

# Strengthening the Infrastructure of Over-the-Counter Derivatives Markets

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## INTRODUCTION

Strengthening the infrastructure of over-the-counter (OTC) derivatives markets is a priority of policy-makers across the G-20 in their efforts to establish a framework for a safer, more resilient global financial system. While activity in OTC derivatives markets was not the immediate cause of the financial crisis,<sup>1</sup> certain features of these markets helped to amplify the crisis because of the size and interconnectedness of the major participants, the concentration and magnitude of bilateral counterparty credit exposures, and a lack of transparency regarding these exposures (Duffie 2010). The crisis demonstrated how rapidly concerns about the solvency of a large counterparty could spread across the network of participants and destabilize markets. Uncertainty regarding exposures to credit derivatives contributed significantly to the heightened concerns about counterparty risk that led to the failure (or near failure) of Bear Stearns, Lehman Brothers and American International Group (AIG) (Acharya and Richardson 2009; Brunnermeier 2009). The opacity of OTC derivatives markets also meant that regulators lacked the necessary information to respond to and resolve the events of the crisis.

Policy-makers around the world are championing reforms to OTC derivatives markets that will reduce bilateral counterparty credit risk, increase transparency, and “provide firewalls to help prevent the knock-on effects of an institution’s failure and allow shocks to be absorbed more easily” (IMF 2010). The leaders of the G-20 member countries have committed to an ambitious overhaul of OTC derivatives markets that aims, by the end of 2012, to increase the standardization and central clearing of OTC derivatives contracts; move trading onto exchanges or electronic trading platforms,

where appropriate; report all trades to trade repositories; and impose higher capital requirements for non-centrally-cleared contracts.

This report discusses how these reforms, by strengthening the infrastructure of OTC derivatives markets, can improve the resilience of financial markets and, hence, the safety of the financial system. It begins with a brief discussion of OTC derivatives markets, both globally and within Canada. The remainder of the report addresses what the reforms are intended to achieve, the progress made to date on implementing the reforms internationally and within Canada, and the main challenges for implementation.<sup>2</sup>

## OTC DERIVATIVES MARKETS

Since the mid-1990s, OTC derivatives markets have experienced considerable growth on a global basis, both in size and in the number and complexity of products. At the end of 2009, the notional amount outstanding in OTC derivatives, globally, was US\$615 trillion.<sup>3</sup> Interest rate derivatives account for the largest share of the market (83 per cent), followed by foreign exchange (FX), credit, equities and commodities (**Chart 1**).<sup>4</sup> A substantial share of the trading, globally, is conducted by a small number of dealers located in large financial centres, mainly in London and New York. Preliminary data from the 2010 Bank for International Settlements (BIS) triennial survey suggest

<sup>1</sup> The events of the financial crisis of 2007–09 are discussed in Acharya and Richardson (2009).

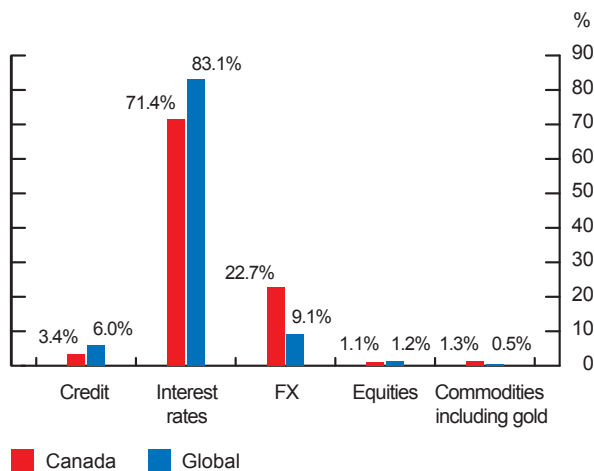
<sup>2</sup> A working group of the Financial Stability Board (FSB 2010) was mandated to make recommendations on the implementation of the G-20 objectives. The group examined how the objectives can be achieved consistently across jurisdictions while promoting greater use of OTC derivatives in standardized form.

<sup>3</sup> The notional amount outstanding is the value of outstanding contracts, which is used as the basis for determining payments on derivatives contracts. It is a useful measure for assessing market size and structure but should not be considered a measure of the riskiness of the positions. Definitions used by the Bank for International Settlements can be found in BIS (2007b).

<sup>4</sup> A more detailed breakdown is provided in OTC DWG (2010).

### Chart 1: Most OTC derivatives are in two asset classes: interest rates and foreign exchange

Share of gross notional amount outstanding, by asset class, end-2009



Sources: Bank for International Settlements and Canadian Market Infrastructure Committee (see OTC DWG 2010). Both sources include amounts that have not been allocated across asset classes. The percentages are based on totals adjusted to remove “unallocated” amounts.

that the United Kingdom and the United States, together, account for about two-thirds of the total turnover<sup>5</sup> in interest rate derivatives and 50 per cent of the turnover in FX derivatives.<sup>6</sup>

Similar to several other G-20 countries, Canada represents a small share of the OTC derivatives market (less than 2 per cent of the notional amount outstanding or US\$10.1 billion).<sup>7</sup> Reflecting the global nature of the market, Canada’s six largest financial institutions book nearly 40 per cent of their transactions (by notional value) outside of Canada, and those booked domestically often have a foreign counterparty on the other side of the trade. Overall, 80 per cent of transactions are booked in a foreign jurisdiction on at least one side of the transaction.<sup>8</sup> Relative to the global market, FX contracts are more widely used in Canada (23 per cent versus 9 per cent globally), partly reflecting the importance of FX swaps to the core funding of Canadian financial institutions (CFEC 2010; Terajima, Vikstedt, and Witmer 2010). As in the global market, the largest asset classes for OTC derivatives, by notional amount, are interest rates and FX (Chart 1).

<sup>5</sup> Turnover is a rough proxy for market liquidity, defined by the BIS as the absolute gross value of all deals concluded during the month, in notional value, divided by the number of trading days in that month.

<sup>6</sup> Preliminary survey results can be found in BIS (2010b).

<sup>7</sup> Data for the six largest Canadian banks as of December 2009. See OTC DWG (2010).

<sup>8</sup> The entity booking a trade in a foreign jurisdiction could be either a Canadian dealer’s foreign subsidiary or a foreign counterparty.

## NEED FOR REFORM

OTC derivatives can provide a substantial benefit to economic efficiency by enabling the effective management of business and operational risks. As the financial crisis revealed, however, certain features of OTC derivatives markets are in need of fundamental reform in order to make the financial system safer and more resilient to stress.

Trading of OTC derivatives is decentralized, and transparency is limited. Counterparties negotiate trades directly with each other over the phone or electronically, resulting in a market structure that is organized around an informal network of bilateral relationships. Market participants are exposed to counterparty credit risk (counterparty risk), which is the risk that a counterparty will default prior to the maturity of the derivatives contract and will not make the agreed-upon current and future payments. This risk is concentrated in a small group<sup>9</sup> of large, complex financial institutions that act as contract counterparties to each other and to other market participants.

Over the past 10 years, the industry has made considerable progress in improving the management of counterparty risk—for example, through the bilateral netting and posting of collateral on net exposures.<sup>10</sup> However, because risks are managed bilaterally, the risk that each trade imposes on the financial system is not taken into account in the setting of collateral and margin requirements (Acharya and Richardson 2009). Because the market is opaque to participants and regulators, it is possible for some participants to build up a large exposure that has not been sufficiently capitalized to mitigate the risk involved. Thus, market resilience can be adversely affected by inadequately managed counterparty risk, the opacity of the market, and post-trade infrastructure that has, at times, failed to keep pace with the rapid creation of new products and the rise in trading volumes.<sup>11</sup>

Events such as those leading to the rescue of the U.S. insurance firm, AIG, are a case in point.<sup>12</sup> AIG, through its subsidiary, AIG Financial Products, was able to sell protection on credit default swaps (CDS), linked to U.S. subprime mortgages, with a notional value of over US\$500 billion.<sup>13</sup> AIG’s AAA rating meant that it was not required to post

<sup>9</sup> Singh and Aitken (2009) report that, prior to the crisis, 90 per cent of the activity in OTC derivatives was handled by 10 large, globally active dealers.

<sup>10</sup> The industry, through the International Swap Dealers Association (ISDA), has created master agreements that allow for cross-product bilateral netting between two counterparties to reduce payment and close-out amounts (the latter refers to the amount that would be referenced in the event of bankruptcy). The increased use of collateral has been supported by the development of Credit Support Annexes to these agreements. Progress has also been made to eliminate redundant contracts outstanding (see IMF 2010).

<sup>11</sup> See BIS (2007a) and Ledrut and Upper (2007).

<sup>12</sup> The details of the AIG episode are complex and difficult to describe fully in this report. For a detailed account, see Sjostrom (2009).

<sup>13</sup> In return for a premium, a CDS contract provides insurance to the buyer against various credit events affecting an underlying bond or company. If a credit event (e.g., bankruptcy) is triggered, the seller of the protection must compensate the buyer of the CDS according to the terms of the contract.

collateral on its derivatives contracts. The firm was therefore able to accumulate an excessively large uncollateralized position. Furthermore, in contrast to the practices of most dealers, AIG did not hedge its positions using an offsetting exposure. As the financial crisis unfolded and the U.S. subprime-mortgage market deteriorated, large losses were incurred in the securities for which AIG had sold protection, requiring the firm to provide compensation. A subsequent downgrade in AIG's AAA credit rating triggered massive collateral calls on its OTC derivatives contracts that the firm was unable to meet. The potential knock-on effects of an AIG bankruptcy prompted the U.S. Federal Reserve to take action to prevent AIG's failure. While they may not have prevented AIG's difficulties, it is likely that the reforms proposed by the G-20 (e.g., increased transparency and appropriate incentives for managing the risks of OTC derivatives transactions) could have discouraged AIG from building up such large uncollateralized exposures.

## G-20 REFORM INITIATIVES

The weaknesses in market infrastructure that were exposed during the crisis motivated the G-20 leaders to commit to an ambitious overhaul of the infrastructure of OTC derivatives markets, stating that:

All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest; OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements.<sup>14</sup>

In some jurisdictions, efforts to implement these reforms are well advanced. The Japanese parliament has approved legislation requiring central clearing of OTC derivatives and trade reporting by 2012, and, in the United States, the recently enacted Wall Street Reform and Consumer Protection Act contains provisions regulating market participants and markets, including mandatory central clearing, exchange trading, real-time price transparency and higher capital charges for bespoke derivatives. Draft regulation for the mandatory clearing of OTC derivatives and reporting to trade repositories was introduced in Europe in September and is expected to be finalized in mid-2011. As well, there are plans to address trading venues in an amendment to the Markets in Financial Instruments Directive (MiFID) by mid-2011 at the latest. The progress made to date in Canada is outlined in **Box 1**. In the remainder of this report, we discuss the objectives of the reforms and the main challenges for implementation.

<sup>14</sup> These commitments, made at the Pittsburgh Summit in September 2009 (Group of 20 2009), were reconfirmed at the Toronto Summit in June 2010, at which time they were modified to address margin requirements for CCPs that take account of procyclicality, place somewhat greater emphasis on standardization and transparency, and stress the need for internationally consistent standards and implementation.

## STANDARDIZATION

The push for greater standardization of OTC derivatives is at the heart of the proposed reforms, because standardization is a necessary condition for central clearing and trading on an electronic trading platform or exchange. Other benefits of increased standardization include reduced operational risk, greater comparability of contracts (which reduces information asymmetry and improves valuation and risk management), facilitation of reporting and information sharing for regulatory purposes, and enhanced reliability of information (FSB 2010; CESR 2010).

Three aspects of standardization must be addressed to support the G-20 initiatives: product, legal and process standardization. Product standardization applies to the economic terms of the OTC derivatives contract—for example, contract size and maturity, collateral, delivery date, and delivery location. While there is considerable room to improve product standardization for the purposes of central clearing, some products are likely already sufficiently standardized to support exchange trading (e.g., benchmark credit default swap indexes). That said, there will continue to be a role for customized OTC derivatives contracts that provide important economic benefits to end users (FSB 2010).

Standardization of legal documentation and terms reduces the complexity of contracts, provides greater legal certainty and allows counterparties to focus on the negotiation of economic terms. Although further work is needed in this area, the industry, through ISDA, has made considerable progress in legal standardization across all asset classes. Significant accomplishments include those previously mentioned aimed at improving the management of bilateral counterparty risk, standard definitions for all asset classes and standard agreements that facilitate trade confirmations.

Process standardization is aimed at reducing operational risk by automating the various aspects of the different trading and post-trade processes. In exchange trading, post-trade steps are typically handled seamlessly within the exchange. In today's OTC derivatives markets, there can be many different systems involved in various aspects of post-trade processing (including manual processes) leading to operational inefficiency and risks. This has been a concern of regulators for some time, and much progress has been made in addressing this issue, including the reduction of confirmation backlogs for credit derivatives.<sup>15</sup>

For standardized OTC derivatives to be eligible for central clearing, authorities must also consider factors such as the depth and liquidity of the market in which the product is

<sup>15</sup> Since 2005, prudential supervisors of the largest global dealers have been actively working with the industry (the largest global dealers, ISDA, and, more recently, with buy-side participants) to address these issues. See <[http://www.newyorkfed.org/newsevents/news/markets/2010/100301\\_letter.pdf](http://www.newyorkfed.org/newsevents/news/markets/2010/100301_letter.pdf)>.

## Progress in Reforming Canadian Markets for OTC Derivatives

Canada has been working on both the international and domestic fronts towards the reform of OTC derivatives markets. Internationally, Canada has taken an active role in many areas of reform, including work with the Basel Committee on Banking Supervision (BCBS) on the capital framework to be applied to OTC derivatives transactions; standards for the safety and soundness of financial market infrastructure, including CCPs, now under review by the Committee on Payment and Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO); as well as the policy framework developed by the Financial Stability Board (FSB 2010). Domestically, an inter-agency working group (OTC DWG), chaired by the Bank of Canada, is developing policy options for Canada and has issued a discussion paper with preliminary recommendations for reform (see OTC DWG 2010).

The OTC DWG is composed of members from the Bank of Canada, the Federal Department of Finance, the Office of the Superintendent of Financial Institutions (OSFI), the Ontario Securities Commission (OSC), the Autorité des marchés financiers (AMF), and the Alberta Securities Commission (ASC). In order to develop a sound regulatory framework for OTC derivatives, securities regulators must have the appropriate legislative authority. The Canadian Securities Administrators (CSA), a national coordinating body for the provincial securities regulators, issued a consultation document in November containing high-level proposals regarding the regulation of OTC derivatives (CSA 2010). The report states that “clear jurisdictional authority in each province, as well as specific rule-making powers, need to be set out in provincial securities and derivatives legislation” (p. 56). Consistent with this, Ontario’s draft

Bill 135 (released in November) contains proposed amendments to the Ontario Securities Act that would establish a regulatory framework for trading in derivatives. The proposed Canadian Securities Act, released by the Government of Canada in May 2010, establishes a broad framework for the regulation of OTC derivatives under the Canadian Securities Regulatory Authority.

The official sector in Canada is working closely with stakeholders in OTC derivatives markets, including dealers, buy-side participants and service providers, both domestically and internationally. The Canadian Market Infrastructure Committee (CMIC) was formed to examine, from an industry perspective, the various issues related to the implementation of the G-20 commitments for OTC derivatives and to make recommendations to public authorities. Given the industry’s crucial role in the implementation of these reforms, this is a very welcome development. The CMIC and OTC DWG are currently assessing how Canadian market participants might access central clearing for OTC derivatives, focusing on three options: (i) expanded global CCP offerings to include a broader range of Canadian-dollar products; (ii) the establishment of a stand-alone Canadian CCP with linkages to regional or global CCP(s); and (iii) the establishment of a Canadian CCP that would be an affiliate of an established global CCP. The official sector has also engaged the CMIC on other aspects of reform, including the standardization of OTC derivatives products, trade repositories and increased transparency in OTC derivatives markets.

traded and the availability and reliability of pricing (FSB 2010). This information is necessary to ensure that a CCP can effectively manage a contract’s risks. To implement the G-20 commitments, authorities will need to work with market participants to determine which products are suitable for central clearing. It is necessary to set ambitious targets to discourage the industry from using customized contracts in order to avoid clearing and also to monitor the progress made in meeting the G-20 commitments.

## BENEFITS AND CHALLENGES OF CENTRAL COUNTERPARTY CLEARING

Implementation of the G-20 commitments related to central clearing will require international coordination to ensure non-discriminatory access for all G-20 members and to ensure that the reforms achieve the intended objectives of enhancing the safety and resilience of the global financial system. As discussed in Chande, Labelle, and Tuer in this *Review*, the increased use of CCPs can reduce systemic risk through a number of channels. Aside from reducing the counterparty risk assumed by major market participants



and the uncertainty regarding market-wide counterparty risk exposures, increased use of central counterparties would reduce the propagation of financial stress across the network of major market participants.<sup>16</sup> A CCP with proper risk-mitigation mechanisms would, in conjunction with other reforms, help ensure that the failure of an individual institution would not jeopardize systemic integrity and market confidence.

That said, CCPs that clear OTC derivatives transactions can pose a number of additional challenges for risk management compared with CCPs that clear cash-based securities and, to some extent, exchange-traded derivatives.<sup>17</sup> First, unlike cash-based securities that settle in one or two days, OTC derivatives often have long contract maturities over which the CCP must manage the associated risks. Second, it can be more challenging to calculate the margin required to cover risks given that some OTC derivatives markets lack liquidity and reliable consensus pricing and that the contracts may have non-linear payoffs. Finally, CCPs that clear OTC derivatives are relatively new or non-existent for some asset classes and most products, while CCPs for cash products have a longer history. As a result, in many cases, best practices for risk management, third-party clearing and oversight have yet to be developed and are largely untested for OTC derivative CCPs.<sup>18</sup> The CPSS-IOSCO review of standards for financial market infrastructure will set the bar for the risk management of this important infrastructure.

The global nature of OTC derivatives markets and the economics of clearing pose additional challenges for ensuring relatively low-cost and broad access to CCP services, within an appropriate risk-control framework. This is because only a relatively small number of financial institutions may be large enough to have direct access to central clearing services, with smaller financial institutions and buy-side participants being required to clear indirectly through these large institutions. These challenges are particularly important for smaller jurisdictions, such as Canada and Australia, that are located outside of the main financial centres in which most OTC derivatives contracts are booked.

Access to central clearing for Canadian financial institutions and buy-side participants could, in principle, be achieved either through participation in global CCPs or through the development of a domestically domiciled CCP (either a Canadian CCP or an affiliate of a global CCP) that establishes links to a global CCP (see **Box 1**). Given the global nature of OTC derivatives activity in most asset classes, a stand-alone Canadian-domiciled CCP (i.e., a Canadian-domiciled CCP that was not linked to a global CCP) would not likely be viable.<sup>19</sup>

<sup>16</sup> See Brunnermeier (2009); Duffie, Li, and Lubke (2010); and Caballero and Simsek (2009).

<sup>17</sup> See Glass (2009) and Ledrut and Upper (2007).

<sup>18</sup> This is reflected in the work under way internationally to revise and develop new standards for financial market infrastructures such as CCPs (FSB 2010).

<sup>19</sup> An exception to this are equity-based derivatives, which are mainly traded locally.

In assessing these options, it is important to consider several factors that are relevant for risk reduction and efficiency. These include the degree to which exposures would be reduced through netting, the mechanism available for Canadian authorities to ensure that CCPs clearing Canadian products and serving Canadian financial institutions are properly overseen and risk-proofed, and the safe and cost-effective design of links between CCPs, should links be required. It is also essential to consider how the clearing of Canadian products by CCPs would be prioritized now and in the future under different access options in order to foster resilient markets and healthy innovation. These options must also be assessed in terms of their implications as to whether Canadian OTC derivatives dealers are able to retain their ability to compete in the global marketplace. Finally, it will be important to consider how CCPs clearing Canadian products could obtain effective access to extraordinary Canadian-dollar liquidity from the Bank of Canada.

## INCREASING TRANSPARENCY IN OTC DERIVATIVES MARKETS

As discussed earlier, the lack of transparency in OTC derivatives markets made it difficult for regulators and market participants to recognize the buildup of risks prior to the crisis and to respond to and resolve the events of the crisis. Transparency can be improved through the establishment of trade repositories (TRs), which are a new form of market infrastructure. TRs are centralized, electronic registries of transaction records for all OTC derivatives contracts that provide a consistent, credible source of data on OTC derivatives.<sup>20</sup>

The advantage of TRs is that they can provide regulators with a complete picture of the exposures of large market participants by requiring that all trades be reported, including non-centrally-cleared trades. At present, there are three TRs in operation: Warehouse Trust, a TR for credit default swaps operated by DTCC-Derivserv; Tri-Optima's TR for interest rate derivatives; and DTCC's TR for equity derivatives. A TR can provide regulatory authorities with the timely and reliable information required to: (i) assess risks on the books of market participants, particularly systemically important financial institutions; (ii) identify and monitor the buildup of concentration risks; (iii) support the enforcement of regulations for market conduct; and (iv) address risky market practices. A TR can also increase transparency to the market through public reporting of data such as aggregated live positions, transaction activity, aggregate settlement data, and (delayed) transaction-level pricing. The benefits provided by a TR are, however, contingent on the TR being able to access information on the overall market, as would be the case if one global TR were to be developed for each asset class. At the same time, this

<sup>20</sup> See BIS CPSS-IOSCO (2010a) and FSB (2010).

poses various challenges for cross-border oversight of the TR, should coverage of, or access to, relevant transactions in offshore TRs be inadequate.

Moving OTC trading to exchanges is one way of increasing market transparency for those OTC derivatives that are sufficiently standardized and liquid. Trading on exchanges increases both pre-trade and post-trade transparency to market participants, because, on an exchange, participants have access to firm quotes and real-time information on trade prices.<sup>21</sup> This type of price transparency has the potential to improve market efficiency, as well as levelling the playing field for market participants, thus offering greater protection to unsophisticated or uninformed market participants. Electronic trading platforms<sup>22</sup> can also increase transparency for trades in OTC derivatives, typically by offering limited pre-trade transparency and indicative quotes (for example, to a smaller group of market participants than would be the case with a regulated exchange).

Any regime for improved price transparency imposed on OTC derivatives markets would have to be designed to minimize its potential negative impact on liquidity, since some forms of price transparency could impair dealers' market-making ability, thus withdrawing liquidity from the market.<sup>23</sup> A potential reduction in aggregate hedging capacity is also possible if market-making activity is shifted away from customized OTC contracts in favour of standardized exchange contracts.<sup>24</sup> The appropriate trading venue and level of transparency are thus dependent on a number of factors, including the depth of liquidity, and should be carefully considered before imposing rules. To assist local authorities in this effort, the IOSCO Task Force on OTC Derivatives Regulation is evaluating the benefits and the challenges of implementing measures aimed at increasing exchange and electronic trading and assessing the appropriateness of drafting international standards.

## CONCLUSION

The reform of OTC derivatives markets is a major initiative of G-20 countries, designed to increase the resilience of the global financial system by reducing bilateral counterparty credit risk, reducing operational and legal risks, and increasing transparency to both financial market participants and regulators. Reform is well under way in many jurisdictions, including the United States, Japan and Europe. Canada has been working on both the international and domestic fronts towards the reform of OTC derivatives

markets. The official sector in Canada, including the Bank of Canada, Finance Canada, OSFI, the OSC, the AMF and the ASC, is working in a coordinated manner with stakeholders in OTC derivatives markets, including dealers, buy-side participants and service providers, both domestically and internationally. The scope of the reforms is broad and will profoundly change the architecture of OTC derivatives markets. Achieving the implementation deadline (the end of 2012) is ambitious and will require a concerted effort on the part of the official sector and the industry. Finally, ongoing monitoring will be required to ensure that this important infrastructure is developed in a manner that contributes to the safety and resilience of the global financial system.

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<sup>21</sup> Pre-trade transparency refers to publishing quotes and orders for transactions, while post-trade transparency is reporting on the details of completed trades (FSB 2010).

<sup>22</sup> See FSB (2010) for a discussion of the features of exchanges and electronic trading platforms.

<sup>23</sup> See, for example, Financial Services Authority and HM Treasury (2009).

<sup>24</sup> The price at which dealers offer customized contracts is likely to be higher if they find it more difficult to reduce the risk related to these contracts as volumes move to more standardized OTC or exchange-traded contracts.

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