

# The role of oversight in collecting derivatives data

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## 1. Overview

Derivatives transactions are an important part of the financial markets. For this reason, the market infrastructures supporting the trading, clearing and settling of derivatives transactions, in particular trade repositories and central counterparties, play an important role in contributing to the transparency, the safety and the efficiency of derivatives markets. This, in turn, enhances the stability of the financial system.

This article, after a brief look at derivatives transactions and the market structure of the derivatives markets, will first discuss the risks in clearing and settling derivatives transactions, then look at the market infrastructure supporting derivatives markets, mention the new international standards for financial market infrastructure and discuss the role of oversight. It will then focus on the collection of data on derivatives markets, including the derivatives statistics published by the Bank for International Settlements (BIS).

## 2. Derivatives transactions

A derivatives transaction is a financial contract whose value depends on the values of one or more underlying reference assets, interest or exchange rates, or indices. In a schematic way, all derivatives can be divided into components of forward contracts, options or combinations of these. In a forward contract, one counterparty agrees to buy, and the other counterparty agrees to sell, a specific amount of an underlying asset at a specific price on a specific date in the future. In an option contract, the buyer pays a premium to the seller in return for the right, but not the obligation, to buy or sell a specific amount of the underlying asset at a specific price during a specific period or on a specific date.

Derivatives transactions can be settled in two ways: either through delivery of the reference asset or through cash settlement, ie a payment from one counterparty to the other that equals the loss (and gain to the other) from the change in the value of the contract between the transaction date and the settlement date. Certain contracts (such as interest rate swaps and credit default swaps) may also obligate counterparties to make periodic cash payments prior to the maturity (or expiration) date of the contract.

## 3. Market structure

Derivatives transactions can be traded over the counter and on exchanges. Over-the-counter (or OTC) derivatives are privately negotiated transactions that typically are executed electronically or by telephone. These contracts are offered internationally by dealers to end-users and other dealers. Brokers may be used to find counterparties, but the brokers are not themselves counterparties to the transactions. The dealers are primarily large international

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financial institutions – mostly banks but also some securities firms and insurance companies. End-users include, for example, banks, insurance companies, pension funds, hedge funds and non-financial corporations. Counterparty risk management and settlement occur on a bilateral basis.

Exchange-traded derivatives are transacted on a central trading floor or (in most cases) through an electronic trading system. They are then cleared and settled centrally through the exchange's clearing house, which acts as central counterparty (or CCP) to all the contracts. The economic terms of exchange-traded contracts – the underlying assets, amounts, delivery or expiration dates and the prices at which options can be exercised – are standardised. Counterparty risk management also has standardised features: clearing members are subject to common membership requirements and to margin (or collateral) requirements. The standardisation of the terms of the contracts tends to make exchange-traded contracts more liquid than OTC derivatives transactions.

#### **4. Risks in clearing and settling derivative transactions**

There are significant differences in the risk profiles of derivatives traded bilaterally and those traded on an exchange. We will look first at OTC derivatives and then at derivatives traded and settled in a centralised market with a CCP.

##### **OTC derivatives**

Counterparties to OTC derivatives transactions are subject to the same basic types of risk as counterparties to any other financial transactions: credit risk, liquidity risk, market risk, legal risk, operational risk and custody risk. Losses to OTC counterparties from these sources can, as seen in the recent financial crisis, be so severe as to pose systemic risks to financial markets and, more generally, the financial system.

##### ***Credit risk***

Credit risk, or counterparty credit risk, is the risk of loss from default by the counterparty, typically as a consequence of its insolvency. Two types of credit risk can be distinguished: (i) replacement cost (sometimes called pre-settlement risk) – the loss from replacing open contracts with the defaulting counterparty; and (ii) settlement risk (also called principal risk) – the risk of loss on payments or deliveries from the defaulting counterparty.

##### ***Replacement cost risk***

In the event that an OTC derivatives counterparty defaults before settlement, the non-defaulting counterparty would typically seek to close out each of its contracts with the defaulting counterparty and replace them with contracts on the same terms with another counterparty. The replacement cost risk is the risk that the non-defaulting counterparty will incur a loss in replacing the contract. Such a loss will occur only if, at the time of default, the OTC derivatives contract has a positive market value to the non-defaulting counterparty.

##### ***Settlement risk***

Settlement risk is a concern only for those OTC derivatives contracts that provide for an exchange of payments (for example, most foreign exchange contracts) or for delivery of the reference asset in exchange for payment (for example, commodity forward contracts). Even for these types of contract, settlement risk can be mitigated if there is a payment-versus-payment or delivery-versus-payment mechanism for the currencies or reference asset in question. Thus, in practice, settlement risk is an issue primarily for certain physically settled

contracts. Where settlement risk exists, the potential loss in the event of a default of the counterparty equals the full principal value of the contract.

### ***Liquidity risk***

Liquidity risk is the risk that a counterparty will experience demands for funds (or collateral) that it cannot meet when due. In most respects, liquidity risks associated with OTC derivatives are in nature no different from liquidity risks associated with other obligations. In some circumstances OTC derivatives could give rise to significant liquidity pressures. For example, the fact that many OTC transactions are collateralised can be a potential source of liquidity demands: a significant decline in the value of an OTC derivatives portfolio could result in substantial demands for collateral and thus substantial liquidity pressures.

### ***Market risk***

Market risk is the risk of loss from adverse movements in the level or volatility of market prices of assets. Market risk can only be analysed in a meaningful way on a portfolio basis, taking into account offsetting positions in specific underlying risk factors (eg interest rates, exchange rates or commodity prices) and correlations among those risk factors.

### ***Legal risk***

Legal risk is the risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced. A contract may be invalid or unenforceable for various reasons. For example, the counterparty or the counterparty's signatory lacks the capacity or authority to enter into the contract; or the documentation supporting a transaction could contain invalid terms or fails to meet local legal standards and may therefore be unenforceable in whole or in part.

### ***Operational risk***

Operational risk is the risk that deficiencies in information systems or internal controls could result in unexpected losses. Operational risk is inherent in any financial activity, but is especially significant in the case of OTC derivatives. Timely and accurate information is critical to the management of credit risks and market risks associated with OTC derivatives. However, the capture of data on OTC derivatives is often a manual process and therefore subject to error and delays.

### ***Custody risk***

Custody risk is the risk of loss of securities held with a custodian as a result of insolvency, negligence or fraudulent action by the custodian. In OTC derivatives transactions, custody risk arises principally under collateral agreements in which collateral taken is held by the counterparty receiving the collateral or by a third-party custodian.

### ***Systemic risk***

Systemic risk is the risk that the failure of a counterparty to meet its obligations when due will cause other counterparties to fail to meet their obligations when due. Of particular concern is the possibility that the resulting liquidity and credit problems could be so severe that the liquidity of key financial markets could be impaired or payment and settlement systems could be disrupted. Because OTC derivatives transactions are a major source of credit exposures between the largest global institutions, financial difficulties in one of these institutions could lead to shocks to the entire financial system.

## **Exchange-traded derivatives**

Derivatives that are traded on an exchange are typically cleared through a CCP: a CCP interposes itself between two counterparties to a trade, becoming the buyer to every seller and the seller to every buyer. The exact risks that a CCP must manage depend on the specific terms of its contracts with its participants. Nevertheless, many CCPs face a common set of risks that must be managed effectively. There is the risk that participants will not settle obligations either when due or at any time thereafter (counterparty credit risk) or that participants will settle obligations late (liquidity risk).

If a commercial bank is used for money settlements between a CCP and its participants, failure of the bank could create credit and liquidity risks for the CCP (settlement bank risk). Other risks potentially arise from the taking of collateral (custody risk), the investment of clearing house funds or cash posted to meet margin requirements (investment risk), and deficiencies in systems and controls (operational risk). A CCP also faces the risk that the legal system will not support its rules and procedures, particularly in the event of a participant's default (legal risk). Though many of these risks apply equally to OTC derivatives, there are a few important differences, as explained below. Since market, legal and operational risk are similar in both cases, they are not mentioned again.

### ***Credit risk***

A CCP is exposed to the risk of loss from default by a participant. As before, credit risk has two dimensions: replacement cost risk and settlement risk.

If a participant were to default, a CCP typically would terminate the defaulter's contracts. To do so a CCP would enter the market and purchase or sell contracts identical to those held by the defaulting participant. The size of the loss (or gain) will depend on the volatility of the contract prices, the amount of time that has passed between trade dates and default, and the size of the positions being replaced. However, margin requirements (ie the posting of collateral to cover exposures) and the contributions to the default fund will usually limit losses in the event that a participant defaults. A CCP also faces settlement risk: potentially it could incur large credit exposures on settlement days when the full principal value of transactions is at risk.

### ***Liquidity risk***

Depending upon the terms of its contracts with its participants, a CCP may have an obligation to make a wide variety of payments. Since a CCP must continue operating and fulfil its payment obligations to non-defaulting participants on schedule, even if it faces one or more participant defaults or operational difficulties, a CCP is exposed to liquidity risk. A CCP has a range of resources it can use to fulfil its payment obligations. These include assets of the defaulting participant posted with the CCP as well as the CCP's own capital and possibly the assets of non-defaulting participants. But often these resources are non-cash assets. Such assets must be liquidated in order for a CCP to meet its obligations, and this process may be difficult or costly to complete in the time required.

### ***Custody risk***

Typically a CCP will manage its credit risk by requiring that participants post margin to cover their exposures. This generates custody risk. Similarly, if a CCP invests its capital in securities that are held at a custodian, custody risk will arise. The custodian may act negligently, commit fraud or become insolvent, resulting in the loss of the collateral.

### **Settlement bank risk**

In addition to the risk associated with a counterparty's default, a CCP runs the risk that the bank providing cash accounts for money settlements with its participants may fail. This would create credit and liquidity pressures for a CCP, the size of which will be dependent upon the amounts flowing through the failed bank, the timing of the bank's failure, and the terms of the settlement agreement between a CCP and a settlement bank.

### **Investment risk**

A CCP has resources such as equity and reserves that are typically invested in order to generate revenues. These funds are usually placed in very short-term bank deposits or securities. A CCP therefore faces credit and liquidity risks with respect to the banks or issuers of these securities. If a CCP has a programme to invest cash deposited as margin, a similar investment risk would arise.

## **5. Market infrastructure supporting derivatives markets**

Trade repositories (TRs) and central counterparties (CCPs) are the main elements of the infrastructure underpinning both the exchange-traded and the OTC derivatives markets. They therefore play an important role in strengthening the core financial infrastructure for derivatives transactions. In addition to enhancing the safety, TRs and CCPs make important contributions to the transparency and the efficiency of derivatives markets.

### **Trade repositories**

#### ***The role of trade repositories***

A TR is a centralised registry that maintains an electronic database of the records of transaction data. They are a fairly new type of market infrastructure and have recently grown in importance, particularly in the OTC derivatives markets. By centralising information on outstanding transactions, they help to improve the transparency of the derivatives markets. A well designed TR provides an effective mechanism to collect and distribute market data to both the relevant authorities and the public. A TR could also engage in the management of trade life-cycle events and, provided that the records are standardised, could facilitate downstream trade processing services based on the records it maintains.

For exchange-traded derivatives, the transaction data is kept by the exchange. For OTC derivatives, however, the individual counterparties to a trade keep the records of the transaction themselves, often in proprietary systems. Unless, of course, both counterparties make use of a TR to maintain transaction data. Moreover, other entities providing services to market participants, such as prime brokers, trading platforms, custodians and CCPs, might also maintain transaction records.

#### ***Risk management***

TRs play a key role in the post-trade infrastructure supporting the derivatives markets. Given this importance, the need for international standards applicable to TRs became clear a few years ago, when the Committee on Payment and Settlement Systems (CPSS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) decided to develop policy guidance for TRs. Their findings were published in May 2010 as a consultative report titled *Considerations for trade repositories in OTC derivatives markets*.

This report analyses the most important risks associated with TRs and gives a list of factors that should be considered by TRs in designing and operating their services. These factors are aimed at the function of keeping centralised records, whether this function is performed by a TR or by another service provider. The factors outlined in the report should also be considered by the relevant authorities, in particular central banks and market regulators, in overseeing and regulating TRs.

## **Central counterparties**

### ***The role of central counterparties***

A CCP is a legal entity that interposes itself between the buyer and the seller. Trading is not affected by the presence of the CCP. When both sides of a trade are matched, the information is sent to the CCP for registration and the counterparties receive a notification. The trades are then entered into the CCP through a legally binding arrangement (such as novation), whereby one contract between two initial counterparties is replaced with two new contracts, one between each counterparty and the CCP. This process allows the CCP to perform multilateral netting of both exposures and payments.

Historically, CCP arrangements – most of them supporting exchange-traded products – have performed well: CCPs have made an important contribution to a reduction in risk. Thus, the idea of extending the use of CCPs to OTC derivatives markets has gained ground in recent years.

### ***Risk management***

A CCP's risk mitigation capacity is determined by two key elements. First, the parties using the CCP for their transactions have put capital into the CCP. Second, a CCP typically requires the posting of initial collateral to cover the potential future exposure of open contracts with each of its participants. More collateral will be needed for positions whose market value is more volatile. In addition, positions are marked to market at least daily and variation margin is paid and received by participants each day in the currency of the position.

A well designed CCP with appropriate risk management arrangements reduces the risks run by its participants. At the same time, however, there is a concentration of risks and responsibilities for risk management at the level of the CCP. This means that the effectiveness of the CCP's risk control and the adequacy of its financial resources are crucial for the safety of the financial market the infrastructure serves. For this reason, central banks and securities regulators have a strong interest in the risk management of CCPs. That is why the CPSS and the IOSCO Technical Committee published *Recommendations for central counterparties* in 2004. This report sets out 15 comprehensive and detailed standards for the risk management of a CCP. These recommendations, it should be mentioned, were essentially conceived for CCPs clearing exchange-traded derivatives.

Because of the nature of the OTC markets, ensuring that CCPs for OTC instruments are safe presents unique challenges in comparison with the existing CCPs for exchange-traded products. That is why the application of the 2004 Recommendations to CCPs for OTC derivatives involved a significant degree of interpretation and judgment. For this reason the CPSS and IOSCO published a consultative report, *Guidance on the application of the 2004 CPSS-IOSCO recommendations for central counterparties to OTC derivatives CCPs*, which was published in May 2010. The report analyses key issues that arise when CCPs clear OTC derivatives and it develops new guidance on how these CCPs should implement the 2004 recommendations.

## **6. New international standards for FMIs**

In the beginning of 2010 the CPSS and IOSCO's Technical Committee launched a general review of the international standards for financial market infrastructures (FMIs). Though FMIs performed well during the recent financial crisis, events surrounding the crisis highlighted important lessons for effective risk management. These lessons, along with the experience gained by implementing the existing international standards, led to an update of the standards for FMIs. The resulting report, *Principles for financial market infrastructures*, was issued for public consultation in March 2011.

The standards in this new report harmonise and, where appropriate, strengthen the existing international standards for payment systems that are systemically important, central securities depositories, securities settlement systems, and central counterparties. The revised standards also incorporate the additional guidance for OTC derivatives CCPs and trade repositories that was released in 2010.

## **7. The role of oversight**

Because TRs and CCPs are critical components of the financial markets, their soundness is crucial to maintaining financial stability, especially in times of high market stress. In order to ensure the safety of these systems, TRs and CCPs are subject to regulation, supervision and oversight by national authorities such as the central bank, the securities (or market) regulator and other relevant bodies. The division of responsibilities amongst these authorities depends to a large extent on the legal and institutional framework applicable in the country where the market infrastructure is based.

Oversight of FMIs is a central bank function that has the objective of promoting safety and efficiency. This is achieved by monitoring planned and existing systems, by assessing these systems against international standards (such as the above-mentioned Principles for FMIs) and by inducing change if the systems do not comply with those standards. For FMIs supporting securities markets (such as TRs and CCPs) this responsibility is shared with securities regulators.

## **8. Collecting data on derivatives markets**

In order to effectively carry out their responsibilities to regulate, supervise and oversee, central banks and market regulators should have specific powers, in particular the ability to obtain information. Authorities should have appropriate powers to access information that enables them to understand and assess the FMI's activities, its risk management policy and its adherence to the relevant regulations and standards. Key sources of information include publicly available information, official system documentation, regular or ad hoc reporting on system activity, internal reports from board meetings and internal auditors, bilateral meetings and on-site inspections. Regular or ad hoc reporting is a particular useful source of information: it refers to reports on the daily volume and value of transactions, reports on the performance of the daily operations, results from stress tests and the scenarios and methodology used in estimating exposures.

It is worth mentioning that the recently published CPSS-IOSCO *Principles for financial market infrastructures* contain one principle on the disclosure of market data. Principle 24 states that a TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs. The data should be comprehensive and sufficiently detailed in order to enhance market transparency and to support other public policy

objectives. Furthermore, a TR should have effective processes and procedures to provide data to relevant authorities to enable them to meet their respective regulatory mandates and legal responsibilities. Finally, the data should be provided in a format that permits it to be easily analysed.

In addition to this general overview concerning the collection of market data from FMIs, the sections below give some specific information on data gathering with respect to derivatives transactions. It focuses on FMIs that serve the derivatives markets and provides a few examples of TRs and CCPs. Finally, the role of the BIS in compiling and publishing derivatives statistics is mentioned.

### **Trade repositories**

Today, the most important TR for OTC credit derivatives is the Trade Information Warehouse established by the Depository Trust & Clearing Corporation (DTCC). It provides almost complete coverage of outstanding standardised single- and multi-name credit default swaps (CDS) contracts worldwide. Less standardised CDS contracts are not covered. The Warehouse facilitates the processing of various lifecycle events, such as, for example, the quarterly payments that occur over the contractual lifetime of a CDS. DTCC publishes weekly information on notional amounts outstanding, by counterparty type, on both a gross (before netting) and net (after netting) basis for individual reference entities. This increases market transparency and provides useful data to the regulatory authorities on the markets and the positions of major traders.

There are also trade repositories for interest rate and equities derivatives: the OTC Derivatives Interest Rate Trade Reporting Repository (IR TRR) collects transaction data on interest rate derivatives from market participants and provides regulators with monthly reports summarising outstanding trade volumes and gross notionals as well as currency breakdowns and maturity profiles by product type.

Regarding equities derivatives, the Equity Derivatives Reporting Repository (EDRR) holds key position data, including product types, notional value, open trade positions, maturity and currency denomination for participants' transactions, as well as counterparty type. The service supports OTC equity derivatives products such as options; equity, dividend, variance and portfolio swaps; and contracts for difference. By aggregating and maintaining the data, EDRR prepares reports that keep market participants and regulators informed on the notional values of outstanding contracts and positions as well as other position-related information.

### **Central counterparties**

There are many well established CCPs for exchange-traded derivatives. On their websites these CCPs, which are often called clearing houses, provide information to the general public on the clearing and settlement activity taking place through their infrastructure. In addition, they also provide detailed data to the regulatory authorities. It should be noted that the exchanges themselves also provide information on the trading activity taking place in the many products they offer, including derivatives.

The number of CCPs that clear OTC derivatives is limited. With one exception – SwapClear – all such CCPs were launched fairly recently. SwapClear, a CCP for interest rate swaps, was established in 1999 to reduce counterparty and operational risk and to economise on the use of collateral for the major inter-dealer swap traders. It initially provided clearing for plain vanilla interest rate swaps in a few major currencies. Since then, the range of products, currencies and maturities cleared has been expanded to include 14 currencies and 22 indices. The other CCPs of this type offer clearing services for interest rate swaps and credit default swaps.

## **BIS derivatives statistics**

### ***Semiannual OTC derivatives statistics***

In June 1998 central banks of major financial centres started reporting to the BIS semiannual OTC derivatives statistics on forwards, swaps and options of foreign exchange, interest rate, equity and commodity derivatives. As of end-June 2004, the BIS also releases statistics on concentration measures, going back to June 1998. The data include concentration measures for foreign exchange, interest rate and equity-linked derivatives. Finally, as of end-December 2004, the BIS releases semiannual data on credit default swaps including notional amounts outstanding and gross market values for single- and multi-name instruments. Additional information on CDS by counterparty, sector and rating has been made available as of December 2005. As of end-June 2010 more granular information is published on CDS counterparties (eg CCPs and hedge funds) as well as on index products in the multi-name CDS instruments.

The objective of the semiannual OTC derivatives markets statistics is to obtain comprehensive and internationally consistent information on the size and structure of derivatives markets in the major industrialised countries. They provide data on notional amounts outstanding and gross market values and permit the evolution of particular market segments to be monitored. The data are updated and published every six months and are available in electronic form on the BIS website ([www.bis.org](http://www.bis.org)).

### ***Statistics on exchange traded derivatives***

The statistics on exchange-traded derivatives, compiled since 1986 and derived from various market sources, mainly cover turnover and open interest in both number of contracts and notional amounts. The value added by the BIS consists of aggregating highly detailed contract-level information according to specific standard criteria such as market risk categories, instrument types and location of trade. In addition, the BIS also calculates the notional amounts of the contracts which, in the case of the equity instruments, require tracking and maintaining a growing list of stock indexes.

The main purpose of the exchange traded derivatives statistics is to obtain extensive information of the size, structure and development of futures and options markets so as to complement and reinforce other more traditional sets of financial statistics compiled by the BIS. The data are updated and published every quarter and are available in electronic form on the BIS website. Further information on the BIS framework for monitoring financial derivatives can be found in von Kleist (2011).

## **9. Conclusion**

This article presents an overview of the infrastructure supporting derivatives markets, with special emphasis on TRs and CCPs, and the risks occurring in the clearing and settlement of derivatives transactions. It discusses the international standards for financial market infrastructures that have been developed recently and the role these infrastructures play in collecting statistical data on derivatives markets.

In collecting derivatives data as part of their oversight and regulatory responsibilities, central banks and securities regulators can obtain a more complete picture of the derivatives market, and in particular with respect to the size and the nature of the risk exposures of the major market participants. This allows the authorities to monitor the risks and, when necessary, to take preventive measures to mitigate the risks run by the financial sector. In gathering and using statistical data, authorities can therefore make a significant contribution to maintaining and enhancing the stability of the financial markets, and more widely, the financial system.

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