports the trade, it will not be included in the benchmark.¹⁵⁴ As one expert commentator notes,

Platts has no power to force any company to reveal all the deals it does. Companies can therefore cherry pick which deals to show to in the Platts window and which to exclude. There is no sanction against showing only one half of a non-arm’s length transaction.¹⁵⁵

Thus, parties have substantial strategic control over the data they bring to Platts’ attention and the data that goes unreported.¹⁵⁶ Strategic submissions are one reason that less than ten percent of the most relevant trades are incorpo-

¹⁵⁰ See *Putting a Price on Energy: International Price Mechanisms for Oil & Gas*, *supra* note 145, at 76–77.

¹⁵¹ See INT’L ORG. OF SEC. COMM’NS ET AL., *supra* note 96, at 13; *European Oil Products: Editorial Guidelines and Methodologies*, PLATTS 2–3 (Feb. 2011), <http://www.platts.com/IM.Platts.Content/MethodologyReferences/MethodologySpecs/europeanoilproductspecsguideline.pdf>, archived at <https://perma.cc/3UDR-CJMM?type=pdf>.

¹⁵² Fattouh, *supra* note 96, at 32 (finding that the volume of spot market trades accounted for in the Platts window constituted only 2.3% of the total volume of trades).

¹⁵³ BD. OF THE INT’L ORG. OF SEC. COMM’NS, *supra* note 68, at 29.

¹⁵⁴ Whole categories of sellers never report their trades, leaving many buyers the unilateral power to report or suppress the data. See Liz Bossley, *Motive, Means, and Opportunity*, 94 OXFORD ENERGY F. J. 1, 8 (Nov. 2013), available at <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/01/OEF-94.pdf>, archived at <https://perma.cc/X6PV-CJSC?type=pdf>.

¹⁵⁵ *Id.*

¹⁵⁶ Platts also interviews traders and engages in independent research, which can supplement the observed transactional data. However the push for electronic submission and objective methodology has reduced the emphasis of this function.

rated into the Platts benchmark price, a fact that has led to criticism in some quarters.¹⁵⁷ Strategic submission, such as reporting only trades above (or below) the prevailing market price, while suppressing other trades, could obviously bias the benchmark.

These benchmarks are plagued by ever-increasing concentration and illiquidity. Consider Dubai crude oil, which is perhaps the third most important grade in the world for benchmarking purposes. Essentially all oil sales to Asia are priced from Dubai. But its importance exceeds its robustness. There is very little Dubai crude drilled, pumped, or sold on planet Earth any longer.¹⁵⁸ At the present, half of trading days see literally no trading in Dubai crude in the principal venue that informs the benchmark price. The minimum trading volume in that venue is just twenty-five thousand barrels.¹⁵⁹ At current market prices (roughly one hundred dollars per barrel), that means that for less than three million dollars, one could be the only trader in Dubai and thereby choose the price of oil shipped to Asia for a day.¹⁶⁰ Of those trades that do occur, just three traders might make up *all* trading in a given *month*, demonstrating substantial participant concentration.¹⁶¹ This remains a surprisingly small, illiquid, and concentrated market, given the size of the global crude trade.¹⁶²

The possibility for arbitrage to correct distorted pricing is limited in many ways.¹⁶³ The market is opaque and anything but standardized, as bilateral trades of different grades face different shipment costs around the world. Oil is expensive to store, and it is practically challenging to arrange shipping to take

¹⁵⁷ Fattouh, *supra* note 96, at 31–33.

¹⁵⁸ *Id.* at 61–69. The most recent estimates suggest that Dubai's production has fallen to less than 60,000 barrels per day. *Id.* at 61. Meanwhile, about 13.1 million barrels per day are exported from the Gulf to Asia. *Id.*

¹⁵⁹ Bassam Fattouh, *The Dubai Benchmark and Its Role in the International Oil Pricing System*, OXFORD INST. FOR ENERGY STUD., Mar. 2012, at 2, available at <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/03/The-Dubai-Benchmark-and-its-Role-in-the-International-Pricing-System.pdf>, archived at <http://perma.cc/ZJ2Q-LG25>.

¹⁶⁰ The spot market itself has less than one trade per week, on average. *Id.* at 3.

¹⁶¹ Fattouh, *supra* note 96, at 28.

¹⁶² *Id.* Things are only slightly less concentrated for West Texas Intermediate, the most important grade for American producers and consumers. A typical day might see a dozen spot trades, which is far more than Dubai, but still worrying, considering that top three sellers make up fifty-one percent of sales and thirty-eight percent of the top three buyers. *Id.* Compare this to the lower concentration in Brent, the most important of the three chief benchmarks. Nearly twenty companies pump contributing into the system, and none of them accounts for more than a quarter of production. LIZ BOSSLEY, BRENT: A USER'S GUIDE TO THE FUTURE OF THE WORLD PRICE MARKER 83 (2007). See generally PAUL HORSNELL & ROBERT MABRO, OIL MARKETS AND PRICES: THE BRENT MARKET AND THE FORMATION OF WORLD OIL PRICES 75–77 (1993).

¹⁶³ Adrian Binks, *Middle East Crude Oil Pricing: The Dubai Debate*, 48 MIDDLE E. ECON. SURV. 27, 30 (2005).

delivery.¹⁶⁴ It is a daunting task for an observant speculator to correct biased benchmark prices.¹⁶⁵

Many of these vulnerabilities, and the continued use of the benchmark notwithstanding them, reflect unaddressed historical legacies. Dubai crude was once a plentiful asset,¹⁶⁶ meaning that trust was better justified. Oil prices were once generated primarily for taxation purposes, not commercial ones, meaning that trust was once less expected. And widespread public hardwiring creates strong network effects for market participants to remain with the same benchmarks. It is not unprecedented for these changes to go unaddressed for some time: the benchmark for one grade of oil, Alaska North Slope (“ANS”), traded for years after the wells effectively went dry,¹⁶⁷—an example of essentially hypothetical trading.¹⁶⁸

Price reporting agencies are conscious of the risk that changing circumstances will render their reports vulnerable or, worse yet, obsolete. They therefore update their key benchmarks from time to time, altering their methodology to decrease concentration and increase robustness.¹⁶⁹ Even when things change, though, they may not change in ways that are better in all respects. Platts’s current window structure, which privileges certain trades made during a thirty-minute period, and which many believe facilitates manipulation, was only introduced in 2002, well after Platts’s benchmarks achieved their nested dominance.¹⁷⁰ This new Platts system renders the price reporting system more transparent and objective than under the previous reporting system, which rested to a greater degree on editors’ subjective judgments. In so doing, however, the new system prioritizes the influence of the traders best positioned to exploit it.

Given all these markers of benchmark vulnerability, it may be no surprise that governments¹⁷¹ and class action plaintiffs allege manipulation in the crude oil market.¹⁷² This would not be the first time that price reporting agencies

¹⁶⁴ See PLATTS, *supra* note 146, at 4 (“Terms of trade such as quality, delivery port, timing of delivery/loading and price are fully up to the company issuing the bid or offer.”).

¹⁶⁵ See Fattouh, *supra* note 96, at 12.

¹⁶⁶ Binks, *supra* note 163, at 27–28. There have been efforts to improve the liquidity of Dubai crude, by grouping it with grades that might have otherwise traded separately. *Id.* at 28–29.

¹⁶⁷ See, e.g., BP Oil Supply Co. v. United States, 36 I.T.R.D. (BNA) 314, 314 (Ct. Int’l Trade 2014) (discussing issues arising out of the exportation of ANS); Tesoro Alaska Co. v. Union Oil Co., 305 P.3d 329, 330–31 (Alaska 2013) (using the ANS benchmark in contract setting).

¹⁶⁸ See Fattouh, *supra* note 96, at 70.

¹⁶⁹ Rauterberg & Verstein, *supra* note 56, at 122 (describing update to Brent index).

¹⁷⁰ Peter Stewart, *Hard Truths About Market Transparency*, 94 OXFORD ENERGY F.J. 4, 5–6 (2013), <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/01/OEF-94.pdf>, archived at <http://perma.cc/3RAH-DXS2>.

¹⁷¹ Justin Sheck & Jenny Gross, *supra* note 6.

¹⁷² E.g., *In re Crude Oil Commodity Futures Litig.*, 913 F. Supp. 2d 41, 49–50 (S.D.N.Y. 2012).

played a role—witting or unwitting—in distorting real prices in the crude oil market. In 1940, in *United States v. Socony-Vacuum Oil Co.*, the U.S. Supreme Court delivered a landmark decision.¹⁷³ The case, which established the anti-trust principle of per se illegality, involved serious allegations that Platts and its peers “were the instrumentalities by which the artificial spot market prices were converted into wholesale prices.”¹⁷⁴ In a word, they were hardwired into contracts in those days too.¹⁷⁵

C. Equities

Are equity markets—trading in the shares of stock of major corporations—vulnerable to the same sort of benchmark manipulation? The answer will depend on just what is considered a “benchmark.”¹⁷⁶ By any account, equities are generally less susceptible to benchmark manipulation than other markets and their benchmarks, but they are far more susceptible than commonly expected. This Section shows that equity markets utilize, and hardwire, benchmarks far more widely than is commonly known and that a majority of equity market manipulations may be benchmark manipulations.

One type of benchmark in the equities market is a broad stock index, such as the S&P 500. Stock indices arguably seek to represent two different underlying markets. First, they seek to capture some broad segment of market activity. For the S&P 500, that might be the value of America’s large companies. By focusing on just 500 firms, the index allows inferences about the rest.

Second, the S&P 500 also seeks to represent the prices of those very 500 companies on the list. It is proper to say “represents” because the index is not self-executing or fully transparent to the market for those 500 stocks. The S&P indices committee designs a methodology for constructing an index value from

¹⁷³ 310 U.S. 150, 165–66 (1940).

¹⁷⁴ Brief for the Petitioners at 141, *Socony-Vacuum Oil Co.*, 310 U.S. 150 (Nos. 346, 347) 1940 WL 47028, at *141.

¹⁷⁵ *Id.* at 5–6 (stating that major market participants, that sold eighty-five percent of the gasoline in the region, used contracts with a hardwired benchmark price).

¹⁷⁶ Equity indices are commonly distinguished from benchmarks of various sorts. *See, e.g.*, Barbara Novick et al., *Best Practices for Better Benchmarks: Recommendations for Financial Benchmark Reform*, BLACKROCK, Mar. 2013, at 2, available at <https://www.blackrock.com/corporate/en-us/literature/whitepaper/recommendations-for-financial-benchmark-reform.pdf>, archived at <https://perma.cc/RNA4-LFQB?type=pdf>. This Article has deliberately avoided defining or distinguishing benchmarks and indices, using them interchangeably, because of the variety of different convention associated with them. Sometimes the distinction reflects assets: it is common to refer to commodity benchmarks and equity indices. Sometimes, terminology denotes the degree of hardwiring: benchmarks are hardwired, indices are not. Given the various senses in common usage, that it makes little sense to privilege one in a paper designed to illuminate each phenomenon. In any case, as this section demonstrates, differences in economic substance between equity indices and other benchmarks are of degree rather than of kind.

a subset of available and ambiguous data. For example, declines of a company's stock price should generally lower the S&P, but not if the decline is due to a stock split or some other nominal activity. Likewise, increasing the number of shares of a company—if the per-share price remains constant—should represent an increase in the company's value to the index. But, such is not the case if the increase is lodged solely in the company's treasury or in a control group. S&P must craft and apply policies to ambiguous acts.¹⁷⁷

Just like any benchmark, the S&P 500 represents a non-obvious set of data, which is combined in a non-obvious fashion, to compute an index value. And, in the end, it is the “official” S&P calculation of the index value, and not the value computed by stock exchanges, funds or anyone else, that acts as the settlement price of financial derivatives.¹⁷⁸

If the S&P 500 can be a benchmark of those 500 stocks, could an “S&P 1” exist that would represent—authoritatively, for contracts that hardwired a reference—the price of a single stock? Indeed. Such narrow benchmarks are terrifically important, and are the locus of substantial equity market manipulation.

The most important narrow benchmark is the end of day or closing price on a stock exchange. It may seem that the closing price is a brute fact—simply whatever price the stock most recently traded for—but that is not quite right. Closing prices are conjured subject to elaborate rules (often designed to reduce manipulative potential), and often differ considerably from the calculation of price throughout the day. In some cases, closing prices are calculated by aggregating the trading prices for some number of minutes leading up to the end of the day.¹⁷⁹ Others contrive auctions intended to maximize the amount of tradable stock.¹⁸⁰ Other markets select a random moment in time *prior* to closing to represent the closing price.¹⁸¹ In each case, manipulation is a temptation

¹⁷⁷ S&P must also monitor for changes. It is possible that S&P will exclude changes pending verification of data for a longer or shorter period than market participants themselves would, thereby excluding some transactions from the calculation. *S&P Dow Jones Indices Corporate Actions: Policies & Practices*, S&P DOW JONES 31–32 (Jul. 2012), https://www.djindexes.com/mdsidx/downloads/client_services/methodology-sp-corporate-actions-policies-practices.pdf, archived at <https://perma.cc/Z2S5-HCPR>.

¹⁷⁸ *Mini-SPX Index Options—XSP: Contract Specifications for XSP*, CBOE, <https://www.cboe.com/micro/xsp/specifications.aspx>, archived at <https://perma.cc/25SQ-X3HN> (last visited Dec. 29, 2014) (“The exercise settlement value, XSP, is one-tenth (1/10th) the official closing price of the S&P 500 Index as reported by Standard & Poor’s on the last trading day of the expiring series.”).

¹⁷⁹ The Hong Kong Stock Exchange averages the median price, gathered every fifteen seconds leading up to close. *Closing Price Calculation*, H.K. STOCK EXCH., http://www.hkex.com.hk/eng/market/sec_tradinfo/Documents/closepricecal.pdf, archived at <http://perma.cc/V63J-K3TF> (last updated Mar. 23, 2009).

¹⁸⁰ See *Closing Auctions*, N.Y. STOCK EXCH. (2014), <http://www.nyse.com/equities/nysearc/aquities/1157623605155.html>, archived at <http://perma.cc/JSQ7-NZD6>.

¹⁸¹ LARRY HARRIS, *TRADING AND EXCHANGES* 136 (2003).

because traders need only trade or make offers of a certain type, at a certain time, in order to influence the publicly recognized proxy for price.¹⁸²

All exchanges reserve for themselves the ability to undo or modify closing prices under suspicious circumstances, making the persistence of the closing price a product of the exchange's discretion.¹⁸³ To be sure, exchanges only rarely edit prices for having been erroneous or fraudulent. But they may do so in some of the most dramatic moments, underscoring the difference between the "official" price and actual transactional prices in order to achieve justice and restore credibility. There is a lesson to be learned from the infamous "flash crash" of 2010, in which the Dow Jones Industrial Average lost almost ten percent of its value in minutes, and then fully recovered a few minutes later.¹⁸⁴ The New York Stock Exchange subsequently cancelled all trades on some securities—and no trades for others—amending the official history of prices to exclude transactions made in that window.¹⁸⁵

Unlike exchange closing prices, which do not incorporate trades executed off of the exchange, other venues may sometimes trade at meaningfully different prices because exchanges adopt rules for categorically excluding certain kinds of trades. For example, New York Stock Exchange rules prevent the execution of a short sale far below the otherwise prevailing price.¹⁸⁶ If a large short sale took place over-the-counter near the end of the day, the closing price of the NYSE price of the stock would appear to be much higher than the most recent genuine transaction. There is nothing wrong with excluding off-exchange data, nor having rules about what sorts of trades are acceptable on the exchange. Each of these rules may be intended to improve the quality of the closing price. Yet each one is an editorial choice. Rules and interventions non-trivially modify the representation to make it non-self-executing, dependent upon the exchange *qua* benchmark provider, and subject to this Article's benchmark analysis.

Stock indices and closing prices are extremely important to the market. They are hardwired into all kinds of legal relationships, which leads to the

¹⁸² Jonathan Guthrie, *Compliance Training Cannot Save Forex from Red Tape*, FIN. TIMES, July 4, 2014, <http://www.ft.com/intl/cms/s/0/5f4d5c46-02a0-11e4-a68d-00144feab7de.html#axzz3JutCaz5G>, archived at <https://perma.cc/55TX-EHBJ?type=pdf> (discussing manipulation of closing prices as "an open secret").

¹⁸³ NYSE Rule 128, N.Y.S.E. Guide (CCH) ¶ 2128 (2008).

¹⁸⁴ Tom Lauricella, *Market Plunge Baffles Wall Street: Trading Glitch Suspected in 'Mayhem' as Dow Falls Nearly 1,000, Then Bounces*, WALL ST. J., May 7, 2010, at A1.

¹⁸⁵ *Final Update: CEE Review Determination for Multiple Symbols*, N.Y. STOCK EXCH. (Aug. 1, 2012), <http://markets.nyx.com/nyse/trader-updates/view/11183>, archived at <http://perma.cc/N73M-52FE>.

¹⁸⁶ NYSE Rule 440B, N.Y.S.E. Guide (CCH) ¶ 2440B (2008).

temptation to manipulate.¹⁸⁷ The S&P 500 is the settlement value for some of the world's most traded financial derivatives,¹⁸⁸ as well as the blueprint for perhaps one trillion dollars worth of investment funds.¹⁸⁹ Hundreds of thousands of other equity indices serve similar purposes elsewhere.¹⁹⁰

Closing prices are a common settlement value for financial derivatives based on single equities, such as stock options.¹⁹¹ Mutual funds are legally obliged to pay investors their pro rata share of the Net Asset Value of the fund; that is an owner of one percent of the fund should get one percent of its value when she sells. Funds calculate Net Asset Value using the closing prices of their assets.¹⁹² Even other markets rely on one another's closing prices.¹⁹³

Margin requirements for traders are computed based upon the closing price of stocks they hold—if closing prices go down, they could face a margin call. The requirement to put more cash in the exchange or clearinghouse could be merely troublesomeness or a prelude to bankruptcy. Consider again the “flash crash,” in which stock prices astoundingly plummeted for just a few minutes. Because the flash crash was midday, it was an alarming inconvenience. Had it been the last few minutes of trading, closing prices would have reflected the glitch.¹⁹⁴ That catastrophe could have bankrupted a number of “too-big-to-fail” banks.¹⁹⁵

Basket equity indices, like the S&P 500, seem to be rather robust against influence. The data on which they draw is non-voluntary, and the pool they observe is a very large slice of the relevant market. Major equity indices are updated frequently. Regulation and public disclosure surrounding their subject matter makes arbitrage relatively easy. And many have struck appropriate bal-

¹⁸⁷ See Carhart et al., *supra* note 51, at 665–67; Gallagher et al., *supra* note 51, at 16–17 (explaining that fund manager performance predicts manipulation).

¹⁸⁸ Rauterberg & Verstein, *supra* note 56, at 111–12.

¹⁸⁹ John Davies, *Using ETF's for Strategic Portfolio Construction*, S&P INDICES, <http://us.spindices.com/documents/presentations/20120705-presentation-davies-sp-indices-using-etfsstrategic-portfolio-construction.pdf>, archived at <http://perma.cc/7MWX-PJ4Y> (last visited Dec. 30, 2014).

¹⁹⁰ See Rauterberg & Verstein, *supra* note 56, at 106–08.

¹⁹¹ *Equity vs. Index Options*, OPTIONS INDUS. COUNCIL, http://www.optionseducation.org/strategies_advanced_concepts/advanced_concepts/index_options/equity_vs_index_options.html, archived at <https://perma.cc/3QFZ-3KCB?type=source> (last visited Dec. 29, 2014). Opening price are also of great importance. See *S&P Index 500 Options Product Specifications*, CBOE, http://www.cboe.com/products/indexopts/spx_spec.aspx, archived at <http://perma.cc/W723-8CAC> (last visited Dec. 27, 2014).

¹⁹² *Frequently Asked Questions About Mutual Fund Price Sharing*, INV. CO. INST. (Oct. 2002), http://www.ici.org/faqs/faq/faqs_navs, archived at <http://perma.cc/4P5X-KANP>.

¹⁹³ See HARRIS, *supra* note 181, at 32 (describing crossing networks).

¹⁹⁴ See Ananth Madhavan, *Exchange-Traded Funds, Market Structure and the Flash Crash*, 68 FIN. ANALYSTS J., July/Aug. 2012, at 20, available at <http://www.cfapubs.org/doi/pdf/10.2469/faj.v68.n4.6>, archived at <https://perma.cc/8ENE-BL8S?type=image>.

¹⁹⁵ Large banks operate with relatively low levels of equity. A sudden decline of ten percent or more in asset value would eliminate all the equity value of all but a well-capitalized institution.

ances between transparency and operational discretion. It is challenging to imagine manipulation without the collusive help of the benchmark provider, underscoring the importance of conflicts of interest in the benchmark business.¹⁹⁶

Closing prices are slightly more worrisome. Their high degree of hardwiring makes them attractive targets for manipulation. Markets demand a high degree of mechanization and transparency in their calculation, which makes it comparatively easy for manipulators to construct a strategy likely to influence the price during the relevant period.¹⁹⁷ “Banging the close,” which is the name for aggressive attacks on the closing price of a stock, is properly understood as a species of benchmark manipulation. For example, in 1999, a trader bought two hundred thousand shares of a Mexican television station in the final minutes of the trading day.¹⁹⁸ These orders represented ninety-four percent of all trading of the stock in the last hour of the day.¹⁹⁹ His objective was to escape from his obligations under a financial derivative contract, which required him to buy eight hundred sixty thousand shares unless the stock closed at greater than five dollars per share.²⁰⁰ The price increased by fifteen cents per share, barely crossing the five dollar threshold.²⁰¹

This sort of market manipulation is common.²⁰² Indeed, it is hard to find an example of stock price manipulation that does *not* target the closing (or opening) price. Recognition that closing prices share characteristics in common with crude oil and foreign currency benchmarks is an important starting point for finding comprehensive solutions to the problem of benchmark manipulation.

IV. PROTECTING AGAINST BENCHMARK MANIPULATION

Governments around the world are grappling with widespread market manipulation. The United States has followed the traditional common law approach to novel wrongdoing: preserve substantial freedom, but create private or public causes of action to hold bad actors accountable for their misdeeds. By contrast, Europe is poised for a typical civilian response: extensively regu-

¹⁹⁶ See *infra* notes 294–295 and accompanying text. Also, fund managers appear disposed to make uneconomic trades, wasting their client’s money, in order to bolster apparent returns at salient measurement periods. Gallagher et al., *supra* note 51.

¹⁹⁷ See, e.g., SEC v. Masri, 523 F. Supp. 2d 361, 363–65 (S.D.N.Y. 2007) (describing when defendant, motivated by a stock option he had sold, bought aggressively during last ten minutes of trading day).

¹⁹⁸ *Id.* at 362–65.

¹⁹⁹ *Id.* at 364–65.

²⁰⁰ *Id.* at 366.

²⁰¹ *Id.* at 375. Of course, we cannot conclude from this alone that the purchases were able to cause a price change.

²⁰² See Comerton-Forde & Putniņš, *supra* note 51, at 2–5.

late the troubled sector, eliminating the flexibility that might be used in wrongdoing.

This Part criticizes both the American *ex post* approach and the European *ex ante* approach, showing that neither evinces a good understanding of the role benchmarks play in market manipulation. First, Section A examines the American approach. The American approach fixates on fraud. But benchmark manipulation need not satisfy the key elements of a fraud action. Fraud requires a misstatement which is believed, but benchmark manipulation works even if traders are always truthful, or (conversely) even if their victims know that they are being lied to. After criticizing the current fraud-based approach, this Article argues for an alternative that emphasizes benchmark manipulation as a distinctive legal harm worthy of remedy.

Second, Section B examines the Europeans approach. The European approach imposes top-down constraints on the production and use of benchmarks, but its mandates are often quite unwise. Misunderstanding the operation of important benchmarks, the European Commission approach would tend to exacerbate the risk of benchmark abuse, while greatly curtailing innovation in the sector. In response, this Article proposes more modest legislative responses

A. Market Abuse Litigation: The “American” Approach

Using litigation to discourage benchmark manipulation is crucial to reducing it, but our current course is inadequate. Subsection 1 shows that Congress, agencies, and courts have all pushed our law to focus singularly on fraud. It also argues that, while fraud is important, anti-fraud law is not a good fit for benchmark manipulation. Subsection 2 explains why and how non-fraudulent benchmark manipulation should be considered a distinct offense under market abuse law.

1. Manipulation Through Fraud

Manipulative conduct could run afoul many bodies of law. If manipulators cooperate to execute their scheme, they might violate antitrust laws.²⁰³ They might have breached explicit or implied duties to contractual counterpar-

²⁰³ See <http://www.reuters.com/article/2015/01/05/us-jpmorgan-forex-jpmorgan-idUSKBN0KE1A420150105>, archived at <http://perma.cc/H6UT-4NJK> (settlement in FX action). *Contra In re LIBOR-Based Fin. Instruments Antitrust Litig.*, 935 F. Supp. 2d 666, 688–89 (S.D.N.Y. 2013) (dismissing anti-trust claims in rate manipulation case where where activity was never purported to be competitive), *reconsideration denied*, 962 F. Supp. 2d 606 (S.D.N.Y. 2013), *appeal dismissed*, No. 13-3565-L, 2013 WL 9557843 (2d Cir. Oct. 30, 2013), *cert. granted sub nom. Gelboim v. Bank of Am. Corp.*, 134 S. Ct. 2876 (2014), *reconsideration denied*, No. 11 MD 2262 NRB, 2014 WL 2815645 (S.D.N.Y. June 23, 2014).

ties with whom they are in privity.²⁰⁴ They might even be liable in restitution for ill-gotten gains.²⁰⁵ Yet there will be times where manipulation was not collusive, and where contractual and restitutionary plaintiffs are difficult to identify and organize. It is largely for such cases that our market abuse laws, such as the Securities Exchange Act of 1934 and the Commodities Exchange Act, make a vital contribution by specifically prohibiting manipulation. Yet even these anti-manipulation probation statutes have not been operationalized in a manner that adequately discourages benchmark manipulation.

Although section 9 of the Securities Exchange Act of 1934 prohibits intentional manipulation of securities through trading, the SEC has instead generally preferred to duck the difficult intent requirement of this statute by instead using Rule 10b-5.²⁰⁶ Rule 10b-5 is entitled “Employment of Manipulative and Deceptive Practices.” Despite mentioning manipulation in its title, the rule makes no subsequent reference to manipulation as distinct from fraud, and U.S. Supreme Court decisions have “deprived the word manipulative of any independent significance.”²⁰⁷

When courts consider cases lacking a discernable element of fraud, they are generally quite skeptical.²⁰⁸ Courts bend over backwards to exonerate defendants in so-called “open market” cases. These are cases in which each component part is a legal transaction and in which there is no fraud of any kind—the transaction is “out in the open.” Courts have been split about whether such cases can *ever* constitute manipulation.²⁰⁹ The most recent court to address

²⁰⁴ Cf. note 139 and accompanying text. It would seem that manipulating a benchmark would violate the duty of good faith.

²⁰⁵ Ariel Portat & Eric Posner, *Offsetting Benefits*, 100 VA. L. REV. 1165, 1194–95, 1200 (2014).

²⁰⁶ Securities Exchange Act of 1934 § 9, 15 U.S.C. § 78i (2012); 17 C.F.R. § 240.10b-5 (2014).

²⁰⁷ Steve Thel, *Regulation of Manipulation Under Section 10(b)*, 1988 COLUM. BUS. L. REV. 359, 384–85; see, e.g., Schreiber v. Burlington Northern, Inc., 472 U.S. 1, 12 (1985) (holding that “manipulative” in the context of securities litigation requires misrepresentation or nondisclosure); *Santa Fe Indus., Inc. v. Green*, 430 U.S. 462, 476 (1977) (“[Manipulation] generally refers to practices, such as wash sales, matched orders, or rigged prices, that are intended to mislead investors by artificially affecting market activity.”); *Ernst & Ernst v. Hochfelder*, 425 U.S. 185, 199 (1976) (defining manipulation as a species of “conduct designed to deceive or defraud investors”).

²⁰⁸ *Foss v. Bear Stearns & Co. Inc.*, 394 F.3d 540, 542 (7th Cir. 2005) (“[M]anipulation is a kind of fraud; deceit remains essential.”); *Gurary v. Nu-Tech*, 190 F.3d 37, 45 (2d Cir. 1999) (stating that the “gravamen of manipulation is deception of investors” and ruling for defendant when fraud could not be established); *In re Olympia Brewing Co. Sec. Litig.*, 613 F. Supp. 1286, 1292 (N.D. Ill. 1985) (“Regardless of whether market manipulation is achieved through deceptive trading activities or deceptive statements as to the issuing corporation’s value, it is clear that the essential element of the claim is that *inaccurate* information is being injected into the marketplace.”).

²⁰⁹ See *United States v. Regan*, 937 F.2d 823, 829 (2d Cir. 1991) (leaving unclear whether liability rested on intent alone, or intent plus deceptive practice); *In re College Bound Consol. Litig.*, No. 93 Civ. 2348, 1995 WL 450486, at *5 (S.D.N.Y. July 31, 1995) (declining to rule on sufficiency of intent for manipulation); see also *Nanopierce Techs., Inc. v. Southridge Capital Mgmt.*, No. 02 Civ. 0767, 2002 U.S. Dist. LEXIS 24049, at *6 (S.D.N.Y. Oct. 10, 2002) (“The law of the Second Circuit

these matters held that non-fraudsters commit manipulation only if “the SEC [can] prove that but for the manipulative intent the defendant would not have conducted the transaction.”²¹⁰ That is, otherwise lawful trading remains lawful if done for manipulative purposes, so long as the trader *also* had independently sufficient reason to trade.²¹¹ This is a tough standard that effectively requires the SEC to focus instead on cases involving fraud.

Courts’ focus on fraud is in keeping with the spirit in which 10b-5 was adopted.²¹² It is also arguably in keeping with the structure of the Securities Exchange Act, which does not have a general prohibition on market manipulation.²¹³ By contrast, the Commodity Exchange Act provides general anti-manipulation provisions, quite apart from fraud.²¹⁴ Yet the CFTC has struggled in vain to bring anti-manipulation claims.²¹⁵ It has lost all but one such case—a recent “bang the close” case.²¹⁶ One recent case may give a sense of insuperable barriers to winning without showing fraud. Four traders were charged with manipulating the propane market by making bids and offers (and subsequent

on so-called open-market manipulation—where the alleged manipulator has made otherwise legitimate trades, yet with the subjective intent to affect the stock price thereby—is not yet fully settled.”). Compare *GFL Advantage Fund, Ltd., v. Colkitt*, 272 F.3d 189, 205 (3d Cir. 2001) (stating that manipulative intent alone is not sufficient), with *Markowski v. SEC*, 274 F.3d 525, 528–29 (D.C. Cir. 2001) (stating that manipulative intent alone is sufficient).

²¹⁰ *SEC v. Masri*, 523 F. Supp. 2d 361, 372 (S.D.N.Y. 2007); accord *ATSI Commc’n, Inc. v. Shaar Fund, Ltd.* 493 F.3d 87, 100 (2d Cir. 2007) (requiring a showing of deception with respect to how other market participants valued the security); see *United States v. Mulheren*, 938 F.2d 364, 369 (2d Cir. 1991) (using, without adopting, an even more stringent “solely” for manipulative purposes standard).

²¹¹ The *Masri* court approvingly cites scholars Daniel Fischel and David Ross in their discussion about intent. See 523 F. Supp. 2d at 372 (citing Fischel & Ross, *supra* note 12, at 512).

²¹² Rule 10b-5 was quickly drafted and approved and the only discussion reported was Commissioner Pike’s offhand remark, “Well, we are against fraud, aren’t we?” Milton V. Freeman, *Colloquium Foreword*, 61 *FORDHAM L. REV.* S1, S1–S2 (1993).

²¹³ See Securities Exchange Act of 1934 § 9, 15 U.S.C. § 78i (2012) (prohibiting manipulation for the purpose of inducing purchase or sale of a security, or creating the false or misleading appearance of market activity); see also Securities Act of 1933 § 17(a), 15 U.S.C. § 77q (2012) (prohibiting fraud); Securities Exchange Act of 1934 § 10(b), 15 U.S.C. § 78j (2012) (making unlawful “any manipulative or deceptive device” in connection with the purchase or sale of a security, in contravention of an SEC rule). This is the starting place for Rule 10b-5 and its anti-fraud jurisprudence.

²¹⁴ See Commodity Exchange Act §§ 6, 9, 7 U.S.C. §§ 9, 13 (2012); Energy Policy Act of 2005 §§ 315, 1283, 15 U.S.C. § 717c, 16 U.S.C. § 824 (2005); Cox, [1986–1987 Transfer Binder] 786 *Comm. Fut. L. Rep.* (CCH) ¶ 23,786 (July 15, 1987).

²¹⁵ Craig Pirrong, *Commodity Market Manipulation Law: A (Very) Critical Analysis and a Proposed Alternative*, 51 *WASH. & LEE L. REV.* 958, 959 (1994) (“[C]urrent precedents make it extremely difficult to find a trader guilty of manipulation even in cases in which the economic analysis suggests that the trader has indeed manipulated.”).

²¹⁶ JERRY MARKHAM, *LAW ENFORCEMENT AND THE HISTORY OF FINANCIAL MARKET MANIPULATION* 288 (2014).

purchases and sales) intended primarily to influence the market price.²¹⁷ The district court dismissed the charges as a matter of law: “Acting in a manner that shifts the price of a commodity in a favorable direction is the business of profit-making enterprises, and if it is done without fraud or misrepresentation, it does not clearly violate the CEA.”²¹⁸

After decades of the CFTC attempting to win manipulation cases without alleging fraud,²¹⁹ Congress has seemingly ratified the judicial focus on fraud, by including in Dodd-Frank statutory language granting the CFTC fraud-based manipulative enforcement authority.²²⁰ The CFTC has adopted an anti-fraud rule that tracks the language of SEC Rule 10b-5 and explicitly incorporates most SEC anti-fraud doctrine.²²¹

This triumph of securities-style anti-fraud has been replicated in the remaining two market abuse statutes,²²² such that the twenty-first century has seen a complete administrative and legislative endorsement of the fraud theory of manipulation. The Federal Energy Regulatory Commission (FERC), the regulator charged with maintaining our natural gas and electricity markets, has also adopted a rule tracking 10b-5.²²³ As if that were not enough to make the point, FERC then rescinded an existing rule that appeared to target non-fraudulent manipulation, concluding that, “[M]arket power is a structural issue to be remedied, not by behavioral prohibitions”²²⁴ Market participants appear free to conduct themselves manipulatively, so long as they do so truthfully.

²¹⁷ *United States v. Radley*, 659 F. Supp. 2d 803, 805–09 (S.D. Tex. 2009), *aff’d* 632 F.3d 177 (5th Cir. 2011).

²¹⁸ *Id.* at 816.

²¹⁹ On the challenges the CFTC faced in pursuing manipulation claims without fraud, see Rosa Abrantes-Metz, Gabriel Rauterberg, & Andrew Verstein, *Revolution in Manipulation Law: The New CFTC Rules and the Urgent Need for Economic and Empirical Analyses*, 15 U. PENN. J. BUS. L. 357, 369–78 (2013).

²²⁰ Dodd-Frank Act § 753, Pub. L. 111-203, 124 Stat. 1750 (amending Commodity Exchange Act, § 6(c), 7 U.S.C. § 9 (2012)).

²²¹ Compare 17 C.F.R. § 180.1 (2012) (granting CFTC fraud-based manipulative authority), with 17 C.F.R. § 240.10b-5 (2014) (granting SEC fraud-based manipulative authority).

²²² Natural Gas Act, 15 U.S.C. § 717c-1 (2012) (prohibiting manipulative practices, as described in the Securities Exchange Act, 15 U.S.C. § 78j(b) (2012)); Federal Power Act, 16 U.S.C. § 824v (2012) (prohibiting manipulative practices, as described in the § 78j(b)); Prohibition of Energy Market Manipulation, 71 Fed. Reg. 4244, 4244–58 (Jan. 26, 2006) (to be codified at 18 C.F.R. pt. 1c) (providing anti-manipulation rules under Federal Power Act and Natural Gas Act).

²²³ Prohibition of Energy Market Manipulation, 71 Fed. Reg. at 4244–58.

²²⁴ Order Revising Market-Based Rate Tariffs and Authorizations, 114 FERC ¶ 61,165, at 10 (Feb. 16, 2006), available at <http://www.ferc.gov/enforcement/enforce-res/invest-MBR-02-16-2006.pdf>, archived at <https://perma.cc/DUA3-PQSQ?type=pdf>; see David Spence & Robert Prentice, *The Transformation of American Energy Markets and the Problem of Market Power*, 53 B.C.L. REV. 131, 162 (2012) (“FERC specifically rejected the notion that Rule 2 had been aimed at curbing . . . conduct not involving deception and fraud . . .”).

The recent focus on fraud is understandable for both practical and principled reasons. First, there is no doubt that fraudulent manipulation is possible: fraud clearly meets the theoretical burden set out by manipulation skeptics in Part I. Though it is costly to affect prices by gigantic purchases, it is cheap to do it with a lie, and easy enough that even a high school student can do it.²²⁵ Second, regulators have seen greater successes under 10b-5-type manipulation authority than through causes of action unconnected to fraud. Third, fraudulent manipulation works by spreading misinformation, which is a considerable evil given the importance of informational efficiency to capital markets.²²⁶ Insofar as a fraud is a distinctive harm, manipulation cases can instrumentally serve to pursue an independently bad act. Fourth, some part of the law's reluctance to pursue manipulation in the absence of fraud is no doubt a concern about false positive.²²⁷ Trade-based manipulation often resembles legitimate trading techniques by informed traders that are socially beneficial.²²⁸ Courts would be loath to mistakenly punish an ordinary or informed speculator. Focusing on fraud extricates us from this problem. Fraud looks sufficiently different from all socially valuable behaviors that we are not worried about convicting the innocent.

Although it is understandable why officials might favor a fraud-focused view of manipulation, these trends do not bode well for law enforcement. This is because benchmark manipulation is an unlikely candidate for anti-fraud laws. Although benchmarks make a fine platform for fraud,²²⁹ their distinctive benefit is magnifying the manipulative power of real trades and information. The elements of common law fraud include misrepresentation and reliance.²³⁰ Both of these elements may be absent from benchmark manipulation.

²²⁵ MICHAEL LEWIS, *NEXT: THE FUTURE JUST HAPPENED* 27–28 (2001) (describing how a high school student made almost a million dollars by planting optimistic rumors on Yahoo Finance message boards).

²²⁶ Zohar Goshen, *The Essential Role of Securities Regulation*, 55 DUKE L.J. 711, 713 (2006).

²²⁷ See Fischel & Ross, *supra* note 12, at 519–23.

²²⁸ See *id.* at 519–22 (arguing that certain trading strategies, often associated manipulative schemes, have legitimate justifications); Kyle & Viswanathan, *supra* note 19, at 274 (arguing that trading should only be prohibited if it harms both liquidity and price discovery, and much manipulation does not); Jiang et al., *supra* note 23, at 148–50 (arguing that some prominent examples of trade-based manipulation were really just informed trading).

²²⁹ See *U.S. Commodity Futures Trading Comm'n v. Johnson*, 408 F. Supp. 2d 259, 263–65 (S.D. Tex. 2005).

²³⁰ See, e.g., *Strategic Diversity, Inc. v. Alchemix Corp.*, 666 F.3d 1197, 1210 n.3 (9th Cir. 2012). Note that reliance is an element of private civil securities actions, but not where the SEC or DOJ is the plaintiff. DONNA M. NAGY, RICHARD W. PAINTER, MARGARET V. SACHS, *SECURITIES LITIGATION AND ENFORCEMENT* 149 (2011).

a. *Misrepresentation*

First, consider misrepresentation. Benchmark manipulation can occur by way of selective disclosure or strategic trading. Selective disclosure involves releasing to the benchmark provider only data relating to some of one's market conduct, such as trades, while strategic trading may involve adopting some consistent policy for sharing data (for, example, report nothing) but guiding market conduct in such a way that the net result will bias the benchmark. The former is unlikely to qualify as misrepresentation, while the latter assuredly does not.

Selectively reporting trades—for example, reporting only one's aggressive sales, but never one's purchases—involves literally true statements, so such conduct can constitute a misrepresentation only if the trader is under a duty to disclose the omitted trade information.²³¹ Such a duty is implausible in many cases of benchmark manipulation. In many markets, the norm is to provide about ten percent of transactional data and it is well known that parties allow business considerations to influence the selection.²³² It seems unlikely that any listener has a reasonable expectation that others will report in a forthright and representative fashion.

The absence of fraud is even clearer where the manipulator never affirmatively reports anything. Instead of imagining a trader who reports every sell and omits every buy, we could imagine a trader who reports nothing, but tried to sell to parties known to report their trades and buy only from counterparties who tend not to report.²³³ A selective trading strategy would support a record of ample selling that could bias the benchmark price downward to the same degree as selective reporting.

Selective trading can achieve a similar effect, as exemplified in the foreign exchange market. In that market, only trading on a certain electronic system figures into the benchmark. A trader could make her large sales through

²³¹ See *Basic Inc. v. Levinson*, 485 U.S. 224, 239 n.17 (1988) (“To be actionable . . . a statement must . . . be misleading. Silence, absent a duty to disclose, is not misleading under [the federal securities laws.]”); *Merrill Lynch & Co. Inc. v. Allegheny Energy, Inc.*, 500 F.3d 171, 181 (2d Cir. 2007) (“Where a defendant, as here, seeks to show fraud by omission, it must prove additionally that the plaintiff had a duty to disclose the concealed fact.”); *In re Time Warner Inc. Sec. Litig.*, 9 F.3d 259, 267 (2d Cir. 1993) (“[A]n omission is actionable under the securities laws only when the [defendant] is subject to a duty to disclose the omitted facts.”).

²³² See *supra* notes 176–202 and accompanying text; see also BD. OF THE INT’L ORG. OF SEC. COMM’NS, *supra* note 68, at 29 (stating that data providers are under no obligation to submit data). Some have suggested that Regulation FD and relevant provisions of Sarbanes-Oxley might limit strategic disclosure, but that is not a natural inference from either document. Fattouh, *supra* note 96, at 33 n.44.

²³³ An increasingly portion of the market may be reluctant to submit data at all, fearing liability. Stewart, *supra* note 170, at 6.

the Reuters system, and make her large purchases by telephone or through another electronic system.²³⁴ While *timing* trades to impact the benchmark, or *generating* uneconomic trades,²³⁵ might sometimes be considered fraudulent, these traders might make real trades with an economic basis at their natural time. In a world in which trillions of dollars are transacted both on and off the electronic system, and where many reasons motivate the venue choice, it is implausible that the choice of trade location can be regarded as a material omission or a material misstatement. But the choice of venue is a choice as to whether or not to impact the benchmark.

Consider one final example of how real trades, conducted in the open, have been used to manipulate a benchmark without making any statement. In the famous 1940 U.S. Supreme Court case, *United States v. Socony-Vacuum Oil Co.*, the government's complaint originally argued that the leading benchmarks, including Platts, were complicit in a plot by oil companies to control the price of oil.²³⁶ The prosecution even called the benchmarks' complicity, "the nub of the Government's case."²³⁷

The oil companies, it was argued, bought up all the oil sold by third-party refiners in order to feed into benchmarks some very high market prices.²³⁸ That would assure them very high revenue from their many long-term sale contracts drawing on the benchmark.²³⁹ Against this, the oil companies presented evidence that (1) the oil companies bought at very *low* prices in the open market, such that their reporting would have lowered the benchmark;²⁴⁰ and (2) in any case, the benchmarks categorically excluded purchases by major oil companies

²³⁴ BANK FOR INT'L SETTLEMENTS, *supra* note 126, at 9 ("They can evade detection . . . by executing large flows in less transparent venues, including reverting to transacting bilaterally over the telephone.").

²³⁵ Order Assessing Civil Penalties, 144 F.E.R.C. ¶ 61,041, at 21, 40 (July 16, 2013), *available at* <http://www.ferc.gov/eventcalendar/Files/20130716170107-IN08-8-000.pdf>, *archived at* <https://perma.cc/K888-FMGF?type=pdf>.

²³⁶ Transcript of Record at 24, *United States v. Socony-Vacuum Oil Co. (Socony-Vacuum Oil Co. I)*, 310 U.S. 150 (1940) (Nos. 346, 347) (citing the indictment). The benchmark providers were supposedly tolerant to this practice. *Id.* at 58 ("Now, here it is alleged that these trade journals knew everything that has been alleged in that indictment, and then intentionally participated in it. Now, if knowing of that they had put their feet down and said, 'No, we won't cooperate,' they could have prevented this particular scheme from working.").

²³⁷ *Id.* at 105–06.

²³⁸ *United States v. Socony-Vacuum (Socony-Vacuum Oil, Co. II)*, 105 F.2d 809, 814–15 (7th Cir. 1939).

²³⁹ Brief for the Respondents at 121, *Socony-Vacuum Oil Co. I*, 310 U.S. 150 (Nos. 346, 347) (noting that some fifty percent of contracts had hardwired industry benchmarks as payment term).

²⁴⁰ Transcript of Record, *supra* note 236, at 1184, 1558–66, 3457–60, 3783, 3807–10, *Socony-Vacuum Oil Co. I*, 310 U.S. 150 (Nos. 346, 347).

from their methodology.²⁴¹ Sensing that they could not prevail on their benchmark manipulation argument, the government abandoned it.²⁴²

In fact, the oil companies' two arguments contradicted one theory of benchmark manipulation but strongly supported a different theory of manipulation. Oil companies' purchases of gasoline were excluded from the benchmark companies' datasets. But the absence of influence is a kind of influence. Every barrel of oil bought by the major oil companies was a barrel that could not be bought by one of the middlemen ("jobbers") whose purchases *were* included in the benchmark rate. By buying up any oil priced more cheaply than the current benchmark price, the oil companies could support the benchmark price against falling with the market. In this context, guilt is magnified rather than reduced by the fact that ninety-one percent of the oil purchased in this way was bought below the benchmark price.²⁴³ Had jobbers acquired it, the benchmark would have plummeted. By buying it themselves, the oil companies disqualified the oil from inclusion in the benchmark—all without lying, selectively disclosing data, or buying at artificial prices.

b. *Reliance*

As to reliance, common law fraud has long required a plaintiff to demonstrate that she actually knew about the alleged misrepresentative actions and changed her conduct accordingly.²⁴⁴ For example, a seller's representation of a car's patent defects ("it looks old, but it is actually a new car") may be actionable, but only if the buyer hears the statement, reasonably believes it, and buys the car as a result. Our market abuse laws sometimes require this sort of "eyeball" reliance,²⁴⁵ and sometimes presume reliance.²⁴⁶ But, if the defendant can show an absence of reliance, then it is a bar to recovery.²⁴⁷

Sometimes, benchmark manipulation may result in reliance. For example, a person may read the Kelley Blue Book value of a car and decide to buy a certain car on that basis. If the printed car value was intentionally inflated be-

²⁴¹ *Id.* at 3783, 3807–10.

²⁴² *Socony-Vacuum Oil Co. II*, 105 F.2d at 813 n.3 (dropping the indictment against price reporting agencies due to "legal insufficiency of the evidence to connect those defendants with the alleged conspiracy"). Indeed, this is part of why the case has come to stand for the doctrine of *per se* illegality under the Sherman Act; the holding need not have been so stark—that an agreement to fix prices and nothing more, suffices for liability—if the government had been able to demonstrate benchmark manipulation.

²⁴³ Brief for the Respondents, *supra* note 239, at 230.

²⁴⁴ See *Acito v. IMCERA Grp., Inc.*, 47 F.3d 47, 52 (2d Cir. 1995) (holding that reliance on defendant's false action is required for Rule 10b-5).

²⁴⁵ Securities Exchange Act of 1934 § 18(a), 15 U.S.C. § 78r(a) (2012).

²⁴⁶ See *Basic Inc. v. Levinson*, 485 U.S. 224, 241–47 (1988).

²⁴⁷ See *Halliburton Co. v. Erica P. John Fund*, 134 S.Ct. 2398, 2414–16 (2014).

cause of the data contributed by some dealership, it is conceivable that reliance can be demonstrated.

Not all benchmark manipulation, however, works its injury through reliance. In particular, when a benchmark term is hardwired into a price term, the payer is legally obliged to pay regardless of whether she believes that the price benchmark is currently accurate. One important effect of stipulating a formula that includes a benchmark is to avoid the day-to-day cost of convincing your counterparty to transact at a given price. The benchmark becomes dispositive at the time when it is adopted. While the parties continue to *depend* upon the benchmark and *use* the benchmark, dependence and use are not reliance.²⁴⁸

Without misstatements and reliance, benchmark manipulation is a poor target for anti-fraud litigation. That is not to say that the law could not be made to cover these cases. “Fraudulent devices” is a term of art, and 10b-5 and her progeny are meant to be catch-alls.²⁴⁹ Moreover, many defendants will find mere scrutiny by regulators sufficient to motivate settlement; in that sense, it matters less whether fraud is a good fit for benchmark manipulation than whether SEC or CFTC are motivated to scrutinize instance of benchmark manipulation. However, regulators’ bargaining power is shaped by courts’ possible behavior. If courts continue to be motivated by the doctrinal heritage of these rules, then anti-fraud rules can only go so far stop these abusive practices.

2. Better Enforcement by Protecting Price Reports

Given the obstacles that our current regulatory regime faces in protecting against benchmark manipulation, a new approach is required. This new approach would reject the fallacy that *if* benchmarks are proxies for price *then* legal protections of benchmarks are proxies for protections of price. To the contrary, benchmarks are of independent significance, worthy of their own separate legal protection. It is worthwhile to attend momentarily to two reasons

²⁴⁸ One or more party may have relied *ex ante* when deciding to incorporate the benchmark into the contract. But it would not have been *reasonable* reliance to believe that the benchmark was sure to be accurate. Most benchmarks’ documentation bear ample disclaimers as to accuracy. Nor would a reliance claim against the benchmark go to the manipulator. In the ordinary sense of reliance, the payer is unlikely to have relied upon the trader’s representations about truthfulness given that the payer has never communicated with the payer, the trader may not have even been in business at that time the benchmark was selected.

²⁴⁹ Enforcement with respect to LIBOR has utilized fraud claims in settling with major banks. *See, e.g.,* Press Release, *UBS Securities Japan Co. Ltd. to Plead Guilty to Felony Wire Fraud for Long-running Manipulation of LIBOR Benchmark Interest Rates*, Dep. of Justice (Dec. 19, 2012), <http://www.justice.gov/opa/pr/ubs-securities-japan-co-ltd-plead-guilty-felony-wire-fraud-long-running-manipulation-libor>, archived at <https://perma.cc/EJV8-X6SV?type=source>. But it remains to be seen whether fraud is sufficient for all of the LIBOR lawsuits, and for the manipulation of other benchmarks.

why the law might opt to provide fundamentally different and distinctive protections for benchmarks as opposed to prices generally.

First, trustworthy benchmarks are essential infrastructure to common ventures in a way that trustworthy prices themselves are not. Benchmarks serve as common referents in commerce, in much the way that weights and measures do.²⁵⁰ They do not tell us how much a farmer should be paid, any more than knowing what a “bushel” is tells us how much corn the farmer should deliver. But negotiations are likely to go far easier if both parties know how much money is often paid for a bushel of this sort of corn.²⁵¹ Benchmarks provide the tools to discuss the matter and focal points from which to decide what is fair. Common understandings allow some negotiations, and even more litigation, to be avoided by including a mutually agreeable benchmark into a contract. And those common understandings tend to iterate, promoting networks of common use and understanding.²⁵² This is particularly true for benchmarks in financial derivatives, which are essential to markets.²⁵³

The same network effects cannot be said for actual prices. Little is gained by pursuing widespread agreement as to an asset’s price itself. To the contrary, markets are predicated on widespread disagreement about the actual price of assets. Buyers buy, or sellers sell, in large part because they think that recent transactions depart from a better conception of market price. Such disagreement is a precondition for liquid markets and markets are thought to be the best way for resolving such disagreement. The government need not resolve this disagreement, and so, market abuse law must cease its goal of price protection somewhere before exterminating ordinary market optimism (or pessimism). On the contrary, there is good reason to encourage widespread adoption of the same benchmarks.

²⁵⁰ The importance of such standards awards them the distinct honor of being among the subject of Congress’s enumerated powers. U.S. CONST. art. I, § 8, cl. 5.

²⁵¹ On weights and measures, see Joel T. Rosenthal, *The Assizes of Weights and Measures in Medieval England*, 17 WESTERN POL. Q. 409, 409 (1964).

²⁵² Interestingly, the appropriate degree of protection does not appear to depend greatly on the fragility of the network. A fragile network deserves protection because it is a valuable thing that can be destroyed. A durable network is worthy of protection because of its tendency to rationally discourage self-help. For example, the widespread use of LIBOR provided an independent reason to use it. The expected cost from manipulation was dwarfed by the expected benefits of joining a network of users. Such LIBOR users are demonstrably better off than they would be by individually switching to a new benchmark, and that is precisely why law may be an appropriate tool to improve LIBOR. Without legal interventions, users may long accept a good-enough benchmark.

²⁵³ Widespread agreement to set contract prices to Platts’s Dated Brent allows a robust market to form. The same cannot be said of prices. Widespread agreement to set contract prices to “the current price of oil from the North Sea, commonly called ‘Brent’” provides no such benefit. Furthermore, the ability to make a bet on the movement of an asset *relative* to a widely known benchmark is a precondition for sophisticated hedging and speculative strategies.

The fact that the law must limit itself in protecting prices, in a way that it need not for price benchmarks, serves as transition into the second reason that price benchmarks deserve distinctive legal protections: that they are especially protectable.

It is *conceptually easier* to protect price reports than prices. “Price” is an ambiguous concept, and so proving artificial price is a conceptually difficult thing. What is the price of crude oil? Is it the most recent price paid for it? Or the most recent price paid for a certain large quantity? Or the price that someone is now offering to pay (perhaps, as reflected in bid/ask spreads)? Do taxes count? Counterparty? Although these definitional issues are commonly given inadequate attention, they must be addressed whenever price manipulation is alleged. Yet a defendant may have altered one but not another conception of price, leaving conceptually unclear how the law applies to the facts, and leaving analytically open what facts must be demonstrated to prevail. The ambiguity of “price” does not render it useless, but it renders price a poor damsel to be saved from distress.

Price reports stand ready for defense though. While debates are possible, we mostly know what we mean when we say Platts Dated Brent. We know what it is, and we know what it means for it to be manipulated. It is manipulated when data is submitted in a way that Platts would consider to undermine the integrity of its methodology or otherwise disallow.²⁵⁴ Focusing on efforts to frustrate the benchmark will raise many of the same issues as a price manipulation case—*is there a benign explanation for this trader’s suspicious behavior?*—but some deep conceptual questions are avoided altogether. An ideal manipulation regime would recognize this philosophical difference and choose to draw its line at the more important and more defensible place in the sand: the proxy and not the price itself.

If there is merit to banning benchmark manipulation, apart from manipulation of the price itself, we will wish to ask how realistic is a benchmark-centric approach to manipulation? Actually, no particular legislative action is required, at least in the commodities market.²⁵⁵ We already have statutory clauses perfectly suited to the purpose: the “Price Reports Clauses.” The Commodity Exchange Act prohibits “causing to be delivered . . . false or misleading or inaccurate report concerning crop or market information or condi-

²⁵⁴ Two caveats are noteworthy. First, manipulation is clearly present when Platts itself seeks to facilitate manipulation, even if Platts’s rules are followed. Second, there may be some public use of a benchmark that is so widespread that the public has claim on the operation of the benchmark. The manipulation of LIBOR would not have been much better if there were a footnote on its provider’s web page authorizing fraudulent submissions.

²⁵⁵ For securities, Congressional action might be required to amend the Securities Exchange Act of 1934, though there is little doubt that the SEC could shoehorn a Price Reports Rule into 10b-5.

tions that affect or tend to affect the price of any commodity in interstate commerce”²⁵⁶ These clauses prohibit misleading price reports, quite apart from whether anyone is misled.

Numerous actions have been brought under these clauses, but they have focused on *false* submissions to price reporting agencies.²⁵⁷ For example, following the collapse of Enron, the CFTC brought numerous natural gas and electricity cases for telling benchmark providers about fictional transactions or those lacking in substance.²⁵⁸ In general, the CFTC has tended to treat the Price Reports Clause as a shortcut to prosecuting otherwise illegal acts.²⁵⁹ Proving that a trader lied to a price-reporting agency, if sufficient, eliminates the need to prove that the lie caused an artificial price or that the trader intended to so cause.

Perhaps because of the emphasis on fraud, courts have shown little interest in applying Price Reports Clauses to benchmark abuse.²⁶⁰ Consider one striking example. Feeder cattle price futures contracts exhibit substantial hardwiring: the final value of CME cattle derivatives is deduced from the CME Feeder Cattle Index, which incorporates the U.S. Department of Agriculture’s weekly public cattle report, which is derived from transactional data voluntarily submitted to the USDA by farmers and traders. In 2006, in the Nebraska District Court case *Commodity Futures Trading Commission v. Delay*, the defendant and associates initiated five cattle purchases at prices rather higher than prevailing rates, thereby increasing the price of cattle futures they owned.²⁶¹ Even though the court agreed that the transaction was “highly suspicious,” it dismissed the CFTC’s action, holding “it is not a violation of the statute to report feeder cattle sales to the USDA with the intention of moving

²⁵⁶ 7 U.S.C. § 9(1)(A) (2012) (added in the Dodd-Frank Act, Pub. L. 111-203, 124 Stat. 1750 (codified in scattered sections of 12 U.S.C. and 15 U.S.C. (2012))); *accord* 7 U.S.C. § 13(a)(2) (2012) (stating criminal penalty for the same violation).

²⁵⁷ *See, e.g.*, U.S. Commodity Futures Trading Comm’n v. Atha, 420 F. Supp. 2d 1373, 1376–78 (N.D. Ga. 2006) (alleging false reporting). Interestingly, LIBOR settlements have also drawn on the price reports clauses. *See* Order Instituting Proceedings Pursuant to Sections 6(C) and 6(D) of the Commodity Exchange Act, as Amended, Making Findings and Imposing Remedial Sanctions at 34, Barclays PLC, CFTC No. 12-25 (June, 26, 2012), *available at* <http://www.cftc.gov/ucm/groups/public/@lrenforcementactions/documents/legalpleading/enfbarclaysorder062712.pdf>, *archived at* <https://perma.cc/S9TS-U4UU>.

²⁵⁸ *United States v. Reliant Energy Servs., Inc.*, 420 F. Supp. 2d 1043, 1045–47 (N.D. Cal. 2006); *In re Dynegy Mktg. & Trade, Comm. Fut. L. Rep. (CCH) ¶ 29,262, 2–5* (CFTC 2002).

²⁵⁹ JERRY MARKHAM, COMMODITIES REGULATION: FRAUD, MANIPULATION & OTHER CLAIMS § 16:10.50 (2012) (describing CFTC’s post-Enron uses of the Price Report Clause as another attempt by the CFTC to avoid proving substantive manipulation).

²⁶⁰ There may also be a cloud over the Clauses because of suspicions that Enron inspired actions may have been targeting legitimate market behaviors that simply sought to maximize profits in light of defective pricing laws. *See id.*

²⁶¹ No. 7:05CV5026, 2006 WL 3359076, at *1 (D. Neb. 2006).

the CME index up or down—rather, to be unlawful, the reported sales must be sham or nonexistent transactions, or the reports must be knowingly false or misleading.”²⁶² *Delay* has come to stand for the infamous proposition that intentional benchmark manipulation, absent fraud or fraudulent transactions, is not unlawful.²⁶³

Because abuse of price reports is a distinctive harm, apart from manipulation of prices themselves, it makes sense to reinvigorate the two statutory clauses assigned to remedying it. Our peers in Europe acted quickly, in the wake of massive interest rate benchmark scandals, to adopt a regulation recognizing benchmark manipulation as a distinctive illegal act.²⁶⁴ They did so out of concern that their general market abuse regulations did not sufficiently identify benchmarks as worthy of protection, apart from any underlying prices.²⁶⁵ Europeans believed that they were following America in creating these rules. Irony is no bar to us following their lead in the same spirit.

It is not possible or desirable here to outline an entire jurisprudence of price reports, but some important features can be noted.²⁶⁶ Courts must provide clarity on unanswered questions arising out of the “open market” manipulation cases. Courts seem to agree that a party cannot be a manipulator if she makes only real trades with sufficient genuine economic purposes. That is, an actual purchase of securities, motivated by a desire to own the securities, cannot be manipulation, even if you also wished to influence the price. Yet this construction takes the trade to be a monolithic thing, which either was or was not—as a whole—motivated by economic purposes. And yet, trades can be disaggregated into smaller elements, each element of which can be properly or improperly

²⁶² *Id.* at *3.

²⁶³ *In re Amaranth Natural Gas Commodities Litig.*, 587 F. Supp. 2d 513, 533–34 n.133 (S.D.N.Y. 2008) (citing *Delay*, 2006 WL 3359076); JERRY MARKHAM, LAW ENFORCEMENT AND THE HISTORY OF FINANCIAL MARKET MANIPULATION 385 (2014). *But see In re McMahan*, Comm. Fut. L. Rep. (CCH) ¶ 31,662, 2010 WL 4491884, at *5–8 (CFTC Nov. 5, 2010) (facing similar fact pattern but convicting for false reporting).

²⁶⁴ Directive 2014/57 of the European Parliament and of the Council of 16 Apr. 2014 on Criminal Sanctions for Market Abuse, 2014 O.J. (L 173) 29–30, available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.173.01.0179.01.ENG, archived at <http://perma.cc/MDW4-YJGC> (defining manipulation to include “transmitting false or misleading information or providing false or misleading inputs or any other behaviour which manipulates the calculation of a benchmark”).

²⁶⁵ *Amended Proposal for a Regulation of the European Parliament and of the Council on Insider Dealing and Market Manipulation*, at 2–3, COM (2012) 0421 final (July 25, 2012), available at http://ec.europa.eu/internal_market/securities/docs/abuse/COM_2012_421_en.pdf, archived at <http://perma.cc/7VC6-HMQF>.

²⁶⁶ The difficulty of spelling out the contours of any manipulation regime, or even an adequate definition of “manipulation” may be part of why the CFTC and SEC have cleaved to fraud based accounts of manipulation. Nor is a perfect doctrine sufficient for optimal enforcement. Such causes of action increase the importance of sophisticated detection and proof techniques. For a description of empirical screens and their application, see generally Abrantes-Metz et al., *supra* note 219.

motivated. For example, a trader may buy an asset out of genuine investment interest, but her choice of where, when, from whom or how to buy it may have non-investment motivations. Benchmark manipulation often works in precisely this way. Having committed to buying an asset for genuine economic reasons, a trader has the option to trade either (A) in a manner that the benchmark will either incorporate the trade; or (B) such that the benchmark will not incorporate the trade. When the price is identical across venues, the current doctrine would give the trader a free pass to strategically affect the benchmark. And when prices are nearly identical, there will be great practical difficulties with showing that an inferior price was elected for manipulative purposes.²⁶⁷

It is clear that manipulative intent should be prohibited not just in respect to whether to transact, but in respect to how to transact. The same must be true of data submission. A trader who releases only the most strategically chosen subset of her trade data may offend the Price Reports Clauses.

Still, caution here is appropriate.²⁶⁸ Not only are misunderstandings possible in hindsight, but the institutional context of data submission is vital, too. After all, there is *never* an investment reason to voluntarily submit data to a benchmark provider; the investment has been made, regardless of whether one decides to announce it. Whether the motives be manipulative, civic (to preserve the valued social institution of the benchmark), or some other reason, firms will have some agenda when they submit data. Is all such data submission to be suspect? Punishing such mixed-motives cases too aggressively is guaranteed to silence voluntary data contributors. Unless widespread participation is compelled,²⁶⁹ the fear of liability will discourage data submission. And even then, the fear of liability would discourage some legitimate trading, which stands to harm price discovery and liquidity. Genuinely manipulative motives must be distinguished from the simple absence of investment motives, which remains difficult task. The law must balance chilling effect of unjustified prosecution must be weighted against the ill of market manipulation.

²⁶⁷ These difficulties are only greater when the trader is an intermediary handling trades for a client. Such a trader has many opportunities to select the venue of her choice at no or little cost to her client. Indeed, as a practical matter, client-facing business provides apparent justification for nearly any transaction. A trader who sells at rock bottom prices or buys too dearly may have been hedging past or future customer orders. The presence of an offsetting customer order is helpful circumstantial evidence for the manipulator. Indeed, it is telling that regulators will be drawn down the rabbit hole of showing a *lack* of offsetting customer orders; historically, the CFTC has spent its time trying to show the *presence* of offsetting orders. The Commodity Exchange Act specifically prohibits wash trades, or transactions designed to offset one another and thereby eliminate any economic substance. Complex institutions with responsibilities for other people's money gain a smokescreen against regulatory scrutiny as they pursue non-fraudulent manipulations.

²⁶⁸ It is appropriate, therefore, that the CFTC has adopted a "good faith mistake" provision in its rule, tracking the statute. 17 C.F.R. § 180.1(a)(4) (2012).

²⁶⁹ See *infra* notes 282–292 and accompanying text.

B. Benchmark Regulation: The “European” Approach

Can governments make forward-looking rules that reduce the prevalence of manipulation before it ever occurs? This Section examines efforts to regulate production and use of benchmarks before they are manipulated. It takes the European Commission’s Proposed Regulation of Benchmarks as its primary foil. The Proposed Regulation is the most ambitious and among the most viable proposals for reshaping the benchmark space. The Proposed Regulation would ban the use of some particularly vulnerable or unsuitable benchmarks and institute new governance and transparency requirements for the rest.

Although these proposals are not outrageous, they do not reflect adequate understanding of the role and operation of benchmarks. The proposed regulation is badly under-inclusive, making arbitrary distinctions between the benchmarks that are subject to regulation and those that are not.²⁷⁰ It is unlikely that ESMA (the European SEC) will be better at detecting flawed rates than would be market participants, nor more courageous in outlawing a benchmark that the market still finds attractive. What little indication we have suggests that European regulators will target benchmarks that are politically salient ra-

²⁷⁰ *Proposal for a Regulation of the European Parliament and the Council on Indices Used as Benchmarks in Financial Instruments and Financial Contracts*, at 7, COM(2013) 641 final (Sept. 18, 2013) [hereinafter *Proposed Regulation*], available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0641:FIN:EN:PDF>, archived at <https://perma.cc/U83H-NYLA?type=pdf>. The EC regulation applies only to financial derivatives, investment funds, and consumer financial contracts such as mortgages. However, benchmarks are hardwired into far more contracts than just those. Employment contracts, supply contracts, and many spot contracts all use benchmarks. Moreover, courts will frequently use benchmarks in assessing damages, implicitly integrating the benchmark into any breached contract. *See, e.g.*, *Banque Paribas v. Landsea Mktg, Inc. (In re Landsea Mktg.)*, 53 B.R. 436, 437 (Bankr. C.D. Cal. 1985) (deciding whether to use LIBOR or Prime as the rate for lost damages). The EC regulation excludes these other types of benchmark uses, even though the EC’s own impact assessment identifies several of these uses. *Commission Staff Working Document Impact Assessment*, at 5, 78–80, COM(2013) 641 final (Sept. 18, 2013) [hereinafter *Impact Assessment*], available at <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52013SC0336>, archived at <http://perma.cc/XN4R-5VHZ> (citing supply contracts as a specific concern and discussing the impact on spot contracts). Likewise, the regulation specifically excludes single-asset benchmarks, such as closing prices of securities, *Proposed Regulation, supra*, at 14, even though the regulation’s definition of a benchmark or index clearly contemplates such narrow-focused proxies. *Id.* at 21 (defining “index” as calculated “on the basis of the value of *one* or more underlying assets, or prices, including estimated prices, or other values.”) (emphasis added). The Commission reasons that single-item benchmarks are to be excluded because “there is no calculation, input data or discretion.” *Id.* at 14. The Commission is simply wrong on this point for the reasons discussed in Part III.C. *See supra* notes 176–202 and accompanying text. Narrow-based benchmarks are among the most important benchmarks we observe, and there are few securities manipulations that do not make such benchmarks their situs. Without further explanation by the Commission, it is more natural to assume that the contours of the Proposed Regulation really just reflect fixation with scandals that directly animated it. Because spot oil contracts and equity closing prices had little to do with LIBOR, the Proposed Regulation does not prioritize any sort of a principled approach to them. Whatever the appropriate treatment of benchmarks, it is unlikely that the right line is drawn so jaggedly.

ther than genuinely worrisome.²⁷¹ For the benchmarks that are regulated but not banned, it is very difficult for governments to craft rational and helpful rules governing benchmarks. There are deep problems in the Commission's proposed requirements, as described *infra*.

Notwithstanding all of these difficulties, governments cannot avoid regulating in this space, if only because they are major consumers of benchmarks.²⁷² A government's choice to use a benchmark carries an endorsement of the benchmark's suitability for use. Numerous commentators have pointed out the fact that the United States Treasury used LIBOR to make TARP loans during the financial crisis, despite being on notice that LIBOR was a manipulated benchmark.²⁷³ Treasury therefore passed up an opportunity to protect itself and warn others about emerging problems with the benchmark.

Government use (or non-use) also anchors a large network of users. Benchmarks are most useful when they are used widely.²⁷⁴ The fact that many others are using a particular benchmark is a reason to use it as well. As large users of benchmarks, responsive governments could be demanding customers, using their role as customer to improve the benchmark market without new legal strictures. Historically, governments have been rather unresponsive, ossifying the market in favor of incumbent benchmarks. Governments can and should evaluate benchmarks for their suitability of use, knowing that government adoption will have spillover effect of helping markets to coalesce around their preferred benchmark.

So how should governments influence benchmarks, whether as regulators mandating the features (and banning non-compliant benchmarks) or as users

²⁷¹ One distinctive component of the Proposed Regulation is its introduction of a "suitability" standard for the hardwiring of benchmarks, that imposes on banks a duty to select benchmarks that are suitable for their counterparties. *Proposed Regulation, supra* note 270, at 31. The Commission is clear that it is concerned that many mortgages in Spain and Italy had hardwired LIBOR as the payment rate. *Impact Assessment, supra* note 270, at 13. Yet there is no suggestion that inappropriately chosen benchmarks have harmed any identifiable constituency in any recent benchmark scandal. If LIBOR manipulation had a net effect on borrowers, it is likely to have helped them by lowering their interest rate obligations. Second, it is not obvious that LIBOR was an inappropriate benchmark even in the cases the Commission cites. LIBOR largely represents banks' cost of funds. If a different rate were imposed on mortgages, such as some sort of cost-of-living adjustment like CPI, then the variable mortgage rate would move apart from bank cost of funds. When the mortgage rate exceeded the bank's cost of funds, it would be rational for borrowers to refinance their mortgages with a fixed rate reflecting bank's current cost of funds. Non-bank-based rates would be quickly driven from the market. It may be that variable rate mortgages are *all* unsuitable for borrowers, but bank-based ones seem uniquely suitable given the that belief. Although there were clearly many problems with LIBOR, the lesson from the suitability rule is that European regulators may not be entirely technocratic in determining whether a benchmark is acceptable.

²⁷² Rauterberg & Verstein, *supra* note 56, at 148–50.

²⁷³ *TARP Urged to Drop Use of Libor*, WASH. POST, Oct. 25, 2012, at A18.

²⁷⁴ See *supra* note 252 and accompanying text.

picking terms to hardwire? The remainder of this Section is spent criticizing intuitive proposals, and contrasting them to a related and better approaches.

1. Against Objectivity

The EC Proposed Regulation calls for increased objectivity in benchmark design and operation.²⁷⁵ This approach channels fears that LIBOR, the global interest rate benchmark, was susceptible to manipulation because it was based on *hypothetical* transactions. A rate built out of only real transactions would have been robust to that sort of corruption. This approach has other proponents, such as former CFTC Chairman Gary Gensler, “To be reliable, indices have to be transaction-based and transparent.”²⁷⁶

Yet, the foreign exchange market benchmarks are almost entirely objective and transaction-based,²⁷⁷ and that market has been the locus of abuse. In the words of Gensler’s UK counterpart, Martin Wheatley manipulation in FX has been, “every bit as bad as [LIBOR].”²⁷⁸ Objectivity does not seem to have brought robustness.

Objective methodologies are blueprints to manipulators,²⁷⁹ helping them to ply their trade, and a transaction-data-only rule gives the large trader power to set the price.²⁸⁰ The use of non-transactional data (such as market participants’ perceptions of where the price is) by a benchmark provides a larger data pool, decreasing domain concentration, and it gives the index provider greater discretion to adjust for suspected manipulation. Therefore, any solution to ma-

²⁷⁵ *Proposed Regulation*, *supra* note 270, at 25–26 (“The input data shall be transaction data.”); see Daniel L. Doctoroff, Op-Ed., *A Market Alternative to Libor*, WALL ST. J., Aug. 3, 2012, at A11 (Bloomberg CEO writes: “Benchmarks such as Libor that rely on subjective assessments . . . simply cannot accurately reflect market realities.”); Hannah Kuchler, *BoE Governor Urges Reform of Libor*, FIN. TIMES, June 29, 2012, <http://www.ft.com/cms/s/0/7a76a74a-c1d2-11e1-b76a-00144feabdc0.html>, archived at <https://perma.cc/X85R-E2V9?type=pdf> (reporting that Bank of England governor believes that LIBOR should be based on actual transactions rather than estimate).

²⁷⁶ Peter Eavis & Nathaniel Popper, *Libor Scandal Shows Many Flaws in Rate-Setting*, N.Y. TIMES, July 19, 2012, <http://dealbook.nytimes.com/2012/07/19/libor-scandal-shows-many-flaws-in-rate-setting>, archived at <http://perma.cc/MM5V-NQ5D>.

²⁷⁷ See *supra* notes 97–143 and accompanying text.

²⁷⁸ *Foreign Exchange Allegations ‘as Bad as Libor’, Says Regulator*, BBC NEWS (Feb 4, 2014), <http://www.bbc.com/news/business-26041039>, archived at <http://perma.cc/E4XJ-Q6R7>.

²⁷⁹ Clear rules for acquiring and using data in any domain invites gamesmanship. OSHA inspections of workplace safety tend not to detect problems if the employer is told precisely when the inspection will occur and how it will be scored. Compare *Marshall v. Barlow’s, Inc.* 436 U.S. 307, 325 (requiring warrant and notice for inspection), with *id.* at 329–30 (Stevens, J. dissenting) (arguing that notice and delay will harm inspections).

²⁸⁰ Rosa Abrantes-Metz & David S. Evans, *Enhancing Financial Benchmarks: Comments on the OICU-IOSCO Consultation Report on Financial Benchmarks* 8 (Working Paper, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2216209, archived at <http://perma.cc/B9P4-LZ7W>.

nipulation must avoid ossifying benchmark governance within a comforting but creaking objectivity.²⁸¹

Far from mandating objectivity or transaction-primacy, governments should recognize a safe harbor for good faith mistakes by benchmark providers made in the course of trying to improve the robustness of the rate.²⁸² As it stands benchmark provider may fear regulatory reprisal if they should exclude certain suspicious data and later be found to have caused an erroneous output. They may prefer to err on the side of objectivity so that they can later avoid any culpability for the exploitation of their systems. It would be far better for benchmark providers to be granted sufficient protection to take the steps they think necessary to keep the system working best.

2. Against Transparency

The European Commission's Proposed Regulation contemplates two types of disclosure. First, it requires the benchmark provider to publish input data "immediately after publication of the benchmark except where publication would have serious adverse consequences . . ." ²⁸³ Benchmark providers have resisted calls for transparency.²⁸⁴ They fear that disclosing the data they use to

²⁸¹ See Rauterberg & Verstein, *supra* note 56, at 123–24. Indeed, even currency benchmark providers reserve for themselves the same option to *ex post* modify the output as needed to preserve credibility and accuracy. WM/Reuters allows for a myriad of supplemental data, including unexecuted bids and offers, and transactions in other currencies. See *Spot & Forward Rates Guide*, *supra* note 108, at 7, 9. On potential reforms of LIBOR, see generally Gabriel Rauterberg & Andrew Verstein, *Assessing Transnational Private Regulation of the OTC Derivatives Market: ISDA, the BBA, and the Future of Financial Reform*, 54 VA. J. INT'L L. 9 (2014); Rebecca Tabb and Joseph Grundfest, *Alternatives to Libor*, 8 CAP. MARKETS L.J. (2013). Three important policy reviews—one of LIBOR and two on indices generally—have conceded the importance of reserving a subjective quality to data presentation, acquisition, and analysis. MARTIN WHEATLEY, THE WHEATLEY REVIEW OF LIBOR: FINAL REPORT 28 (2012), available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191762/wheatley_review_libor_finalreport_280912.pdf, archived at <https://perma.cc/8DAG-JRMS?type=pdf>; BD. OF THE SEC. COMM'NS, PRINCIPLES FOR FINANCIAL BENCHMARKS, 10–11 (2013), available at <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf>, archived at <http://perma.cc/95WS-XYTX>; Brooke Masters, *Gargantuan Task of Libor Probe Becomes Clearer*, FIN. TIMES, Nov. 1, 2013, <http://www.ft.com/intl/cms/s/0/68a13d24-423b-11e3-bb85-00144feabdc0.html?siteedition=intl#axzz2jbjC9AZk>, archived at <https://perma.cc/649C-VQX4?type=pdf>. Even the EC acknowledge this at times. *Impact Assessment*, *supra* note 270, at 5–6.

²⁸² Similar concerns influence the willingness of market participants to supply data. Stewart, *supra* note 170, at 6 ("Companies faced with severe penalties for misreporting deals, and with no penalties for non-reporting of deals, have taken the easy course. The number of deals reported outside the assessment windows has declined.")

²⁸³ *Proposed Regulations*, *supra* note 270, at 30–31.

²⁸⁴ They have gone so far as to invoke journalistic privilege under the First Amendment. See, e.g., *U.S. Commodity Futures Trading Comm'n v. McGraw-Hill Cos.*, 507 F. Supp. 2d 45, 48–49, 54–55 (D.D.C. 2007) (holding that reporter's qualified privilege protected his publishing price index of natural gas from disclosing to Commodity Exchange Commission's unsolicited complaints about price manipulations); *In re Natural Gas Commodities Litig.*, 235 F.R.D. 241, 242–43 (S.D.N.Y. 2006)

compute their benchmarks will discourage market participants from sharing data with them.²⁸⁵ Hence the second kind of disclosure: At least for the most critical benchmarks, traders may be forced to disclose their trades to the benchmark provider.²⁸⁶

Voluntariness is a key element of benchmark manipulation, so if traders had to submit all their trading data to benchmark providers, or if they were only permitted to trade on exchanges that committed to compile all their trading data, the problem of strategic disclosure would be reduced.²⁸⁷ Then only outright fraud or genuinely uneconomic trades, which have always been illegal, could impact the benchmark price. And benchmark-level transparency would help detect such schemes. So is mandatory data submission and widespread disclosure a panacea? Unfortunately, numerous obstacles make this path a challenging one.

First, the benefit of submitting and aggregating data is often too low to be worthwhile. For example, it would not be cost-effective to conduct all airport kiosk currency trades through a centralized currency exchange or report them to a central data repository.

Second, many transactions are of a kind that many consider to be *legitimately* private. While we may be comfortable forcing professional traders to share their data, we may think that a farmer's crop prices are her business, or the price at which Apple exchanges currency is reasonably the concern only of Apple. The sphere of legitimate privacy may be couched in terms of incentives. Greater transparency allows freeriding by third parties, decreasing the value to the trader of having researched or—in the case of a business strategy

(holding that qualified reporter's privilege can be overcome in reporting trade data in natural gas industries publications); U.S. Commodity Futures Trading Comm'n v. McGraw-Hill Cos., 390 F. Supp. 2d 27, 30–31, 36 (D.D.C. 2005) (holding that Platts has qualified reporter privilege).

²⁸⁵ *Argus Sour Crude Index: Methodology and Specification Guide*, ARGUS MEDIA 5 (Aug. 2014), <https://media.argusmedia.com/~media/Files/PDFs/Meth/ASCI.pdf>, archived at <https://perma.cc/BA5H-CCPC>.

²⁸⁶ *Proposed Regulations*, *supra* note 270, at 29–30 (permitting mandatory contribution of data when twenty percent of critical benchmark contributors cease to contribute).

²⁸⁷ Some steps in this direction have been taken. The Dodd-Frank Act requires many swap transactions to be executed on regulated exchanges, where their data may presumably be aggregated with greater ease. Data from swaps executed off-exchange will likewise be gathered. *See* Regulation of Off-Exchange Retail Foreign Exchange Transactions and Intermediaries, 75 Fed. Reg. 55,410, 55,410 (Sept 10, 2010) (codified at 7 C.F.R. pts. 1, 3, 4, 5, 10, 140, 145, 147, 160, & 166). Equity trades conducted off of major exchanges must at least have their prices reported after the fact. Regulation NMS, 70 Fed. Reg. 37,496, 37,396 (June 29, 2005) (codified at 17 C.F.R. pts. 200–01, 230, 240, 242, 249, 270). These requirements could be broadened. At present, currency swaps and forwards are exempt from many of these requirements, but it could be otherwise. Title VII, Section 721 includes currency swaps and futures in the definition of “swap” but offers Treasury the power to exempt them, a power it exercised. Determination of Foreign Exchange Swaps and Foreign Exchange Forwards Under the Commodity Exchange Act, 77 Fed. Reg. 69,694, 69,694 (Nov. 20, 2012).

linked to trades—generated the information.²⁸⁸ Transparency can improve markets, but it comes at a cost if it discourages productive activities or some trading activities.²⁸⁹

A final consideration is that public policy is not always in favor of publicizing prices. Such prices make it easier for cartels to form.²⁹⁰ “The key challenge for a cartel is to avert secret deviations.”²⁹¹ That is, cartels must prevent their members from secretly selling at lower than the cartelized price. Mandatory and transparent benchmark participation could make it easier to detect and punish defectors, and therefore make it easier for conspirators to fix price.²⁹²

Greater disclosure of transactions is likely a public good worth developing, but it is not a costless one. A cautious and context specific approach is likely appropriate. More moderate suggestions, such as mandatory record keeping, seem like intermediate solutions that engender widespread support.²⁹³

3. Against Governance

Many benchmarks are made by entities that also use the benchmark. For example, the banks that helped create LIBOR were also the ones most likely to use it in their financial derivative contracts.²⁹⁴ The EC Proposed Regulation is suitably concerned that wearing two hats may tempt benchmark providers to

²⁸⁸ A debate therefore rages about the proper status of “dark pools”—private exchanges run by banks thought to conceal some aspects of the trading environment, such as public price quotes.

²⁸⁹ See Paul Asquith et al., *The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market*, 3–6 (NBER Working Paper No. 19417, 2013), <http://www.nber.org/papers/w19417.pdf>, archived at <https://perma.cc/J67Y-PUJS?type=pdf> (discussing costs associated with increased transparency in the bond market).

²⁹⁰ Statements from the U.S. Dep’t of Justice & F.T.C. on Antitrust Enforcement Policy in Health Care 61 (Aug. 1996) (“Purchasers can use price survey information to . . . facilitate collusion or otherwise reduce competition on prices or compensation . . .”); see *id.* at 57 (agencies will not challenge some price sharing, if information is over 3-months old).

²⁹¹ William Kovacic et al., *Averting Secret Deviations: Implications for Cartel Detection and Antitrust Compliance Training*, 2 (Apr. 2013) (preliminary draft) (available at <http://www.bateswhite.com/assets/html/documents/media.729.pdf>, archived at <http://perma.cc/UQB9-372E>).

²⁹² See generally Ian Ayres, *How Cartels Punish: A Structural Theory of Self-Enforcing Collusion*, 87 COLUM. L. REV. 295 (1987) (examining the ability of collusive market participants to punish each other for breaching cartel agreements).

²⁹³ BD. OF THE INT’L ORG. OF SEC. COMM’NS, *supra* note 68, at 14; *Proposed Regulation*, *supra* note 270, at 49. Of course, it remains to ask “what is record keeping?” It is one thing to ban the destruction of transactional data that might indicate strategic behavior, it is quite another to, say, affix a narrative explanation justifying each trade or data submission a firm makes.

²⁹⁴ If anything, the benchmark market has become *more* conflicted despite widespread awareness of LIBOR problems. See, e.g., Chris Flood, *LSE Deal Heralds Indexing Overhaul*, FIN. TIMES, June 29, 2014, <http://www.ft.com/intl/cms/s/0/d062650e-fc45-11e3-98b8-00144feab7de.html#axzz3GMvwct14>, archived at <https://perma.cc/U7VV-APCK?type=pdf> (discussing purchase of major index provider by a stock exchange represents greater conglomeration, of the sort described in Rauterberg & Verstein, *supra* note 56).

favor themselves at the margins.²⁹⁵ The EC program involves limiting conflicts and requiring certain governance systems for the conflicts that remain.

This is an invasive and costly approach. It is strange that the European Commission did not ask why benchmark providers would not themselves choose to use the best governance techniques. Surely if they wished to control conflicts, perhaps at the behest of their customers, they could do a better job than any administratively prescribed compliance program. Where benchmark providers' incentives have been aligned with their users, good practices have generally resulted.²⁹⁶

Other scholarly work has extensively charted the market forces that encourage better benchmark governance, so it will be appropriate to only revisit those findings.²⁹⁷ At present, many benchmarks are produced as a byproduct, or in service, of some other primary business activity. This structure tends to discourage competition and investments in quality. By contrast, if benchmark providers understand that they are compensated for providing excellent benchmarks, they will have a better incentive to secure representative data, and to seek out more customers by competing with inadequate benchmarks. Finding profitable inducements for benchmarks, rather than solely new burdens, might help stop the apparent flight from benchmark production that we now observe.²⁹⁸

CONCLUSION

This Article began by noting a seeming dissonance between the scholarly view of manipulation and the empirical reality. This dissonance reflected the fact that most scholarly engagement is an accurate discussion of price manipu-

²⁹⁵ See *Proposed Regulations*, *supra* note 270, at 7 (“[A]ll administrators [of benchmarks] are potentially subject to conflicts of interest . . . [and thus] need to be subject to appropriate regulation.”) This Article has not focused on the tendency of benchmark providers to facilitate or initiate manipulation. For other work focusing on this source of problems, see generally Rauterberg & Verstein, *supra* note 56.

²⁹⁶ Some are skeptical, however, that aligning incentives is part of a comprehensive solution. Bart Chilton, Comm’r, Commodity Futures Trading Comm’n, Statement of Commissioner Bart Chilton Before the International Roundtable on Financial Benchmarks (Feb. 26, 2013) (transcript available at <http://www.cftc.gov/PressRoom/SpeechesTestimony/chiltonstatement022613>, archived at <http://perma.cc/BD4N-ZBMZ>) (“Finally, these benchmarks need to be . . . not in the control of any individual or entity which may have a profit motive. That means government; quasi-government or an appropriate not-for-profit entity should oversee the circumstances surrounding how marks are established.”).

²⁹⁷ See Rauterberg & Verstein, *supra* note 56, at 150–59.

²⁹⁸ The silver fix, a major benchmark, will disappear because participants feared compliance and liability and saw little advantage to offset it. Nicolas Larkin, *Silver Fixing Company to Stop Ruining London Benchmark*, BLOOMBERG (May 14, 2014), <http://www.bloomberg.com/news/2014-05-14/silver-fixing-company-will-stop-running-benchmark-on-aug-14.html>, archived at <https://perma.cc/E8SB-GJU6?type=source>.

lation, although the world is rife with price benchmark manipulation. Price benchmark manipulation is rife because of our rational and widespread dependence upon benchmarks that are inherently susceptible to influence. This dependence and susceptibility was explored in the case foreign currency, crude oil, and equity securities. In light of their utility, it makes sense to save our benchmarks through appropriate legal interventions. This means reversing an erroneous obsession with fraud in our market abuse doctrine, and striking out a new path into a jurisprudence of price reports; it also means avoiding stifling and ill-conceived regulation of the benchmark sector.

Having explored many of the major features and challenges of benchmark manipulation, numerous puzzles nevertheless remain for future research. Defining “manipulation” has proven a perennial difficulty among scholars of manipulation, and this difficulty expresses itself in the context of benchmark manipulation as well. It is appropriate to prohibit manipulatively selective trading data to benchmarks, but we are reluctant to force all trading into the sunlight. In the absence of requirements of universal transparency, we depend on voluntary disclosures and should be unsurprised if such disclosures are less common where they would injure the trader than when they help. Is there a principle by which good submission practices can be easily distinguished from bad? Or is there a structural solution, some redesign of market structure, that would render manipulation less harmful? These remain questions for further inquiry.

After calling currency benchmark manipulation the “biggest series of quantifiable wrongdoing in the history of our financial services industry,”²⁹⁹ Martin Wheatley, head of Britain’s chief market regulator noted that the manipulation was a “surprise for all of us.”³⁰⁰ With the insight of this article, manipulation need not come as much of a surprise. At present it is no surprise because our market relies on vulnerable structures and our law does little to support them. Yet it is conceivable that benchmark manipulation could become rare and unmemorable again. It would be a relief to return to an era of plain old fraud.

²⁹⁹ Martens, *supra* note 101.

³⁰⁰ *Id.*