

Defining Market Manipulation in a Post-REMIT World

By Shaun Ledgerwood, Dan Harris, Bin Zhou and Pinar Bagci¹

Contents

Introduction

Section 1

A Framework for Analysing Market Manipulation.....2

Section 2

Examples of Loss-Based Market Manipulation.....4

Section 3

Application of the Proposed Framework.....6

Conclusion

The Brattle Group provides consulting and expert testimony in economics, finance and regulation to corporations, law firms and governments around the world.

We have offices in Brussels, London and Madrid. We also have offices in Cambridge, MA; San Francisco, CA; and Washington, DC.

For more information, please visit www.brattle.com.

Market manipulation and fraud can undermine confidence in markets, but spurious prosecutions of legitimate hedging and trading strategies, and confusion about what is permitted, could be equally damaging. A clear and workable definition of market manipulation is vital to the continuing success of Europe's energy trading markets. The draft REMIT Proposal issued by the European Commission highlights the need for a clear definition of the behaviour that constitutes manipulation in these markets.

In this discussion paper, we define a form of market manipulation that is of key concern in energy markets: intentionally losing money on price-making trades to benefit the value of related price-taking positions. Such 'loss-based' manipulations can be executed without possessing or exercising market power. Traders can purposely place loss-making trades to move index prices to increase the value of leveraged physical or financial derivatives positions.

We propose a simple framework to detect and analyse these and other forms of manipulation. Application of this framework would reduce the uncertainty and burden for enforcement agencies and the internal compliance divisions of market participants. Its application would also improve market efficiency and liquidity by providing a clear framework for evaluating manipulative behaviour that is uniform across cases, agencies and statutes.

Introduction

In December 2010, the European Commission proposed a Regulation on Energy Market Integrity and Transparency (the 'REMIT Proposal').² Among other things, REMIT seeks to expand the scope of the European Union's primary anti-manipulation and market abuse legislation, the Market Abuse Directive (MAD), to cover wholesale energy products.³ The draft REMIT Proposal prohibits, in particular, actual or attempted manipulation based on three elements:

- (1) dissemination of information that gives, or is likely to give, 'false or misleading signals' as to the supply, demand or price of wholesale energy products;
- (2) the procurement of energy products priced at an 'abnormal or artificial level,' unless the trades are 'legitimate and that these transactions or orders to trade conform to accepted market practices;' and
- (3) the employment of or attempt to employ 'fictitious devices or any other form of deception or contrivance.'⁴

Provision (2) can be characterised as an 'artificial price' standard, while provisions (1) and (3) are 'fraud-based' standards.

The views expressed in this paper are strictly those of the authors and do not necessarily state or reflect the views of The Brattle Group, Inc. or its clients.

Defining Market Manipulation in a Post-REMIT World

From an enforcement perspective, it is desirable to have multiple options for stopping and prosecuting manipulative behaviour. However, there are many practical questions that must be addressed: How can we determine what an 'artificial' price level is in the volatile world of energy commodity markets? Is a standard based on artificial prices desirable given the public lament expressed in the United States concerning the difficulty of prosecuting cases using this standard?⁵ When is a trade considered 'legitimate' and what market standard will guide the test for legitimacy? If behaviour is legitimate under the artificial price provision, does that mean that the behaviour cannot be pursued under the other (fraud-based) REMIT provisions? How does a regulator screen for behaviour that violates any (or all) of these rules, without falsely identifying legitimate behaviour?

The REMIT Proposal implicitly recognises these uncertainties and notes that such concerns should be addressed by a 'delegated act' of the Commission. In other words, the Commission will develop detailed rules describing what these and other terms in the proposal mean.⁶ The European Economic and Social Committee (EESC) also notes that 'the definitions set out in Article 2 [of the REMIT Proposal, which describes market manipulation] are overly vague for a regulation.'⁷ The details of these delegated acts will be crucial to how REMIT works in practice, and how it governs the behaviour of traders in wholesale energy markets. The current text of REMIT provides little guidance or clarity as to the kinds of behaviour that would be regarded as market manipulation.

The problem is not just confined to the draft REMIT text. US statutes and regulations also fail to define terms clearly, and academics and other commentators often use and apply the terms in an imprecise manner.⁸ Case precedent has been spotty and provides little specificity as to the types of behaviour that are illegal under these standards. These factors have led to an 'I know it when I see it'⁹ view of manipulation that provides little solace to traders seeking to act without running afoul of the manipulation laws. Inconsistent precedent also makes the enforcement of anti-manipulation laws more difficult, creating a patchwork of traps and loopholes that could potentially excuse patently manipulative behaviour. As the few enforcement actions and anecdotal examples of loss-based manipulations in the US and Europe demonstrate,¹⁰ prosecutions are seldom successful, due in part to the uncertainty surrounding the prohibited behaviour.

Such confusion over the definition of market manipulation could be damaging. Uncertainty as to acceptable behaviour could hamper enforcement efforts by increasing the difficulty of prosecuting manipulations while simultaneously reducing the ability of market participants to comply with the rules. This lack of clarity could also reduce liquidity, diminishing market efficiency and making market conditions more favourable to subsequent gaming. A clear definition of manipulation, combined with a consistent framework that can be used to analyse manipulative behaviour, could address these issues.

In this paper, we describe a practical and intuitive definition of loss-based manipulative behaviour: **intentionally losing money on transactions that set (or make) a price to benefit the value of related positions that tie to (or take) that price.** This definition is supported by a straightforward framework that demonstrates the mechanics of how a market manipulation can be defined, analysed, detected or refuted. The framework provides traders and regulatory authorities with a means to clearly and objectively distinguish between manipulative behaviour and legitimate trading strategies.¹¹ If adopted, this definition could unify enforcement efforts in both the EU and the United States.

Section 1 A FRAMEWORK FOR ANALYSING MARKET MANIPULATION

The definition of 'loss-based manipulation' we propose is specifically designed to address the type of manipulation that is most concerning for energy markets due to their heavy reliance on indices for setting the prices of the underlying commodity. For example, every recent energy market manipulation case brought in the United States has involved a loss-based manipulation.¹² However, the framework we developed from this definition has broader applications to all manipulations, including:

Defining Market Manipulation in a Post-REMIT World

Manipulations triggered by 'outright fraud.' The fraud induces others, not the manipulator, to make the losing trades that trigger the manipulation. In the United States, these cases are usually brought by the Securities and Exchange Commission (SEC) and are typically much easier to catch because the people who were directly injured by the fraud will seek redress.

Manipulations enabled by a market power abuse. Suppose a monopolist electric utility allows a competitive price in its market and buys derivatives that benefit from a higher price. The monopolist then withholds available generation from the market to raise the price to supra-competitive levels, simultaneously maximising its profits and manipulating the derivatives. This is not a 'loss-based manipulation' because the price increase was profit maximising to the monopolist on a stand-alone basis (i.e., there is no loss).¹³ However, price-making trades were used to benefit the value of the related (price-taking) derivatives positions, indicative of a manipulation.

The framework we propose covers all of these circumstances, as separation of the manipulation's price-making trigger (uneconomic trading, induced losses or market power) and price-taking target (physical or financial positions) is always required. That said, within the context of energy markets, the loss-based manipulation concept is far more relevant, due to the reliance of those markets on indices for price information, temporary fixities in demand and supply and the ability to leverage large financial derivatives positions that tie to the price of the underlying commodity.

The framework for proof associated with our definition of manipulation is straightforward:

- (1) *prove the actor lost money on price-making transactions;*
- (2) *prove that this loss was intended to move a price and was not incurred accidentally or for a legitimate business purpose; and*
- (3) *prove that the loss benefitted the value of the actor's price-taking positions that tie to the targeted price.*

Our manipulation framework is supported by microeconomic theory.¹⁴ The ability to manipulate a market is shown to increase as (1) the market used to trigger the manipulation becomes less liquid or prone to episodes of inelastic supply and/or demand, and (2) as the size of the leveraged position targeted by the manipulation grows. These characteristics are especially present in energy markets, where episodic supply and demand constraints occur regularly, prices often reference indices that may not be liquid and leverage can be built through accumulating large leveraged positions.

The framework's value is its focus on the transactions that make prices. Because not all price-taking positions are observable, regulators can preserve resources by focusing the screens for manipulative behaviour on price-making transactions, looking for evidence of intentional uneconomic behaviour.¹⁵ If evidence of anomalous losses on price-making trades is discovered, and those losses are shown to serve no legitimate business purpose but to enhance the value of other positions held by the trader, a manipulation can be proven if a link exists between the losing trades that triggered the manipulation and the price-taking positions that were the manipulation's target.

As we discuss further below, this framework is consistent with all three of the manipulation standards presented in the REMIT Proposal. This is because proof of these elements satisfies the requirements of the two 'fraud-based' standards for an actual or attempted manipulation, as well as the 'artificial price' standard regarding attempted manipulation. Proof of actual manipulation under the artificial price standard requires an additional step to calculate the difference between the artificial price and the 'but for' competitive price. This is also required for proof of damages from the manipulation (as in the case of private actions to redress harm from the manipulation), and can be used to provide proof that the behaviour in question was intentional.

Defining Market Manipulation in a Post-REMIT World

Section 2 EXAMPLES OF LOSS-BASED MARKET MANIPULATION

A simple example of a loss-based market manipulator is a pool hustler. Hustlers execute their 'market manipulations' by losing money up front to bait their marks into playing for a much higher wager in a subsequent game. If the hustle succeeds, the mark accepts the higher wager and is then beaten by a deceptive and superior opponent. This paradigm is duplicated in other types of loss-based manipulations, where a loss is intentionally incurred to trigger a result that leads to a greater gain in some targeted outcome that is related to the triggering event.

Another example of this strategy is described in the sidebar 'Manipulation of an Apartment Market,' wherein a real estate index is used to manipulate a market for apartments. This example is particularly relevant to energy markets, which rely heavily upon indices for pricing information and allow potential manipulators ready access to leveraged price-taking positions through the availability of financial derivatives. The example also demonstrates that loss-based manipulations require no market power to execute.

Regulators in the United States have prosecuted several enforcement actions for loss-based manipulations in energy markets. A well-known example is the Federal Energy Regulatory Commission's (FERC) case against Amaranth Advisors, L.L.C. and one of its energy traders, Brian Hunter.¹⁶ In this case, Hunter was shown to have accumulated a large quantity of NYMEX natural gas futures contracts, which obliged him to buy gas at some future time. The price at which such contracts are settled is determined by futures contract trades during a defined period of trading known as the 'settlement' or 'fixing period.'

Because the US gas market is highly liquid with many sophisticated participants, concerns of manipulation were deemed absurd. However, Hunter was shown to have sold his physical positions at a loss during the fixing period, which set the price for gas futures contracts. This lowered the index price to the benefit of Hunter's large financial derivatives positions. Similar loss-based manipulations were alleged by the US Commodity Futures Trading Commission (CFTC) in the markets for electricity in the DiPlacido case and the market for oil in the recently filed case against Parnon Energy and others.¹⁷

One last example ties the loss-based manipulation concept specifically to the REMIT Proposal and demonstrates that the perceived legitimacy of a transaction may bar enforcement under both the artificial price and fraud-based standards. Suppose an LNG ship is approaching the United Kingdom, but five days before arrival, the ship gets diverted to the United States. Suppose also that the diversion decision is made by someone who trades gas actively in the UK, and is net long on gas. After the diversion, UK market prices rise, because the market had anticipated the arrival of the LNG ship that will now go to the US. This raises several possible theories for manipulation, including:

- ◆ *the original scheduling of the tanker was meant to suppress UK gas prices, such that the intentional diversion might be viewed as a 'false or misleading' signal of incoming gas supply;*
- ◆ *the diversion of the tanker purposely reduced available supply, thus securing an artificially high price to make the trader's long position more profitable as a result of the diversion; or*
- ◆ *the entirety of the manipulative scheme represents a 'fictitious device' or 'other form of deception or contrivance' exploiting the characteristics of the market.*

This example raises two significant questions. First, was the decision to divert the tanker made for a legitimate business purpose? Second, was the diversion performed at a loss to the alleged manipulator, suggesting a loss-based manipulation? If the decision to divert the tanker was the most profitable option available to the trader on a stand-alone basis (e.g., if the US gas price exceeded the UK price post-diversion), the diversion was a profit maximising strategy that also served a stand-alone legitimate business purpose.

MANIPULATION OF AN APARTMENT MARKET

Assume that two bedroom apartments are currently selling for around €500,000, as measured by a website index that tracks comparable sales over a rolling 30-day period. There are many units for sale, all similar in size and appearance, and all offered at prices around €500,000. If you owned a similar apartment and wanted to sell it at a price *above* market (€700,000, for instance), you would be unlikely to have a successful sale. This is because your ability to raise the price significantly above the competitive price is constrained by the other sellers in the market, a hallmark of effective competition and a check on market power.

Compare this to a scenario where you offered your apartment for a price *significantly below* market (€100,000, for example). Such an offer would be immediately snapped up, the buyer walking away with a windfall while you incur a loss (relative to your opportunity cost) of around €400,000. This demonstrates a point essential to understanding a loss-based manipulation: the further you are willing to drop your offer below the competitive market price, the greater the likelihood that you will effectively face no competition whatsoever for your offer from other sellers. The same principle will hold for buyers

that bid at prices above the competitive equilibrium, underscoring the point that market participants do not need market power to successfully execute trades (and therefore post prices) in a manner that injures their stand-alone self-interest.

These uneconomic trades can enable the execution of a manipulation. Suppose that you are actually a property developer who is looking to acquire a significant number of apartments in this market. Assume further that the €100,000 sale of your apartment lowers the average (index) value of apartments sold to €480,000. If other sellers rely upon the index price for evaluating the market value of their apartments, they will lower their prices in response. You then buy 25 apartments for €480,000 each, with each purchase made at the index price (i.e., as a price taker). By willingly taking a loss of €400,000 on your initial sale, which in turn tanked the index, you saved €500,000 (€20,000 each) across the 25 apartments that you ultimately purchased, netting yourself a €100,000 gain. By our proposed definition, this is a market manipulation because a price-setting transaction was intentionally used for the sole purpose to benefit a price-taking position.

In such a case, the legitimacy of the transaction bars an action under the artificial price standard of the REMIT Proposal. But what about an enforcement action based on a fraud-based theory? Without the ability to demonstrate clearly that the diversion occurred at a loss, the likelihood of proving that it was executed fraudulently is *de minimus*.

That the manipulator assumes risk to assemble the pieces of the manipulation does not exonerate the behaviour. For example, if a manipulation requires its trader to incur losses to trigger the manipulation in advance of receiving the benefit to its targeted position, the manipulator accepts considerable risk. In the pool example, the hustler's mark could leave before the scam is completed, or the mark could itself be a shark seeking to bait the hustler into a high wager game. Similarly, the apartment manipulator in the sidebar could face an unexpectedly large increase in the liquidity of the index such that the impact of its trigger is muted. Additionally, scarcity could emerge during its purchasing binge, which would result in trades at premiums to the index that erode the profitability of its manipulation.

Derivative manipulators also take considerable risk in establishing their positions, evidenced by the ultimate demise of Amaranth. However, the economic framework we propose explains all such behaviour as the rational act of profit maximisation across a portfolio of transactions, with some trades resulting in losses and providing false information as to the value of the item traded to benefit other price-taking positions. This ultimately results in a decrease in market efficiency. The framework is equally applicable whether the loss occurs before, during or after the gain.¹⁸

Section 3 APPLICATION OF THE PROPOSED FRAMEWORK

The definition of loss-based manipulation and the associated economic framework we propose both operate on the principle that a manipulator strategically incurs losses to cause a price movement that benefits its broader portfolio, thus committing *transactional fraud*. Thus, the two fraud-based provisions of the REMIT Proposal directly apply to loss-based manipulations as they would to manipulations caused by outright fraud (such as false reporting). Likewise, while the exercise of market power does not constitute market manipulation under our definition, the ability to exercise market power can assist a market manipulation.

In all such cases, our framework is applicable, as it identifies that the main precursor for the ability to successfully manipulate markets relies on the ability of the manipulator to cause price movements that affect linked asset values. The fraud manifests itself through the manipulator's willingness to impose losses on other market traders in the price-making market (through the introduction of an uneconomic price), and on the counterparties of the price-taking instruments (assuming their positions were taken without knowledge of the manipulation to come).

Our framework supports equivalent legal and economic analyses under either 'fraud-based' or 'artificial price' anti-manipulation standards, as the same transactions that misrepresent the value of the underlying commodity are also responsible for creating the artificial price. Thus, the analysis of manipulation is functionally identical under both standards, with the proof of a specific artificial price needed only to evaluate the damages caused to private parties.

The skew in asset values that results from a manipulation can linger well beyond the time frame of its execution. Consider the aftermath of the apartment market example. After the manipulator is finished, a total of 45 transactions will have been posted to the index to reinforce the market price €20,000 below the price *before* the manipulation. While these transactions will ultimately fall off the index, the sales that replace them will face the implied presumption that the established average price is a factual representation of fair value, causing the wealth transfer to continue to pass from sellers to buyers as long as the effect persists. This is also true across discrete clearing periods, such as during settlements arising from one hour to the next or across fixing periods. If the misinformation carries over from one period to the next, the fraud may continue to distort valuations and lead to protracted market inefficiencies.

While the application of our definition is straightforward, the issue of legitimacy must always be considered. Hedging, risk management practices and complex trading strategies involving multiple instruments complicate the picture. Hedging necessarily involves investments designed to gain precisely when losses would be expected in other positions exposed to a particular risk.¹⁹ Under enterprise-wide portfolio risk management, transactions may be executed not to hedge any specific position, but rather to balance exposure to certain kinds of losses seen in the overall portfolio of holdings. Such transactions may occur as commodity contracts approach expiration and may even be implemented through computerised trading programs executed without human intervention. Transactions involving losses in specific markets may also be driven by factors such as credit or the desire to prevent further losses.

Market participants also often enter into simultaneous transactions in related products to arbitrage the perceived spreads between locations or instruments (cash versus financial, futures versus swaps, etc.). A misapplication of our definition of loss-based market manipulation could have serious ramifications for investment professionals who often pursue complicated trading strategies that are likely to affect market prices. Given the uncertainty in commodity markets, such activities may clearly reflect legitimate business purposes at the time they are executed, yet *ex post* analysis could snare them in screens seeking trading patterns consistent with manipulation. Screens for manipulative behaviour must therefore be carefully crafted and applied, and enforcement actions should only proceed when evidence of manipulative intent seems clear.

Conclusion

Toward a More Definitive Process for Evaluating Market Manipulation Cases

The three anti-manipulation provisions of the REMIT Proposal cast a broad net concerning the types of behaviour that the European Commission seeks to prevent. However, the absence of detail in these standards raises concerns about the direction enforcement rules may take. Because market manipulation is a phenomenon that is difficult to describe comprehensively, it is imperative that the rules ultimately adopted clearly define the behaviour that will be deemed suspicious or considered manipulative. This certainty will serve the needs of the regulatory bodies, whose scarce resources will be taxed in screening for such behaviour and bringing enforcement actions if manipulative behaviour is found. It will also serve the needs of the trading community, as certainty of the compliance requirements will encourage legitimate trading. This will improve the liquidity of the markets over time, thus reducing the probability that a loss-based manipulation can successfully occur.

The REMIT Proposal's provisions are functionally equivalent to those adopted by regulators with anti-manipulation authority in the United States: the CFTC (futures and derivatives), FERC (natural gas and electricity at wholesale), the Federal Trade Commission (oil), and the SEC (equities). Subsequent to the passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act,²⁰ all four of these agencies now have fraud-based manipulation statutes similar to the 'fictitious devices or any other form of deception or contrivance' provision of the REMIT Proposal. The CFTC also has an artificial price provision that pre-dates Dodd-Frank.

The congruity of these statutes with the provisions of the REMIT Proposal presents an opportunity to create a uniform and coordinated multi-agency and multi-national enforcement network that minimises regulatory arbitrage and provides certainty to market participants as to the behaviour that is prohibited. However, the lack of a viable definition of manipulative behaviour will frustrate such potential efficiencies, thus perpetuating the 'I know it when I see it' approach to manipulation analysis.

The definition of market manipulation and associated economic framework we propose will help clarify the analysis of market manipulation across cases and can assist the coordination of global anti-manipulation efforts. If adopted, it would provide market participants with greater certainty concerning behaviour considered legitimate under the statutes, and would likewise provide regulatory agencies with a clearer mandate as to the types of behaviour that merit intervention. Reduced uncertainty should improve compliance, maximise the impact of limited enforcement resources and increase market participation and liquidity.

Defining Market Manipulation in a Post-REMIT World

Endnotes

- ¹ The authors wish to express their gratitude to *Brattle* principals Johannes Pfeifenberger and Gary Taylor for their assistance in writing this paper.
- ² *Proposal for a Regulation of the European Parliament and of the Council on energy market integrity and transparency* (REMIT Proposal), Brussels, 8.12.2010 COM(2010) 726 final 2010/0363 (COD).
- ³ The REMIT Proposal (Article 2(4)) defines wholesale energy products as: (a) contracts for the supply of natural gas or electricity; (b) derivatives relating to natural gas or electricity; (c) contracts relating to the transportation of natural gas or electricity; and (d) derivatives relating to the transportation of natural gas or electricity irrespective of where and how they are traded. MAD currently only applies to financial instruments.
- ⁴ REMIT Proposal, pages 11-12.
- ⁵ Bart Chilton, Commissioner of the US Commodity Futures Trading Commission (CFTC), stated in remarks made on 23 March 2010 to the Metals Market Investors group in Washington, DC, '... in 35 years, there has been only one successful prosecution for manipulation' by the CFTC under its 'artificial price' test.
- ⁶ The European Parliament and the European Council are expected to discuss the final REMIT text in June 2011, with the European Parliament's Energy Committee voting on a revised text in July and a final vote passing the directive into European law in September. The text of the delegated acts, however, may emerge only after the final vote.
- ⁷ *Opinion of the European Economic and Social Committee on the Proposal for a regulation of the European Parliament and of the Council on energy market integrity and transparency*, COM(2010) 726 final, ¶5.1, page 7.
- ⁸ For discussion, see Ledgerwood and Carpenter, *A Framework for Analyzing Market Manipulation*, April 2011. Available at SSRN: <http://ssrn.com/abstract=1811764>.
- ⁹ Justice Potter Stephens, *Jacobellis v. Ohio*, 378 U.S. 184 (1964).
- ¹⁰ See the discussion concerning *Amaranth* in Section 2. See also Russell, "Day trader who exploited City Index spread betting 'loophole' fined £700,000," *The Telegraph*, 15 June 2011. Available at: <http://www.telegraph.co.uk/finance/newsbysector/banksandfinance/8575868/Day-trader-who-exploited-City-Index-spread-betting-loophole-fined-700000.html>.
- ¹¹ We proposed this test in comments filed with the Commodity Futures Trading Commission in their Market Manipulation docket. These are available at: <http://comments.cftc.gov/PublicComments/ViewComment.aspx?id=26909&SearchText=>.
- ¹² See *In Re Amaranth Advisors, L.L.C. et al.: Order to Show Cause and Notice of Proposed Penalties*, Docket No. IN07-26-000 (2007) (trader found guilty of loss-based manipulation of NYMEX NG contract); *In Re Energy Transfer Partners, L.P. et al: Order to Show Cause and Notice of Proposed Penalties*, Docket No. IN06-3-002 (2007) (company alleged to have placed uneconomic natural gas trades to benefit physical and financial positions at the Houston Ship Channel); *DiPlacido v. CFTC*, 2009 U.S. App. LEXIS 22692 (2d Cir. 2009) (electricity trader found guilty of manipulating NYMEX electricity markets through uneconomic trading); and *Commodity Futures Trading Commission v. Parnon Energy, Inc., Arcadia Petroleum LTD., Arcadia Energy (Suisse) SA, Nicholas J. Wildgoose and James T. Dyer* (S.D. N.Y. 2011) (alleged manipulation of NYMEX through the use of uneconomic physical trading to influence the West Texas Intermediate index).
- ¹³ This provides an excellent example for distinguishing an antitrust violation from a market manipulation. The act of economic withholding by the monopolist incurs a loss on its withheld generation to benefit the remainder of its portfolio through a higher price. While this seems like a loss-based manipulation, it is not because the totality of the manipulation 'trigger' benefits the manipulator on a stand-alone basis. This difference is evident in the manipulator's use of market output as a trigger; whereas a loss-based manipulation relies upon a seller oversupplying the market, the use of market power involves the withholding of output. This describes an antitrust issue, not a market manipulation. The (price-taking) derivatives position then adds the market manipulation element to the example.
- ¹⁴ See *Framework*, endnote 8, *supra*; Ledgerwood, *Screens for the Detection of Manipulative Intent*, December 2010. Available at SSRN: <http://ssrn.com/abstract=1728473>.
- ¹⁵ *Id.*, pages 41-53. This paper proposes and describes in detail five screens that can be (and have been) used to further advance the detection of manipulative behaviour.
- ¹⁶ See *Order to Show Cause and Notice of Proposed Penalties*, Docket No. IN07-26-000 (2007); *Initial Decision* in Docket No. IN07-26-004, 130 FERC ¶ 63,004 (2010); *Order Affirming Initial Decision and Ordering Payment of Civil Penalty* in Docket No. IN07-26-004, 135 FERC ¶ 61,054 (2011).
- ¹⁷ See *DiPlacido v. CFTC*, *op. cit.*, and *CFTC v. Parnon Energy, Inc. et al.*, *op. cit.*
- ¹⁸ The pool hustler and apartment examples show a loss incurred in advance of the manipulator's gains. However, manipulations can also be triggered by losses incurred contemporaneously with or subsequent to gains in the targeted related positions. The tanker example provides a case of contemporaneous recovery, such that the trader receives an immediate boost in the value of its long gas position when the tanker is diverted, as does the manipulation of financial derivatives positions through the execution of uneconomic trading during the fixing period of the price of the underlying commodity. Compare this to a market 'corner' and 'squeeze' wherein the manipulator makes large price-making purchases to create a shortage on the front end of the manipulation to artificially raise prices, then profits by selling as a price-taker to the inflated prices, ultimately causing the market price to collapse. When the price falls below the purchase cost of some units the manipulator paid to initiate the scheme, the manipulator loses money on whatever units it holds at the end of the manipulation.
- ¹⁹ In the perfectly implemented hedge, gains and losses match exactly. In the real world, however, hedges may over or undershoot, resulting in gains or losses.
- ²⁰ P.L. No: 111-203 (2010).

Defining Market Manipulation in a Post-REMIT World

About the Authors**Shaun Ledgerwood**
Senior Consultant**Phone:** +1.202.955.5050
Email: Shaun.Ledgerwood@brattle.com

Dr Ledgerwood specialises in issues of market competitiveness with an emphasis on the economic analysis of manipulation in commodities markets. He formerly served as an economist and attorney for the FERC, during which time he led the agency's pilot project for energy market surveillance. His consulting practice specialises in the analysis of market power in energy and other regulated and non-regulated markets; issues pertinent to economic regulation, ratemaking, power supply, resource planning and electric asset valuations; and the computation of damages pursuant to actions in tort or contract.

Dr Ledgerwood received his Ph.D. and M.A. in Economics from the University of Oklahoma, and his J.D. from the University of Texas (Austin).

**Dan Harris**
Principal**Phone:** +39.06.7720.1414
Email: Dan.Harris@brattle.co.uk

Mr Harris is an expert in the economics of gas and electricity markets around the world. He has been involved in client engagements across the full spectrum of the industry and his clients include energy regulators, competition authorities, gas and electricity network companies, gas buyers and sellers and electricity generators. He has contributed key analyses to some of the largest proposed energy mergers of recent times, assisted in estimating damages for several international arbitrations and advised on cost of capital issues in regulatory proceedings.

Mr Harris received his M.Sc. in Economics from the London School of Economics.

**Bin Zhou**
Senior Consultant**Phone:** +1.617.864.7900
Email: Bin.Zhou@brattle.com

Dr Zhou has over ten years of consulting experience in the finance (banking and insurance), energy and telecommunications industries. He specialises in the application of finance, accounting and taxation principles in a variety of consulting and litigation settings. His recent experience also includes evaluating a failed hedge fund's investment management and hedging strategies, analysing economic substance of leasing transactions and investigating the impact of a proposed tax on affiliate offshore reinsurance.

Dr Zhou received his Ph.D. in International Economics from Brandeis University.

Pinar Bagci
Senior Consultant**Phone:** +44.20.7406.7900
Email: Pinar.Bagci@brattle.com

Dr Bagci is an economist with over 15 years of experience advising clients on regulatory and competition matters. Her core expertise is in the economics of financial and energy markets. She has advised on these matters in connection with competition investigations, regulatory matters and mergers. Her clients include some of Europe's most prominent companies and banks, as well as regulators, governments and international institutions.

Dr Bagci received her M. Phil and Ph.D. in Economics from Cambridge University.

The Brattle Group

ECONOMIC AND FINANCIAL EXPERTS

CAMBRIDGE

SAN FRANCISCO

WASHINGTON

BRUSSELS

LONDON

MADRID

www.brattle.com