

The Impact of Storage and Delivery Infrastructure on Commodity Derivatives Market Pricing

Final Report

**The Board
OF THE
INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS**

FR03/2016	MAY 2016
------------------	-----------------

Copies of publications are available from:
The International Organization of Securities Commissions website www.iosco.org
© *International Organization of Securities Commissions 2016. All rights reserved. Brief
excerpts may be reproduced or translated provided the source is stated.*

Contents

Glossary		iv
Chapter 1	Introduction	1
1.1.	Background	1
1.2	The importance of storage and delivery infrastructure	2
1.3	Issues with the current regulatory structure	5
1.4	Report Structure	5
Chapter 2	Regulatory Issues	7
2.1	Types of delivery mechanisms and duration of storage/load out	8
2.2	Transparency	9
2.3	Legal	10
2.4	Cross-border issues	10
2.5	Relationship to physical market	11
2.6	Oversight	11
2.7	Contract design	12
2.8	Co-operation arrangements	13
Chapter 3	Operational Issues	14
3.1	Interactions between market infrastructures	15
3.2	Segregation and fungibility	15
3.3	Rent/storage fees	16
3.4	Load-out rates	17
3.5	Premiums	17
Chapter 4	Governance and Conflicts of Interest	19
Chapter 5	Information access	22
Chapter 6	Conclusions	24
Annex	Contract Design Principles	27

Glossary of Terms

Many of the terms contained in this Glossary are either defined by an IOSCO member's regulation or are accepted terminology that has unique meanings, which have developed in a particular jurisdiction's markets. Therefore the definitions that follow are intended to be generally descriptive, providing clarity to the interpretation of this document, but are not intended to be legally authoritative for any jurisdiction or market.

Arbitrageur – A market participant who tries to take advantage of price inefficiencies by making offsetting trades in different products or markets, profiting from price differences.

Basis – The difference between the cash price of the underlying physical commodity and the trading price of a commodity derivatives contract (grain markets). See also *Premium*.

Physical market – A market for buying or selling physical commodities for cash payment and immediate delivery, sometimes referred to as the cash market.

Commodity Futures Contract – A derivative that is listed by a regulated derivatives exchange that is an agreement to purchase or sell a commodity for delivery in the future: (1) at a price that is determined at initiation of the contract; (2) that obligates each party to the contract to fulfil the contract at the specified price; (3) that is used to assume or shift price risk; (4) that is cleared through a central counterparty; and (5) that may be satisfied by delivery or cash settlement, or may be offset prior to delivery.

Deliverable Supply – The total available supply of a commodity that meets the delivery specifications of a derivatives contract.

Delivery Instrument – A document or electronic entitlement such as a warrant, warehouse receipt or shipping certificate which represents, and may be exchanged for, the underlying asset in a derivative market transaction.

Hedging – The taking of a position in a commodity derivatives contract opposite to a position held in the physical market to minimize the risk of financial or economic loss from an adverse price change, or otherwise for risk management purposes.

Load-in/Load-out Rates – The rate at which the underlying asset of the commodity derivatives contract is delivered into or out of the storage facility.

Load-out – The process of discharging the underlying commodity from the RSI.

Physical Delivery – A settlement procedure type for a derivatives contract where the underlying asset, or related delivery instrument, is delivered at the expiry of a derivatives contract.

Premium – The amount by which a cash commodity trades over a derivatives price or another cash commodity price (metals markets). See also *Basis*.

Relevant Oversight Body (ROB) – A market authority, such as an exchange, a self-regulatory organization or a financial regulator that oversees an RSI. This oversight can be through direct governance, at arm’s length or indirect.

Relevant Storage Infrastructures (RSI) – A storage facility that has been certified by the relevant exchange to store commodities or goods that are the underlying in the exchange’s derivatives contracts. Delivery of commodities, but not their transformation (such as refining or processing), can be an RSI function.

Chapter 1 - Introduction

This report (Report) sets out the findings and conclusions of the review by the International Organisation of Securities Commissions' (IOSCO) Committee 7 on Commodity Derivatives Markets (Committee) of the impact of storage infrastructures on the integrity of the price formation process of physically-delivered commodity derivatives contracts traded on regulated exchanges. The Report concludes that, based on the Committee's research review, an industry survey, and a public roundtable, IOSCO's *Principles for the Regulation and Supervision of Commodity Derivatives Markets*¹ (September 2011) (IOSCO Principles) provide an adequate framework for implementing effective oversight, governance and operational controls of storage infrastructure, and did not require additional principles or revision of the existing principles. However, the Report identified certain practices surrounding storage infrastructure that have the potential, if not addressed by appropriate policies and procedures, to affect derivatives pricing and affect efficient market operation.

Accordingly, this Report recommends that IOSCO conduct further work to develop guidance that builds upon, and supports, industry best practices with respect to the operation and oversight of storage infrastructures.

1.1 Background

In September 2013, the IOSCO Board approved the Committee's request to initiate a project to gather information on, and explore the implications of, storage infrastructure on the integrity of the price formation process in physically-delivered commodity derivatives contracts traded on regulated exchanges in four broad areas:

1. ambiguities concerning the scope and enforceability of existing rules and regulations related to storage infrastructures;
2. conflicts of interest arising where storage operators and exchange participants operate within the same corporate structure;
3. the potential for the structure of storage infrastructures to distort and create inefficiencies in the price formation process, for example in the form of capacity constraints or delivery delays due to minimum load-out rates; and
4. ambiguities regarding whether, and to what extent, storage infrastructures and regulated derivative market operators are responsible for collecting and disseminating storage related information to the market.

The Committee initially conducted research to better understand the role of storage and physical delivery in derivatives markets. In order to gather current information, the Committee sent a questionnaire to market regulators and five types of market participants (exchanges, clearing houses, storage operators, market intermediaries, and end users) in the energy, agriculture and metals markets. A total of 41 respondents representing regulators and market participants responded to the questionnaire.

¹ *Principles for the Regulation and Supervision of Commodity Derivatives Markets* (September 2011), <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD358.pdf>. See Annex.

An industry roundtable was held in March 2015 to gain a better understanding of the issues raised in the survey responses. A total of 11 stakeholders from Europe and the United States representing exchanges, regulators, industry trade organizations and end users participated in the roundtable.

Analysis of this information provided a better understanding of how practices involving contract design; commodity storage and delivery logistics; the applicable oversight of infrastructure processes; and, the availability of data could impact the price of a commodity derivative.

1.2 The importance of storage infrastructure for physically-delivered derivatives contracts

The price formation process for commodity derivatives is complex and is affected by many factors, not just the traditional elements of supply and demand. Rail cars, grain silos, oil tankers and metal warehouses are all fundamental components of a delivery system which ensures derivatives contracts can be fulfilled and commodities are delivered. Physical delivery and storage infrastructure can therefore have a profound impact on the economics of the futures markets, such as the cost of carrying the derivatives contract, convergence between the derivative and the physical market prices, and the premiums for each of the contract's delivery points.

The market is also influenced by the behaviour of its participants, from the arbitrageurs, who play an important role in bringing convergence between the derivative market prices and the physical market prices, to the hedgers offsetting their risk exposure in the physical market, to the speculators that provide risk capital to the market. The different types of market participants view storage facilities differently and although some may never make or take delivery in the derivative market, they are all affected by the price formation process.

The trading and settlement of physically-delivered commodity derivatives differs fundamentally from cash-settled commodity derivatives in that the deliverable supply of the underlying physical commodity is finite. The exchange rules governing the terms and conditions for each derivatives contract specify the quantity quality of the physical commodity, delivery locations and terms for delivery, which delineate the deliverable supply on the contract. Commodity derivatives that require delivery of a physical commodity can be susceptible to manipulation or price distortion when the deliverable supply on such contracts is disproportionate relative to the size of positions held by traders, individually or in collaboration, as the contract approaches expiry. Although the vast majority of commodity futures contracts traded do not result in actual delivery of the physical commodity, the possibility of physical delivery is critical for the contract to serve as an effective economic tool for hedging and price discovery. For physical delivery contracts, the credible possibility of delivery is the market force that drives convergence of the prices in the physical and derivatives markets at the expiry of the contract. Price convergence is facilitated when the commodity derivatives contract's terms and conditions accurately reflect the characteristics and operations of the underlying physical market.

IOSCO previously discussed the importance of physical delivery and factors that could affect price convergence at the expiry of a contract in the IOSCO Principles:²

For derivatives contracts calling for delivery of the underlying product, delivery is the critical mechanism that drives price convergence. For example, as a futures contract approaches expiration, differences between the futures price and cash price (which generally reflect the sum of costs and benefits of storing, handling, transporting and lending income and convenience yield of the cash commodity (i.e., the carrying costs)) should be reduced. There always will be some frictional differences due to differences between the terms and conditions of the commodity derivatives contract and the physical commodity actually delivered, such as for example actual storage and transportation costs and recognized delivery grade variations.

Effective convergence requires not only that the terms and conditions of the contract generally reflect the operation of the underlying physical market [...] but also that those terms and conditions will result in an adequate deliverable supply that reasonably can be expected to be available to both long and short traders at its market value in normal physical marketing channels. The totality of these design considerations help ensure that the contract will not be susceptible to manipulation or distortion.

Key considerations that promote effective price convergence for a physical delivery commodity futures contract should include an analysis of deliverable supplies and locations, quality or grade of the deliverable commodity, inspection and certification procedures, size of the delivery unit, adequacy (including accessibility and financial condition) of delivery points and facilities, and the delivery process (timing, storage, transportation). A straightforward and well-designed delivery process promotes arbitrage between the physical and futures market that is necessary for convergence to occur, provided that the terms and conditions accurately reflect the physical market, those terms and conditions as well as market practices are clear to market participants, and there is sufficient liquidity in the commodity derivatives contract.

The estimate of deliverable supply should reflect the quantity of the referenced commodity product that is or will be in store at the delivery point(s) specified in the commodity contract or that economically can be moved into or through such points within a short period of time after a request for delivery and which is available for sale on a spot basis within the marketing channels that normally contribute to the delivery points.

In particular, delivery terms should be scrutinized closely for possible impediments to delivery or incentives not to deliver. Such impediments may be related to the inherent nature of the commodity as traded in the physical market (such as the size of deliverable supply or seasonality, supply and demand of the commodity, the types of participants dealing in the physical commodity and their specific trading

⁴ Principles for the Regulation and Supervision of Commodity Derivatives Markets (September 2011), pages 23-24. <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD358.pdf> (See Annex)

practices) or to the mechanics of the delivery process (for example, transportation requirements, costs of inspection).

For example, with respect to physical-delivery commodity contracts that use a shipping certificate or similar delivery instrument, the consideration of deliverable supply should reflect the fact that the underlying commodity may not have to be moved into or through the delivery point(s) prior to delivery of the shipping certificate in the futures market.³ Similarly, if a change occurs in the production areas, marketing patterns, or export locations for a commodity, the delivery locations specified by the contract could eventually deviate from customary merchandising arrangements and no longer reflect commercial realities.

The contract design principles set out in the IOSCO Principles are particularly relevant to IOSCO's current inquiry because those principles have as their common objective the design of commodity derivatives contracts that accurately reflect the operation of the relevant underlying physical market. The principles seek to address general concerns encompassing contract design, including settlement and delivery procedures. The contract design should reflect the operation of the relevant underlying market, enhance accountability by relevant market authorities for compliance with applicable standards, ensure responsiveness to the views of potential contract users, and provide transparency of relevant information concerning delivery and pricing.

Physical delivery is also addressed in the *Principles for Financial Market Infrastructure*⁴ (PFMIs) published jointly by IOSCO and the Committee on Payment and Settlement Systems (now known as the Committee for Payments and Market Infrastructures) in 2012:

Principle 10: [A financial market infrastructure (FMI)] should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

Key considerations 1. An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities. 2. An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

With the survey results, roundtable and research the Committee was able to gain perspective on the situation of storage across several asset classes. A review of the information obtained from the survey, roundtable and research has shown the relative importance of current storage

³ For an illustration of the complex manner in which delivery terms may affect price convergence (and the differing academic analyses regarding the convergence issue) see *Report and Recommendations of the Subcommittee on Convergence in Agricultural Commodity Markets to the Agricultural Advisory Committee of the Commodity Futures Trading Commission on Convergence in Wheat with Implications for Other Commodity Market* at: <http://www.cftc.gov/ucm/groups/public/@aboutcftc/documents/file/reportofthesubcommitteeonconve.pdf>

⁴ *Principles for Financial Market Infrastructures*, Report of the Committee on Payment and Settlement Systems and the IOSCO Technical Committee (March 10, 2011), <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD350.pdf>.

and logistical issues in different commodity asset classes, with metals – aluminium in particular – and agricultural commodities currently being more affected by these issues than energy commodities because of the nature of storage for those asset classes. Nevertheless, the impact of these issues is subject to change, and could become more important for example in energy commodities, if, for example, the availability of floating or land-based facilities become limited for crude oil storage.

1.3 Issues with the current regulatory structure

This Report focuses on the regulatory structure that currently exists and highlights issues that may impede market efficiency. These concern:

- Inconsistencies that exist between derivatives contract specifications versus the commercial arrangements with the warehouses and how they can contribute to inefficient load-out and delivery of certain commodities.
- Lack of information about the movements on the physical market and how this can create problems in regulating the financial market.
- Level of oversight of exchange-regulated storage and delivery.
- Ambiguities about the degree to which regulators may conduct oversight or may be able to take corrective action.

1.4 Report Structure

Chapter 2 discusses the variety of structural relationships that exist among storage infrastructures, related exchanges and clearing houses and governmental authorities, and highlights issues that may impede market integrity and efficiency.⁵ Issues discussed include: contract design and contract specification from the perspective of how those provisions impact load out and the delivery of certain commodities; the level of transparency with respect to commodity stocks in storage; the legal relationships among storage infrastructure and relevant exchanges and regulatory authorities; with particular attention paid to the interaction with the physical market, and cross-border issues and the regulatory tools necessary to ensure adequate oversight.

Chapter 3 discusses the actual operations of storage infrastructure and how the fundamentals of operations differ across commodity classes, due to the nature of the underlying commodity. The potential for fee structures to create conflict of interest is also examined.

Chapter 4 discusses governance and the potential conflicts of interest which can arise within the highly diverse and not uniformly transparent storage infrastructures. This chapter emphasizes the importance of transparency in conflict of interest policies needed to protect market integrity.

⁵ This Report adopts definitions of market integrity and efficiency that appear in the IOSCO Board's final report , FR09/11 *Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency* (October 2011) at p. 9.
<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD361.pdf>.

Chapter 5 discusses the disparity in access to information and data among storage infrastructure and emphasizes the importance of access to information and data by relevant oversight authorities in order to ensure efficient and well-functioning markets.

Finally, Chapter 6 sets out conclusions and recommends IOSCO conduct further work to develop guidance underscoring and supporting industry best practices with respect to the operation and oversight of storage infrastructures and the IOSCO Principles.

Chapter 2 - Regulatory Issues

The survey responses, research and the discussions at the industry roundtable meeting in March 2015 reflect the perception Relevant Storage Infrastructures (RSIs) are not directly subject to the regulatory structures of commodity derivatives market regulators.

Such a perception may be due to the diversity of entities involved in the storage and physical delivery process related to settling physically deliverable futures contracts traded on an exchange which include: the exchange, buyers, sellers, the clearing house, members of the exchange, and of the clearing house, storage operators, storage regulators (for example, physical market authorities), and financial regulators. Such an array of actors, the differences in global regulatory oversight, and the vagaries of individual commodity markets clearly make it difficult for relevant market stakeholders to imagine physical storage and delivery mechanisms as a homogenous piece of infrastructure.

Exchanges generally define a set of commodity or sector-specific rules governing storage and delivery in the contract specifications or in their rulebooks. As a derivatives contract approaches expiry, buyers and sellers are matched in a defined delivery period by the clearing house according to the exchange's rules. The exchange and clearing house guarantee performance on the transaction, registered warehouses participate in a contract's delivery mechanism, and load in and load out the physical commodity upon demand by the owner of the delivery instrument according to policies and procedures laid out by the exchange and sanctioned by the regulator.⁶

In most jurisdictions, oversight of warehousing and delivery is carried out by the exchanges. Due to the complexity of the processes, the number of commodities or commodity groups, and the participation of third party entities for certain aspects of the process (for example, licensing and grading), there may be separate teams within the exchange for monitoring of trading, listing, and physical delivery and storage operations. In some cases, the oversight of the storage and delivery function is outsourced by the exchange.

In all cases the Committee reviewed, exchanges are mandated with maintaining derivative markets which are fair and orderly and free of fraud and manipulation, and financial regulators perform oversight of the exchanges. Although most financial regulators do not have the remit to act as a relevant oversight body (ROB) of RSIs, financial regulators do have some authority related to how the exchanges under their authority oversee RSIs, although how such authority may be exercised varies greatly by jurisdiction. Thus, while financial regulators have enforcement and investigative authority to address concerns of misconduct that may affect derivative markets, the oversight by financial regulators over storage infrastructure is complex, at arm's length, and often, indirect.

In many jurisdictions, the regulator's authority is derived specifically from its oversight of exchanges and the exchange's statutory obligations, such as to only list contracts that are not subject to manipulation, the responsibility to detect and deter manipulation, the requirement to provide equal and fair access to trading, the responsibility to monitor trading,

⁶ The degree to which an exchange must seek approval, concurrence or simply notify the regulator of the terms of a futures contract varies by jurisdiction and commodity.

and maintain market transparency. Exchanges, in turn, impose a set of requirements on facilities and facility operators that participate in the physical delivery process of an exchange-traded commodity. Such requirements can include the obligation to load out the commodity in the quality and quantity designated in the derivatives contract within a specified timeline, or at a specified rate (especially if the contract in question is a free-on-board/truck contract), and that the commodity is appropriately stored.

Most commodity derivative exchanges and clearing houses which list or clear physically-delivered commodity derivatives contracts consider themselves ROBs of the RSIs that facilitate settlement of such contracts. In general, financial regulators of exchanges reported they do not have direct oversight of RSIs, but rather have high-level regulatory requirements for exchanges which include ensuring RSIs support the objectives that derivatives contracts are priced effectively, settled efficiently and that the market remains orderly.

Several notable exceptions to this model were identified. Some exchanges reported they are not ROBs for RSIs where there are commodity-specific regulators within their jurisdiction which license and monitor storage (including RSIs) directly. This is despite the fact the exchanges themselves also license RSIs in accordance with their own rules.⁷ There is one jurisdiction where the oversight of storage (including RSIs for grain) is performed by self-regulatory industry bodies and not the relevant exchanges or the financial regulator.

2.1 Types of delivery mechanisms and duration of storage/load out

As discussed above, differences regarding the type of rules exchanges and clearing houses impose on RSIs can be based on which type of commodity it stores as well as the legal basis of the jurisdiction in which the RSI is located or the exchange is based. In addition, the survey responses and the Committee's research reflect the myriad ways in which commodity derivatives contracts may be designed. These range from in-warehouse contracts, to free-on-board/truck contracts, to both-option contracts (whereby the buyer and seller have to agree whether the contract is physically delivered or cash settled). The precise delivery mechanism chosen for a commodity is informed by the characteristics of the commodity itself and the way in which it may be transported or processed. Many trading venues take advice from market participants or end users, either informally through consultations on matters such as contract design or formally through the establishment of committees whose mandate covers storage, delivery or other related matters.

All of the larger commodity derivative exchanges reviewed have load-out rate requirements for their RSI that are tailored to each underlying commodity. In addition, several exchanges have rules setting maximum time frames regarding the delivery out of inventory which range from 30 to 60 days. Furthermore, two large multi-commodity exchange groups can prevent rent from being charged by the RSI if delivery time-limits are breached. As noted above, all exchanges identified by the survey, with three exceptions, oversee their RSIs and have different requirements regarding how their RSIs should store and load out the underlying inventory.

⁷ Entities have not been identified as most respondents to the survey asked that their responses be kept confidential.

Some exchanges have a longstanding practice of conditioning participation in the delivery process of the derivatives contract on an RSI's agreement to prioritize load-outs in fulfillment of derivatives contracts over the RSI's other warehousing and merchandising activities. This is more typical for perishable commodities, such as agricultural and soft commodities. When there is not such a precedent, exchanges tend to face much stronger opposition from RSI owners regarding rule changes to expedite delivery rates, as they are able to operate a viable queue-based business model. One respondent to the Committee's questionnaire noted how load-out rates were ineffective in certain exchange rules, as minimum load-out rates were often treated as maximum load-out rates by certain RSIs. However, another respondent explained that there were logistical constraints regarding how much physical stock an RSI can load out in the case of a large cancellation/request for load-out of a commodity.

2.2 Transparency

RSIs straddle both the physical and derivatives markets and play a key role in facilitating supply and demand forces between the two. Market participants, exchanges and ROBs rely on a wide variety of public and private sources, some more reliable than others, for data about physical market holdings of stocks and their movements; for example, there is only one exchange which receives off-exchange stock information on a regular basis for metals. Another exchange has recently amended its contractual arrangements with its RSI to access information regarding non-exchange-related stock, although this will be anonymised and only obtained when relevant to an investigation. The Committee's research found one exchange posts a weekly report on stocks of grain, both deliverable and non-deliverable grades, on the public portion of its website by delivery territory. That exchange also reports movements into and out of registered warehouses for other commodities. Several exchanges have monetised some of their data streams and there are a number of private data providers that charge fees for hardware, software and regular reports on the physical markets.

One participant at the industry roundtable stated that more information on ownership of commodities in load-out queues in certain RSIs should be made available, and additionally whether the commodity is being used as part of financing deals or as financial collateral (for example, if the commodity was specifically allocated and could not be used easily to meet physical demand). The same participant also sought more information regarding the nature of stock movements both off and on-exchange due to a belief that such movements helped create the long load-out queues at an exchange's RSIs as discussed previously. One exchange has sought to define the term "load out from RSIs" in its rules and additionally now requires warehouse owners to report all inducements paid to commodity owners. However, some exchanges have stated they do not actually see any evidence of significant stock movement between on-exchange and off-exchange storage and therefore see no effect on pricing of the relevant commodity derivative.

Other exchanges stated that they do notice sufficient stock movement between on-exchange and off-exchange storage, but believe the main driver to be economic regarding storage rent differentials (*i.e.*, off-exchange storage costs are often lower than exchange-related storage owing to stricter rules about how the commodity must be stored so that it is easily accessible in a warehouse). However, rent price differences and last minute deliveries

do not appear to be the sole reason for such movements between off- and on-exchange stocks.⁸

Furthermore, other roundtable participants stated that there are gaps in understanding by financial regulators regarding how RSIs affect price formation on exchanges and what behaviour by owners and users of RSIs is unacceptable. There also is a perceived lack of cross-border regulatory co-operation to detect instances of abuse.

2.3 Legal

The Committee heard differing views on the adequacy of current oversight arrangements for RSI. In the roundtable discussion, two participants stated that financial regulators should have regulatory powers that would have prevented RSIs from creating metal queues, which they argue has distorted the relationship between physical prices and the prevailing financial exchange-traded price. However, two other roundtable participants advised caution regarding increased financial regulatory scope, which they feared could bring about unintended consequences given their perception of the level of understanding of physical storage and physical markets amongst financial regulators.

The survey and research did not find that exchanges or financial regulators have competition powers over RSIs apart from the power to list and delist (*i.e.*, to determine as eligible to meet exchange delivery requirements) warehouses in the event of over-concentration or abusive practices. However, one exchange has rules which specifically seek to set up the delivery warehouse in an area with sufficient competition, and another endeavours to list as many storage operators as possible to encourage competition. One financial regulator has assumed concurrent competition powers which cover abuses of dominant positions by RSIs, and agreements or other arrangements between RSIs which restrict competition. Various respondents alluded that all RSIs need to adhere to competition law in general, but no other competition authority responded to the survey.

Financial regulators include independent or quasi-independent entities and government bodies. In instances where exchanges and clearing houses have oversight of RSI arrangements as the ROB, the exchanges are considered self-regulatory organizations. Where governmental or regulatory agencies directly regulate the RSI, the governmental entity is the ROB. There is one country where all RSIs are licensed and monitored by government agencies even though the exchange also has a contractual agreement with each RSI. However, survey respondents and roundtable participants did not express a clear preference for a particular oversight structure nor were views expressed on specific positive or negative aspects of the different types of arrangements.

2.4 Cross-border issues

Since RSIs voluntarily participate in an exchange's physical delivery process they subject themselves to the relevant exchange rules regardless of whether they are located in the same jurisdiction as the exchange. Conversely, a commodity derivatives regulator

⁸ See generally, U.S. Senate, Permanent Subcommittee on Investigations, Majority and Minority Staff Report, "Wall Street Bank Involvement with Physical Commodities," November 18, 2014 ("PSI Report").

commented that its authority does not extend outside of its home jurisdiction. This is the crux of the regulatory uncertainty of the appropriate financial regulatory body when an exchange lists contracts with overseas delivery operated by RSIs in jurisdictions other than the exchange's home jurisdiction. One exchange said it had extra-territorial authority but it does not have any licensed warehouses outside of its home country.

One survey respondent expressed the view that the one true global market was the metals market. In such a global market, there would theoretically be no regulatory limitations regarding the location of RSIs as a global warehousing network would be managed and overseen appropriately and comprehensively.

The vast majority of stakeholders expressed a need for consistency in cross-border regulation for all commodities, whilst ensuring enough flexibility to ensure no conflicts of law with national regimes and a level playing field between differing jurisdictions and different exchanges.

2.5 Relationship to physical market

Jurisdictions – and exchanges within those jurisdictions – take different regulatory approaches in defining a derivatives contract's relationship to the physical market. Two exchanges specifically commented in the survey that they require best practices from RSIs and regularly liaise with the industry participants in the physical market regarding what this should entail. Some exchanges also noted that their RSIs usually enjoy higher recognition from market participants as being more resilient and a safer way to store inventory as opposed to off-exchange storage. One exchange has different rules for different commodities to reflect the differing needs of physical market participants. However, one exchange prefers not to have too onerous requirements over RSIs in off-exchange storage as this may cause storage not to be utilised efficiently, and another only has rules for exchange-related stock.

At the roundtable, an exchange participant stated it does not see itself as a competitor to physical metals markets but rather as a market of last resort for producers and consumers. Thus, on this particular market, the exchange maintained there is always a natural premium in the physical market above its global derivative price. There was a general consensus among the stakeholders at the roundtable that commodity derivatives contract markets should reflect the practices of the underlying physical market.

2.6 Oversight

In general, exchanges have powers to sanction a licensed RSI if it has contravened its contractual obligations with the exchange. These powers are broadly the same across the exchanges which responded to the survey, and include revoking an RSI's ability to participate in the delivery process as an exchange-registered entity, imposing fines, and reducing exchange-recognised storage capacity. There were three notable exceptions whereby one exchange has no disciplinary control over its RSI, another exchange can make the RSI operator pay the commodity owner compensation if the RSI fails to deliver out the commodity on time, and another where a financial regulator could fine an RSI if it contravenes relevant financial legislation even though the related exchange remains the supervising ROB.

Commodity queues at two particular RSIs dominated discussions at the roundtable. Commodity end users stated financial regulators should force an exchange to change its market structure where lengthy delivery queues impact its derivatives markets. One exchange explained it had made several recent changes to expand its rules so it now has stronger powers to monitor and take action against RSI behaviour that adversely impacts upon its derivatives market.⁹

In cases where there is a persistent lack of convergence between the physical and derivatives markets or when the derivatives contract no longer serves its price discovery function, stakeholders generally thought ROBs should use extreme measures, such as delisting a derivatives contract, in only the most serious of cases.

2.7 Contract design process

Each physically-delivered derivatives contract has what is known as a delivery instrument, which entitles the bearer to some pre-identified quantity and quality of the physical commodity. Most exchanges use a delivery instrument such as a warrant or warehouse receipt, which designates a specific physical lot as the property of the holder of the delivery instrument. One notable exception is an exchange that uses shipping certificates as the delivery instrument for some very widely traded agricultural derivatives contracts, such as corn and soybeans. The shipping certificate is backed by a letter of credit or warehouse receipt and allows an RSI to store its eligible stock outside of the exchange-approved storage infrastructures, so long as it is able to fulfil the contract's load-out obligations at the contract grade within a specified period of time. The exchange adopted this alternative mechanism in response to a decline in the deliverable supply at the contracts' historical delivery points as a way to expand the delivery territory to barge-loading throughput facilities.

The Committee's research highlighted that all exchanges require some form of flexible storage in order to ensure enough deliverable supply to settle contracts. Three exchanges have rules regarding where RSIs can operate, such as requiring RSIs to be located within areas of high net consumption and exchange approval of storage space on a case-by-case basis as necessary.

The Committee's research also revealed that operational practices to achieve flexible storage varied. One exchange group's RSI approval process only allows for limited flexibility in storage capacity, above which RSIs have to re-apply. One of its exchange rules is more stringent for metals RSIs compared to those of other commodities, where any change in storage capacity has to be notified to the exchange.

At the roundtable, an exchange noted that it consults with market participants regarding contract design to ensure sufficient storage capacity, and another consults with its market participants regarding their contract specifications through various physical and

⁹ One exchange explained its specific reforms to reduce embedded queues including linking RSI load-in rates to their load-out requirements (*i.e.* RSIs need to load out more volume than they load in). However, the implementation of this particular rule was delayed after a legal challenge from a commodity producer, which delayed the mitigating effect the rule has on queues. This legal challenge was subsequently overturned on appeal, and the rule is now implemented and beginning to reduce structural queues.

financial user committees. In contrast, one commodity market regulator has a simple parameter for RSI approval which consists of ensuring there is no restriction on access to commodity producers.

2.8 Co-operation arrangements

Research found disparities regarding the level of transparency among different regulatory bodies regarding regulatory oversight and co-operation. At the roundtable, market participants expressed uncertainty regarding regulatory oversight over commodity derivatives contracts and storage infrastructure when more than one jurisdiction was involved. While regulatory oversight is not globally consistent, our research found that most jurisdictions were signatories to a number of information sharing and co-operation arrangements, although these agreements may not be known to market participants. Some financial regulators do not disclose the information sharing and co-operation powers they have with other ROBs publicly.

One regulator noted the existence of delineation between themselves (as market infrastructure supervisors), the commodity exchange supervisors and the supervisor of energy companies and wholesale energy markets. Another regulator explained how its memorandum of understanding (MOU) with the energy regulator dealt primarily with the sharing of information in the case of market abuse in those markets.

Chapter 3 - Operations

The delivery process is inherent in the life cycle of a physically-delivered commodity derivatives contract and thus crucially important in the integrity of the price formation process. Research performed by the Committee, the survey and the industry roundtable have underscored that operations performed by RSIs are very different across commodity classes, making uniformity of practices challenging.

The vast majority of physically-delivered derivatives contracts are not held to expiry. Users of the underlying commodity often trade derivatives to hedge the price risk arising from their underlying physical activities, rather than to make or take delivery of the underlying commodity. However, the credible possibility of delivery and a well-functioning storage and delivery system are essential to effective functioning of derivative markets and to help in convergence of derivative and physical prices. Consequently, any dysfunction or disruption in the storage or delivery processes of the underlying commodity may have a material impact on price convergence and be reflected in widening market premiums for cash commodity. As such, the storage related processes and procedures must be perceived by the market as working efficiently and effectively under all market conditions.

Physically-delivered commodity derivatives contracts are connected to one or several RSIs in order to organise and operate the delivery of the underlying commodity and there are usually multiple delivery territories for each contract. In most jurisdictions, exchanges or clearing houses do not operate such RSIs themselves. The majority of RSIs are private entities that also perform warehousing, storage and general merchandising activities in the physical markets for the commodities underlying the derivatives contracts. As mentioned previously, RSIs participate in the commodity derivatives contract delivery mechanism on a voluntary basis. They and other market participants do so according to the detailed processes for making and taking deliveries described in the exchanges' or clearing houses' rulebooks or contract specifications.

As expressed in the market participants' responses to the survey, storage and delivery operations are a key element in the price formation process in both cash and derivatives commodity markets. Operations performed by RSIs have a direct impact on risk management and price formation and play a key role in achieving convergence between derivatives and physical market prices and affect market integrity and efficiency.

Survey respondents and roundtable participants mentioned the following factors that particularly affect the integrity of the price formation process and the integrity of the markets:

- interactions between market infrastructures (exchanges, clearing houses and warehouses);
- segregation of goods in the warehouse and fungibility;
- rent/storage fees;
- load-in/load-out rates; and
- premiums.

3.1 Interactions between market infrastructures

The Committee's research revealed that as a physically-delivered commodity derivatives contract approaches its expiration, exchanges or their clearing houses execute some type of matching algorithm to pair market participants who have short positions and have signalled that they are willing to make delivery (delivery makers) with those holding long positions (delivery takers). Where delivery can be made at multiple locations, the location is typically selected by the delivery maker. In certain situations this ability of delivery makers to select the delivery location has consequences for the market: delivery makers are most likely to select locations that are cheapest to deliver, which may not necessarily be the most convenient for the delivery taker.

Contract terms and conditions describe how payment is made and exchanged in return for the delivery instrument. The long position holder or delivery taker is informed of the delivery location of the stored commodity only upon receipt of the delivery instrument. In some sectors, such as grain commodities, the short position holder (delivery maker) is also the RSI and plays an active role in convergence. In other sectors, such as metals and soft commodities, the RSI may not be a market participant at all. Even when the RSI is the short position holder, the RSI does not systematically participate in the allocation process, which is defined in exchange or clearing house rules. The RSI might, in some cases, not even be aware of such allocation until delivery instructions are received from the clearing house.

In many jurisdictions it is the exchange's responsibility to record and track the ownership of the delivery instrument throughout its lifecycle. The holder of the delivery instrument is the commodity owner and is registered in the exchange's system. Some delivery instruments are cancelled immediately, such as when they are made directly into a pipeline or onto a ship. When a commodity derivatives contract allows for storage, delivery instruments are only cancelled when the delivery taker loads out the commodity or if the RSI buys back its own delivery instrument and sends cancellation instructions to the exchange.

3.2 Segregation and fungibility

Based on the Committee's research, an RSI may store the same commodity for both the derivatives and the physical markets. Exactly how the commodities are stored, and whether and how they are segregated and identified for each of these purposes varies greatly by commodity, and depends on the nature of the commodity and an exchange's rules governing RSIs' operations.

Exchange rules can treat commodities on an allocated or on a pooled basis. For allocated commodities, customers own specific lots of the commodity, while for pooled commodities customers do not own a specified lot but rather a quantity and grade of the commodity in storage. Whether commodities are treated on an allocated or pooled basis is greatly influenced by the physical nature of the commodity: for example, metals are often treated as allocated commodities while energies (natural gas, oil, etc.) and grains are treated as pooled commodities. For allocated commodities the delivery instrument is typically a warrant or warehouse receipt. Contract specifications for allocated commodities are designed to ensure efficient load out, and can include restrictions on the minimum aisle size in the RSI or the maximum height that a commodity can be stacked.

For pooled commodities, the delivery instrument is usually an instrument representing a quantity or grade, rather than a warehouse receipt or warrant identifying a specific portion of the commodity. In such cases, the holder of the delivery instrument has claim to the underlying commodity in the amount and grade specified in the contract at a designated location and unloaded into the holder's conveyance. Such delivery instruments do not require the warehouse operator to designate a specific lot of the commodity. These procedures give flexibility to RSIs in the management of their storage space. In commodities that are fungible, exchanges usually set product quality and locational differentials commensurate with the physical market.

Several roundtable participants noted that RSIs do not systemically track whether a commodity is held to cover the obligations under a physically-delivered commodity derivative or to settle a physical market physical transaction. In such cases there is no distinction or indicator maintained by the RSI between the goods dedicated to be delivered against a specific purpose.

3.3 Rent/storage fees

RSIs collect storage fees or rental income on the commodities stored in conjunction with a derivatives contract. This might create a conflict of interest for RSIs in their stock and queue management.

For some commodities, such as agricultural commodities, some exchanges may set a maximum storage fee for the commodity derivatives contract. Some exchanges and warehouses publish this information in their rulebooks. For other commodities, such as metals, warehouses negotiate their fees bilaterally with each client. Financial regulators and exchanges do not have access to the bilaterally negotiated rates in most jurisdictions.

The research found that fee structures for storage are principally comprised of the daily storage fee, but may also include other fees, such as for inward and outward handling, transportation and ancillary services such as documentation and grading. In some cases the exchange may establish variable fee structures depending on the seasonal demand for storage space. Most exchanges periodically re-evaluate the fee schedule that RSIs are allowed to charge.

As mentioned earlier, roundtable participants commented that commodities stored for the purposes of delivery against a derivatives contract may be subject to higher storage fees than commodities stored for the physical market because of the additional cost for storing, segregating, controlling, and handling.

In the case of at least one exchange, the differential is significant. However, in this case, holders of delivery instruments benefit from a regulated and secure system for holding their inventory, which enables the underlying commodity to be stored in RSIs as collateral to raise credit, or to be redelivered on the exchange.

In addition to the published fees, RSIs may give some or all customers discounts or incentives. These can include discounts on handling charges and discounts on fees for physical market commodities if the customer also stores a derivative-linked commodity. In general, these discounts have the potential to affect customers' decisions regarding loading in

or loading out commodities from storage facilities. As with the bilaterally negotiated rates, exchanges and financial regulators do not typically have access to this information.

3.4 Load-out rates

Load-out rates are a critical aspect of commodity storage, as these determine the ease and speed with which users can retrieve their commodities into and out of storage. Excessive barriers and delays in either have the potential to disrupt the flow of commodities and cause dysfunction in the market, as discussed above. The Committee's research revealed there is considerable variation across exchanges and commodity classes on how these operational parameters are specified. In some cases, these rates are detailed in the contract specifications, while, in other instances, exchanges specify these terms in their contracts with the RSI. In cases where load-out rates are included in the contract specifications the Committee's research indicated variations: in some situations the rules mandate that load out begins within a certain time frame, while in other cases the contract specifications spell out when the load out is to be completed.

The ability for ROBs to mandate load-out rates can be complicated depending on whether its contracts are settled with a warrant representing inventory in-warehouse or free-on-truck. In the latter case, it is the responsibility of the RSI to ensure timely delivery in order to fulfil the terms of the contract and therefore much easier for a ROB to enforce strict load-out requirements. However, for an in-warehouse contract, the terms of the contracts are met as long as the inventory is housed within the RSI, and meets the contract specification. Despite the increased difficulties in imposing rules on RSI after the derivatives contract has expired, there have been notable examples of where rules have been enforced and are beginning to show effect; for example, there were operational delivery delays known as queues in RSI where contracts were settled in-warehouse. In these instances, the exchanges implemented defined load-out rates in order to seek to reduce the operational queues, and, in the case of one exchange, a further rule which linked load-out rates to the rate in which inventory was loaded in. These measures were effective in reducing structural queues in its approved RSI network.

There is a considerable amount of diversity in the way exchanges ensure that load out occurs in a timely fashion; and some exchanges use multiple methods. Some exchanges use punitive measures, such as prohibiting an RSI from charging additional rent if the load-out rate exceeds the required time frame. Other exchanges require RSIs to give priority to exchange-backed commodities and prohibit an RSI from loading-in additional commodity if there are outstanding load-outs. Most exchanges have a required load-out rate, a maximum load-out duration or a requirement for the load-out to begin within a specified time period. There is also a considerable difference in the transparency of load-outs. However, at least one exchange reported that it publishes reports on stock levels and load-out durations on its website.

3.5 Premiums

Some roundtable participants expressed concerns about premiums and suggested that in at least one market, the premiums no longer reflected market fundamentals, such as the cost of carry. The level of premium depends on the contracts settlement terms, the quality, branding or shape of the inventory and also whether the derivative market is global or regional. The ability for commodity derivatives to be physically delivered ensures the

derivative is anchored to the cash price. Locating approved RSIs in areas of physical net consumption can also reduce logistical costs. However, at least one exchange sees itself as the market of last resort for the physical delivery of inventory, and the related physical market is more tailored to commercial needs. The exchange noted that this can result in the physical market trading at a premium to the exchange's reference price.

Most financial regulators require commodity derivative exchanges in their jurisdiction to ensure that the reference prices discovered on their market are properly reflective of the underlying commodity market. If the price difference between the two becomes too great, the derivative markets' contracts may no longer provide an adequate mechanism for users to manage their price risk effectively. In such cases, ROBs would usually seek to improve the terms of the contract, usually through discussions with the relative commercial market, to seek to ensure its continual use as the source of a reference price.

Chapter 4 - Governance and Conflicts of Interest

The survey responses, research and discussions at the roundtable indicated that ownership structures of entities involved in the physical delivery process for commodity derivatives contracts are highly diverse and not uniformly transparent. Potential conflicts of interest can take on many forms. RSIs may, for example, structure incentives to concentrate inventory in certain locations in order to maximise rent receipts which may adversely affect the market by delaying access to stored commodities.¹⁰ Accordingly, because these business practices can inadvertently impact the delivery process, it is important that exchanges and RSIs carefully examine their procedures to identify and if necessary address conflicts of interest.

In the context of RSIs, governance rules and conflict of interest policies and procedures for different jurisdictions, and even exchanges within the same jurisdiction, are highly diverse in their scope and content. While a large part of the diversity is due to the particular characteristics of the commodity underlying the derivatives contract, some of the additional diversity is due to historical practice or the organizational structure of the exchange. As a result, the specifics about who performs what role in the delivery of a commodity and whether there are conflicts of interest may differ significantly. However, several patterns emerge:

1. In most jurisdictions, the financial regulator does not directly impose specific statutory requirements on RSI structures with respect to governance.
2. The ownership structure of the RSIs may or may not be generally available to the financial regulator as most jurisdictions rely to differing degrees on the exchanges to understand the structure of RSIs and to impose general conflict of interest obligations on storage facilities (financial regulators usually have access to such information through ad hoc information requests or enforcement actions).
3. As part of the contract design process, exchanges set forth, in their rulebook or licence arrangement, the processes and procedures for delivery, warehousing and load out, which may contain general conflict of interest and governance requirements, but such requirements often only include general provisions for supervision, performance, financial soundness and record keeping.
4. Many exchanges and clearing houses also rely on governmental agencies or third party quality control entities to regulate some portion of the relevant storage infrastructure or implement some portion of the operational requirements.

¹⁰ A specific example of this was alleged in the US Senate Permanent Subcommittee on Investigations' Report that raised concern that a warehouse operator may have incentivized holders of delivery instruments to engage in "merry-go-round transactions." This report concluded that these transactions may have contributed to long queues for getting metal out of warehouses in Detroit, which may have had the effect of distorting markets.

5. Information about warehousing business ancillary to exchange-regulated activities is not usually requested as part of the application process to participate in the delivery process, and information about market positions by storage owners or operators is available only to a limited number of staff at the exchanges and may not be regularly reported to financial regulators in some jurisdictions.
6. Few financial regulators have authority to regulate RSIs directly and most assert that their role is indirect.

Since derivative transactions, and in particular, the physical delivery and subsequent storage arrangements for a commodity underlying a derivatives contract all involve buyers and sellers who are anonymously paired in the market, appropriate contract design and exchange rules and procedures regarding delivery and load out play a pivotal role in avoiding conflicts of interest. For many commodity classes,¹¹ the delivery process, including warehousing, intentionally mirrors typical commercial practices and can be highly detailed. The level of detail also depends on whether the derivatives contracts' delivery terms specify immediate load out, loading onto a vessel or that the inventory is stored in an RSI.

Where participants in the physical warehousing, storage and delivery processes are also market participants, this range of overlapping activities has the potential to create conflicts of interest. Many exchanges encourage market participants to operate RSIs; for example, the storage operators that participate as regular delivery elevators for grains contracts are generally major grain firms. If there is a divergence between cash and derivative prices as a contract is moving towards expiry, it is expected that the regular elevators will bring about convergence through arbitrage; that is, the elevators would buy grain in the physical markets and tender it for delivery in the derivative market, which puts upward pressure on the cash price and downward pressure on the derivative price. The role that the arbitrageur plays is critical for the market and also in the financial best interest of the participating firms.

Nevertheless, there have been instances where contract design issues resulted in greater financial opportunities for regular firms to hold grain from one expiry to the next, rather than making delivery. This led to a prolonged period of lack of convergence in the Chicago Board of Trade and Kansas City wheat markets in 2007 to 2010 and ultimately to amendments to those derivatives contracts. The challenge for the exchanges and the regulator is to identify the potential for, and to avoid such conflicts of interest.

Logically, the potential for conflicts of interest is most prevalent where one entity has the ability to act in its own self-interest to the detriment of the market as a whole. To protect the market's integrity, a few exchanges mandate that the operators of storage and warehousing infrastructure must be independent from the entity's trading arm or that firewalls need to be in place to prevent the exchange of commercially valuable information. However, to enforce this requirement, the ownership interests must be known to the exchange. This is not always the case.

¹¹ For example, agricultural (grains, softs, livestock products) and energy (natural gas, petroleum) derivatives.

This review also found that there is variation in how exchanges monitor governance issues at RSIs: some exchanges perform occasional audits, or require third party audits of governance and corporate structures at each RSI. Some financial regulators impose requirements for regular monitoring of RSI governance structures for conflicts of interest, but others said they lack the authority to impose such requirements or that their authority is unclear. Conflicts of interest at warehouses raise the potential for one trader to have an advantage (for example, preferential treatment or access to information) over others, thus harming the overall integrity of the market.

Chapter 5 - Information access

The research, survey, and industry roundtable indicate that access to information and data stemming from the relationships between financial regulators, exchanges, clearing houses and RSIs is variable. The results of this review provide insight into issues concerning information access which affect the price formation of physically-delivered commodity derivatives contracts at the delivery point, as well as the degree of any ensuing price distortion.

Financial regulators exercise mainly indirect oversight over RSIs. With the exception of one jurisdiction, financial regulators do not generally have direct access to storage facility data due to the indirect nature of oversight. Some roundtable participants expressed the view that such indirect oversight has led to a lack of understanding of where regulatory responsibilities lie; this is exacerbated by cross-border issues where an exchange has RSIs in jurisdictions outside of its home jurisdiction. While financial regulators normally do not have direct access to information from RSIs, they do have access to RSIs' records in the context of investigations and enforcement.¹²

Exchanges tend to have more information regarding their RSIs, but this information may not include all elements that can influence the market. For example, exchanges do not have information about incentives and discounts that RSIs may offer to market participants. Such incentives can have a significant impact on participants behaviour and thus on the market.

Even where there is a degree of direct regulatory oversight, this review highlights a lack of unified focus in published materials on the interrelationships between market authorities, exchanges, clearing houses, and storage facilities. Such insufficient coherence of data sources and information was alleged to have been partially responsible for the 2014 case in Qingdao, China where alleged duplication of warehouse receipts to pledge metal as collateral for loans took place, which subsequently led to defaulting repurchase agreements, as well as for the 2013 National Spot Exchange Limited (NSEL) case in Mumbai, India where stored underlying physical commodities did not exist to support related derivatives contracts. Although these situations in the physical market may not have directly affected derivatives prices, they highlight concerns regarding RSI information transparency and quality.

Some stakeholders expressed concerns that the publication of certain data elements revealed confidential information about their commercial activities (for example specific contract details such as price and fee terms, negotiated between exchanges or clearing houses and storage facilities) and between storage facilities and end-customers, could put them at a commercial disadvantage.

The results of the Committee's research revealed that where clear and detailed information about the delivery and storage process is easily accessible, market practitioners are better able to determine the market's price and volume dynamics, as a result of enhanced

¹² For example, exchanges have access to the books and records of their RSIs, which could be examined by the exchange's regulator.

market transparency, enabling more equitable market access. The work undertaken in this research has underscored these points, even though the quality and accessibility of data have been shown to differ across classes of commodity derivatives and jurisdictions.

Similarly, with regard to exchanges and clearing houses and their websites, data transparency and ease of access to relevant information such as commodity product, volume and price history, delivery roll-in and roll-out times, RSI identity and ownership, RSI licensing and review processes, exchange and national regulation and law summaries, and market authority identity, legal basis, and remit, all vary significantly from an almost complete supply of raw, but not necessarily compiled, data, to very limited public information about market transactions and processes.

Some of these data are available, but only for a fee. In many jurisdictions, there are no specific regulations about which data must be provided free of charge. In all cases, our research has shown that, to a greater or lesser degree, key elements of information do not remain readily available to the public, nor often to the regulator. In a great many cases, information, where accessible, is limited and opaque.

Chapter 6 - Conclusions

This Report concludes that based on the Committees's research, survey and industry roundtable, the existing IOSCO *Principles for the Regulation and Supervision of Commodity Derivatives Markets* provide an adequate framework for implementing effective RSI oversight, governance and operational controls and do not require additional principles or changes to the existing principles that are relevant to storage infrastructure.

However, the review has identified certain practices surrounding storage infrastructures that have the potential to affect derivatives pricing and efficient market operations. These practices can potentially increase uncertainty among market participants and some practices may hinder financial regulators and exchanges from identifying emerging problems and working toward resolution once problems have been identified. These practices could potentially cause market disruption, affect market efficiency and impair the price convergence process.

Bringing greater awareness of the occurrence of these practices and their potential effects on pricing and the operations of markets as noted above may encourage the parties involved in storage infrastructure to anticipate, identify and address potential issues at an early stage in order to forestall the occurrence of such problems and the need for regulatory involvement.

Accordingly, this Report recommends that IOSCO conduct further work to develop guidance in the form of Good or Sound Practices¹³ that build upon and support existing best practices with respect to the operation and oversight of storage infrastructures.

For example, the following issues and implications for storage infrastructure practices identified by the review suggest areas in which such Good or Sound Practices might be developed:

1. There is a wide range of practices related to storage of physical commodities and warehouse operations. These practices vary by type of commodity, exchange, and jurisdiction. However, as noted above, addressing these practices does not require changes to, or the development of any additional, IOSCO principles that are relevant to storage infrastructure.¹⁴ Therefore any Good or Sound Practices developed as a result of further work should take this range of practices into account rather than devising a one-size-fits-all solution.

¹³ This report adopts the taxonomy set out in the *Framework for Updating the IOSCO Principles and Methodology* that was developed by the IOSCO Assessment Committee and approved by the IOSCO Board in April 2014. "Good or Sound Practices" are defined as practices that regulators could consider. Such practices would not be reflected in the Methodology [for Assessing Compliance with the IOSCO Principles] as they do not represent a standard that IOSCO members are necessarily expected to implement or be assessed against."

¹⁴ IOSCO *Principles for the Regulation and Supervision of Commodity Derivatives Markets*. <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD358.pdf>. See also CPSS-IOSCO *Principles for Financial Market Infrastructure*. Report of the Committee on Payment and Settlement Systems and the IOSCO Technical Committee (March 10, 2011), <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD350.pdf>.

2. Financial regulators generally do not have direct day-to-day authority over warehouses. In most cases, financial regulators regulate exchanges, which, in turn, are responsible for ensuring compliance by commodity warehouses with exchange or clearing house rules regarding storage and delivery. In most cases, financial regulators do have direct authority over warehouses for investigations and enforcement actions related to their relevant statutory oversight. In these circumstances there is a risk that financial regulators have a limited ability to detect emerging problems; and when problems are identified, it may take longer to resolve them because of questions of regulatory reach.
3. In some cases multiple regulatory bodies are involved in regulating different aspects of the market and storage. For example, one regulator could have oversight over derivatives trading while a different regulator oversees the physical markets. The different regulators may have MOUs between them, but even when they do the scope of the MOUs varies widely. Unless there is clarity about respective roles, this may cause confusion among market participants about regulatory authority and possibly affect the speed with which issues can be resolved.
4. Cross-border issues where an exchange has warehouses in a jurisdiction other than its home jurisdiction may further exacerbate problems of regulatory certainty, as market participants (and, possibly, exchanges and regulators themselves) may be uncertain about the jurisdiction and roles of the different regulators involved. A lack of clarity over responsibility may mean that emerging problems are not readily identified and resolution may take even longer.
5. Exchanges regulate critical aspects of physical delivery, such as RSI location, quality control, and load-in and load-out rates, through detailed terms in the derivatives contract specifications or in the terms of the contract between the exchange and the warehouse. In some cases exchanges use both mechanisms. Derivatives contracts are designed to reflect as closely as possible practices in the underlying physical markets.

Delineating terms relating to physical delivery as part of the contract specifications may provide market participants with greater certainty compared to situations where delivery schedules are controlled exclusively via warehouse contracts. Additionally, regulators have greater authority over contract specifications than they do over contracts between exchanges and warehouses.

6. Exchanges may set maximum fees and rents that warehouses can charge for storing commodities. However, warehouses often give discounts or incentives to their customers and, as a result, customers may pay rents and fees that are significantly different from any standard price. Exchanges usually do not have detailed information or insight into the various discounts and inducements offered by warehouses (although some exchanges may be undertaking efforts to start gathering such information).

As warehouse discounts and incentives can influence customer behaviour regarding storage that may affect physical delivery and hence the overall market, this lack of information means there is a risk that exchanges may not be able to anticipate and discern emerging problems arising from storage arrangements in a timely manner.

7. In some instances, warehouse operators, derivative traders and exchange members are corporate affiliates belonging to the same corporate parent and undertake business related to the physical delivery of commodities traded on exchange. Some exchanges address this by requiring, for example, third party audits of governance and corporate structures at each warehouse. Good or sound practices could address the risk that conflicts of interest at warehouses raise the potential for one trader to have an unfair advantage (for example, preferential treatment or access to information) over others, thus harming the overall integrity of markets.
8. In some instances, information about warehouse operational parameters (for example, stocks and queue length) is not readily available to traders, regulators, or even exchanges. This paucity of information may hinder exchanges' and regulators' ability to discern emerging problems and react to them in a timely manner.

The Committee therefore recommends that Good or Sound Practices be developed to address the above concerns. Such Good or Sound Practices would reinforce industry best practices, provide further direction to exchanges and clearing houses in their rule and contract development and ensure RSIs fulfil their role in the commodity markets. Accordingly, further work should be conducted to examine the issues noted above with a view towards enhancing existing principles through the preparation of Good or Sound Practices.

ANNEX - Contract Design Principles¹⁵

- **Principle: Accountability** –Market Authorities should establish a clear framework as to design and review criteria or procedures for commodity derivatives contracts. Market Authorities should be accountable for compliance with statutory and/or self-regulatory standards on a continuing basis and should retain powers to address the provisions of existing contracts which produce manipulative or disorderly conditions. At a minimum a statutory Market Authority should have legal powers to address and where necessary to vary contract provisions which produce, or are deemed likely to produce, manipulative or disorderly conditions.

- **Principle: Economic Utility** - Contracts should meet the risk management needs of potential users and promote price discovery of the underlying commodity.

The design and/or review of commodity derivatives contracts should include a determination that the contract can meet the risk management needs of potential users of the contract and/or promote price discovery of the underlying commodity. The determination of economic utility may be supported by surveys of potential contract users or may be implied - for example, from an analysis of the physical market.

The regulator should, as a minimum requirement, be informed of the type of products to be traded on an exchange or trading system and should review and/or approve the rules governing the trading of the product.

- **Principle: Correlation with Physical Market** - Contract terms and conditions generally should, to the extent possible, reflect the operation of (i.e., the trading in) the underlying physical market and avoid impediments to delivery.
- **Principle: Promotion of Price Convergence through Settlement Reliability** - Settlement and delivery procedures should reflect the underlying physical market and promote reliable pricing relationship and price convergence and should be regularly evaluated to ensure that they meet this standard. Settlement and delivery terms should be specified and made available to market participants.
- **Principle: Responsiveness** - The views of potential contract users should be taken into account in designing commodity contracts.
- **Principle: Transparency** - Information concerning a physical commodity derivatives contract's terms and conditions, as well as other relevant information concerning delivery and pricing, should be readily available to Market Authorities with respect to all derivatives transactions within its jurisdiction and to market participants in organized derivatives markets and electronic execution facilities.

¹⁵

Principles for the Regulation and Supervision of Commodity Derivatives Markets (September 2011), p. 15 et seq. <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD358.pdf>.

The contract design principles collectively reflect best practices that help ensure that a commodity futures contract will be an effective economic tool for risk management and price discovery. In order to achieve that objective, a commodity futures contract must accurately reflect the characteristics and operation of the referenced underlying physical commodity market, and not contain factors which may inhibit or bias the delivery process.

The price of a commodity futures contract at expiry should reflect the value of the underlying physical commodity as specified in the terms of the commodity futures contract, plus or minus the costs associated with making or taking delivery, as well as any other clearly defined and known divergence between the futures contract's specifications and the contract's delivery basket. For physical delivery contracts, the possibility of delivery is the market force that usually causes convergence of physical and futures markets at expiry. However, there are instances where futures markets are susceptible to non-convergence of cash and commodity derivatives prices, as well as price distortion or manipulation, where there are impediments to making or taking delivery.