

OTC-Cleared Derivatives: Benefits, Costs, and Implications of the “Dodd-Frank Wall Street Reform and Consumer Protection Act”

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Derivatives that are negotiated over-the-counter (OTC), but cleared and settled through central counterparties have grown in popularity since their first appearance in the 1990s. Such “OTC-cleared” derivatives have both benefits and costs that can vary significantly across market participants and product types. This article explores the evolution of OTC-cleared derivatives and those benefits and costs. Particular attention is paid to the regulatory framework for OTC derivatives, which was recently substantially overhauled with the adoption of the Dodd-Frank Wall Street Reform and Consumer Protection Act. Under the new Act, the clearing and settlement of many OTC derivatives through a central counterparty (CCP) is now mandatory. The challenges and risks likely to arise from these new regulations are also explored here for clearinghouses, swap dealers, and major users of OTC derivatives.

■Over-the-counter (OTC) derivatives contracts like interest rate and credit default swaps are negotiated bilaterally and subject their users to the risk of counterparty default. Derivatives participants have historically managed those credit exposures through the use of master netting agreements, collateral requirements, periodic cash resettlement, and other forms of bilateral credit enhancements.

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Beginning in the late 1990s, several major derivatives clearinghouse organizations began to provide clearing and settlement services for OTC derivatives to help market participants manage their credit exposures. These “OTC-cleared derivatives” are negotiated privately and off-exchange and rebooked into a clearinghouse on a post-trade basis. The clearinghouse then acts as a central counterparty (CCP) to the transactions, much like the clearing and settlement process for traditional exchange-traded futures and options.

Commercial interest in OTC-cleared derivatives grew substantially in the energy derivatives market following the bankruptcy of Enron in late 2001. By 2002, both the New York Mercantile Exchange and the InterContinental Exchange had introduced clearing solutions for OTC energy derivatives. Since then, OTC-cleared derivatives volume has grown steadily in those and several other clearinghouses. OTC-cleared derivatives now include interest rate, equity, commodity, and, most recently, credit products.

Despite significant growth in OTC-cleared derivatives volumes, many market participants still preferred traditional OTC derivatives (with bilateral credit risk management) or exchange-traded derivatives. OTC-cleared derivatives thus emerged as a “third category” of derivatives without displacing the other two. The appeal of OTC clearing, moreover, varied across product types, regulatory jurisdictions, and market participants.

In the wake of the credit crisis of 2007 and 2008, Washington suddenly developed an elevated interest in CCP clearing and settlement solutions for OTC derivatives.¹ In particular, the

¹ Then-President of the Federal Reserve Bank of New York Timothy Geithner had been advocating centralized clearing and settlement for certain OTC derivatives since at least 2004.

involvement of credit default swaps (CDSs) in the failures of firms like American International Group quickly made them a favorite villain in the credit crisis for which some saw central clearing and settlement as an obvious solution.² The liquidity disruptions created by collateral calls on OTC derivatives further fueled policy makers' concerns about the role of centralized clearing and settlement in OTC derivatives.

In June 2009, the Department of the Treasury proposed to revamp substantially the regulatory framework for OTC derivatives, including mandating that many OTC derivatives transactions be cleared and settled through regulated central counterparties.³ After more than a year of hearings, debates, lobbying, and political logrolling, Congress enacted such a requirement in the “Dodd-Frank Wall Street Reform and Consumer Protection Act” (“Dodd-Frank Act” or “Act”) passed on July 15, 2010. President Obama signed the Act on July 21, 2010.

Under the “Wall Street Transparency and Accountability Act” (Title VII of the Dodd-Frank Act), the Commodity Futures Trading Commission (CFTC) and Securities and Exchange Commission (SEC) are vested with extensive new authority to regulate OTC derivatives, including making determinations about what products are subject to mandatory clearing. In addition, swap dealers and major swap market participants will now also be required to execute derivatives transactions on an organized exchange or swap execution platform for all derivatives the regulators designate for mandatory clearing.

This paper evaluates the benefits and costs of OTC-cleared derivatives solutions against the backdrop of derivatives regulation. Section I provides a high-level background on the regulation of derivatives prior to the Dodd-Frank Act. Section II reviews the evolution of OTC-cleared derivatives and some of the most significant clearinghouse providers of OTC clearing solutions. In Section III, the economic benefits and costs of OTC clearing to market participants are reviewed and compared to more traditional bilateral credit risk management techniques. In Section IV, I summarize the key provisions of the Dodd-Frank Act that pertain to OTC derivatives clearing and settlement and discuss some of the challenges and risks to which the new regime may give rise. Section V briefly concludes.

I. Background on Derivatives Regulation

The primary distinction drawn by many between OTC and exchange-traded derivatives concerns the nature of the

marketplace in which the contracts are negotiated. OTC derivatives (*e.g.*, interest rate and credit default swaps) are regarded as contracts negotiated privately outside of a traditional organized exchange, whereas exchange-traded derivatives (*e.g.*, futures and options on futures) are, as their name suggests, listed by and traded on a centralized exchange. This distinction, however, has become increasingly artificial over time as an economic matter and has come to depend heavily on purely regulatory distinctions.

A. Institutional vs. Product Regulation

US financial regulation in the Post-War Era has involved two fundamentally distinct types of regulations: regulations of specific institutions, and regulations on specific products or markets.

Regulatory agencies like the Office of the Comptroller of the Currency (OCC), the Federal Reserve, the Office of Thrift Supervision (OTS), and various state banking and insurance regulators are institutional regulators. Firms subject to institutional regulation are deemed to merit regulation because of their role in the economic system and capital markets – *e.g.*, banks are regulated because customer deposits are federally insured and because they have direct access to payment systems. Institutional supervision and regulation thus encompass the safety and soundness of the entire regulated institution across all of its risk-taking activities.

Both the SEC and CFTC, by contrast, are product-based regulators. The mission of the SEC is “to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.”⁴ To accomplish this, the SEC regulates non-exempt securities and options on securities, securities exchanges, broker/dealers, and other securities market participants. The CFTC, in turn, regulates non-exempt commodities, futures and futures options, futures exchanges, futures commission merchants, and other institutions involved with commodities or futures trading. The CFTC’s mandate is assuring “the economic utility of the futures markets by encouraging their competitiveness and efficiency, protecting market participants against fraud, manipulation, and abusive trading practices, and by ensuring the financial integrity of the clearing process.”⁵

Product-based regulation is sometimes called “functional regulation” because it purports to regulate the economic functions of the capital market rather than the institutions that provide those functions at any given time.⁶ Judge

⁴ <http://www.sec.gov/about/whatwedo.shtml>

⁵ <http://cftc.gov/aboutthecftc/index.htm>

⁶ For two sharply contrasting perspectives on the virtues and vices of functional regulation, see Miller (1994) and Scholes (1995).

² Many of the criticisms that have been leveled at CDSs lack economic justification. For a refutation of such criticisms, see, *e.g.*, Stulz (2010).

³ See Department of the Treasury (2009).

Easterbrook of the Seventh Circuit has commented:

“[O]ne could think of the distinction between the jurisdiction of the SEC and that of the CFTC as the difference between regulating capital formation and regulating hedging.”⁷

B. OTC vs. Exchange-Traded Derivatives

1. Exchanges and Exchange-Traded Derivatives

From an economic perspective, a derivatives exchange is an organization that performs three main functions.⁸ The first is product design. An exchange designs contracts that are listed for trading by authorized trading participants. Most of the terms in a typical exchange-traded derivatives contract (*e.g.*, contract expiration dates, minimum price quotation increments, deliverable grade of the underlying, delivery location and mechanism, etc.) are standardized.

Second, exchanges provide a trading venue (either physical or electronic) for the products they design and list. Direct access to an exchange is generally limited to firms and individuals that the exchange approves as authorized trading participants.⁹ Trading participants, in turn, agree to abide by the rules of the exchange pertaining to financial capitalization, monitoring and surveillance by the exchange, risk management, recordkeeping, market integrity and stability (*e.g.*, anti-manipulation rules), and the like.

Finally, exchanges provide various price reporting services.¹⁰ Transaction prices resulting from the trading process are distributed by the exchange to trading participants, data vendors and subscribers, and (ultimately) the financial press.

Regulators often adopt more specificity than above in their definitions of exchanges and exchange-like entities (especially with the advent in the past decade of numerous quasi-exchange trading venues). In some cases, that additional specificity reduces legal and regulatory uncertainty when compared to more ambiguous regulatory concepts like “boards of trade.” In other cases, more specificity can create additional uncertainty to the extent that the specific definitions are associated with ill-defined or ambiguous regulated products.

Consider, for example, the CFTC’s current system of classifying exchange-like entities. Designated Contract Markets (DCMs) list commodities, futures, and futures options for trading by all types of authorized traders, whereas Designated Transaction Execution Facilities (DTEFs) allow a more restricted group of institutional or otherwise eligible traders access to trade a narrower range of products.

The CFTC also defines two categories of quasi-exchanges that are exempt from CFTC regulation.¹¹ Exempt Boards of Trade (EBOTs) can be exempt from CFTC regulation as long as the products listed for trading have no underlying cash market, an underlying market with inexhaustible deliverable supply, or an underlying market that is sufficiently large and liquid to make market manipulation highly unlikely. GFI Group’s ForexMatch®, for example, is an EBOT that facilitates electronic trading in various OTC currency derivatives.¹² At the time of this writing, there were seven EBOTs recognized by the CFTC. Only two of those EBOTs are cleared by CCPs – CME Alternative Marketplace, Inc., and Swapstream Operating Services Ltd., both of which are cleared by CME Group.¹³

Similarly, Exempt Commercial Markets (ECMs) are electronic trading platforms that facilitate trading of “exempt commodities” (*e.g.*, energy and precious metals) by Eligible Market Participants. ECM designations have been approved by the CFTC for the Chicago Climate Exchange’s carbon emissions allowance market, the Intercontinental Exchange (ICE) markets for precious and base metals and certain energy products, the International Maritime Exchange (IMAREX) freight rate derivatives market, and others.

In addition to its regulation of markets where regulated financial products trade, the CFTC also regulates clearinghouses that clear and settle regulated futures and options. These entities are classified as either Designated Clearing Organizations (DCOs) or Multilateral Clearing Organizations (MCOs).

Notice how heavily these regulatory definitions of certain exchange and exchange-like entities depend on the underlying products the exchange lists for trading. In other words, whether or not a particular trading platform or entity is considered an exchange for regulatory purposes depends largely on whether it lists a regulated product for trading.

⁷ *Chicago Mercantile Exchange v. SEC*, 883 F.2d 537 (7th Cir. 1989), at 543.

⁸ Various definitions of exchanges can be found in the academic literature, and I make no claim that mine is “the right one.” See, *e.g.*, Telser and Higginbotham (1977), Telser (1981), Mulherin, Netter, and Overdahl (1991a), and Pirrong (1995).

⁹ Customers that are not authorized trading participants but wish to transact in exchange-traded derivatives must do so through a designated broker or futures commission merchant.

¹⁰ See Mulherin, Netter, and Overdahl (1991a, 1991b).

¹¹ An organization must apply to the CFTC for such an exemption.

¹² <http://www.gfigroup.com/assets/0/190/192/213/225/f4dcc015-3131-4ca2-9a7a-5a76e4407b62.pdf>.

¹³ <http://services.cftc.gov/SIRT/SIRT.aspx?Topic=TradingOrganizations&implicit=true&type=EBOT&CustomColumnDisplay=TTTTTTTT>.

2. OTC Derivatives

OTC derivatives are bilateral, privately negotiated contracts that derive their value from some underlying commodity or asset price, reference rate, or index. They may be settled in cash or physically and include a wide range of commercial contracts like forward purchase agreements. Indeed, commercial OTC derivatives have been documented going back for centuries.¹⁴

Swaps are widely regarded as the first modern example of OTC financial derivatives. In 1981, for example, the World Bank and IBM executed a swap agreement arranged by Salomon Brothers (Park, 1984; Flavell, 2005). That transaction was typical of other swaps executed in the early 1980s – *viz.*, mostly one-off deals arranged by banks for their corporate finance customers. Soon thereafter, dealers began to intermediate OTC derivatives transactions to reduce counterparty search costs for their customers. Unlike brokers or advisors, dealers were principals in the transactions they arranged.

Nearly all OTC derivatives today are still negotiated between a dealer and end user or between two dealers. Inter-dealer brokers (IDBs) also play an important role in OTC derivatives by helping dealers (and sometimes end users) identify willing counterparties and compare different bids and offers. In addition, various forms of electronic trading systems have also been developed to facilitate the negotiation of OTC derivatives.

The July 2009 Treasury Plan stated that the “the market for OTC derivatives has gone largely unregulated.”¹⁵ Although no federal or state agency has ever been designated as a regulator of OTC derivatives *as a product*, virtually all systemically important financial institutions are regulated – including oversight of their OTC derivatives activities.¹⁶ For example, the Fed’s *Trading and Capital-Markets Activities Manual* for examiners is 675 pages long and includes sections on OTC derivatives like forwards, forward rate agreements, interest rate and currency swaps, credit derivatives, OTC equity derivatives, OTC options, and commodity swaps.¹⁷

Admittedly, the resources available at some regulatory agencies may have been too limited to facilitate their consolidated supervision and regulation of large financial

institutions involved in multiple areas of financial activity. And there are other problems in the current institutional regulatory regime, including overlaps across institutional regulators (within the US and cross-border), definitions of primary consolidated institutional regulators, and the like. Yet, these problems are not caused by OTC derivatives *per se*.

Consider, for example, AIG. When the Office of Thrift Supervision (OTS) approved AIG’s request to form AIG Federal Savings Bank in 2000, the OTS became the consolidated supervisor of the AIG conglomerate. As Acting OTS Director Scott Polakoff explained to the Senate Banking Committee, OTS did not take its supervisory responsibilities lightly:

OTS’s primary point of contact with the [AIG] holding company was through AIG departments that dealt with corporate control functions, such as Enterprise Risk Management (ERM), Internal Audit, Legal/Compliance, Comptroller, and Treasury. OTS held monthly meetings with AIG’s Regulatory and Compliance Group, Internal Audit Director and external auditors. In addition, OTS held quarterly meetings with the Chief Risk Officer, the Treasury Group and senior management, and annually with the board of directors. OTS reviewed and monitored risk concentrations, intra-group transactions, and consolidated capital at AIG, and also directed corrective actions against AIG’s Enterprise Risk Management. OTS also met regularly with Price Waterhouse Coopers (PwC), the company’s independent auditor (Polakoff, 2009, pp. 10-11).

Approximately 85% of AIG (measured by allocated capital), moreover, was regulated by some other regulator *in addition to OTS* (Polakoff, 2009).

C. Regulatory and Legal Uncertainty

The history of US derivatives regulation is characterized by frequent regulatory battles for jurisdiction, legal uncertainties over financial product classifications, and regulatory overlaps (as well as some gaps). Many of the uncertainties that have plagued US derivatives markets have resulted from tensions between institutional and product-based regulations.¹⁸

Ambiguous definitions of financial products and the legal and regulatory uncertainties generated by those ambiguities have been the norm rather than the exception in the history of US derivatives regulation. That is not altogether surprising given that the original frameworks for regulating commodities and securities were put into place in the 1930s.¹⁹ Financial innovations that

¹⁴ See, e.g., De Roover (1948, 1963), Swan (2000), and Culp (2004).

¹⁵ Department of the Treasury (2009), at 47.

¹⁶ Certain end users of derivatives are subject to little or no direct regulation – e.g., non-financial corporations that use OTC derivatives to hedge, or hedge funds that enter into OTC derivatives for position-taking.

¹⁷ See Federal Reserve System (1998) §4000.

¹⁸ See Culp (1995) for a lengthier discussion of this issue.

¹⁹ Commodity and futures market regulations trace primarily to the Commodity Exchange Act of 1936 (as amended). (Prior to the establishment

have occurred since then have posed numerous legal, regulatory, and jurisdictional challenges that have forced frequent revisions and clarifications of regulations.

The 1970s, 80s, and 90s represented a particularly challenging period for derivatives regulation. Those decades were marred by numerous court cases and regulatory disputes over issues related to the enforceability and regulation of various types of derivatives products. The SEC and CFTC, Congress, and the Courts struggled to resolve issues like the following: What is a “commodity?” What is a “futures contract?” What kinds of foreign exchange transactions are excluded from CFTC regulation? What kinds of commercial forward purchase contracts are excluded from CFTC regulation? Are swaps futures, securities, both, or neither? Does the regulatory status of a product depend on the sophistication of the firm or individual using the product and/or the economic purpose of the transaction? If a product has characteristics of both securities and futures, does SEC or CFTC jurisdiction dominate? What are the tests for determining when an OTC derivatives contract has enough “futurity” that it is an “illegal off-exchange futures contract?”²⁰

Both the SEC and CFTC attempted to clarify some of these uncertainties in the 1980s and 90s through a combination of enforcement actions, policy statements, no action letters, and new regulations. Congress also took significant steps to reduce the legal and regulatory uncertainty overhanging OTC derivatives with the adoption of the Futures Trading Practices Act of 1992, the Gramm-Leach-Bliley Act of 1999, and the Commodity Futures Modernization Act (CFMA) of 2000. Indeed, many market participants considered that after years of uncertainty the mixed institutional and product-based framework for US derivatives regulation had finally stabilized – that is, until the July 2010 adoption of the Dodd-Frank Act, as I will discuss in Section IV.

II. Clearing and Settlement for OTC Derivatives

An OTC derivatives contract obliges its counterparties to make certain payments over the life of the contract or following an early termination event.²¹ “Clearing”

of the CFTC in 1974, commodities regulation was undertaken by the Grain Futures Authority and the Commodity Exchange Administration – later renamed the Commodity Exchange Authority.) Securities regulations are based on the Securities Act of 1933 (as amended) and the Securities Exchange Act of 1934 (as amended). See, e.g., Markham (1986).

²⁰ See, e.g., Russo and Vinciguerra (1991), Culp (1991,1995), Gooch and Klein (1993), and Johnson and Hazen (2008).

²¹ On physically settled derivatives, the long (buyer) has an obligation to make a payment, but the short (seller) has an obligation to make a delivery

is the process by which payment obligations between two or more firms are computed (and often netted), and “settlement” is the process by which those obligations are discharged. The means by which payments on OTC derivatives are cleared and settled affect how the credit risk borne by counterparties in the transaction is managed.

Three general approaches to the clearance and settlement of OTC derivatives are discussed below. In all three areas, the clearing and settlement solutions available to OTC derivatives participants have expanded significantly in the past decade.²²

A. Bilateral Clearing and Settlement Infrastructure Providers

In the 1980s and early 1990s, firms managed and controlled their bilateral counterparty exposures primarily through the use of “credit enhancements” that either reduced the likelihood of dealing with a relatively high-risk counterparty or reduced the potential loss exposure if a default did occur. Popular credit enhancements included collateral, periodic marking to market and cash resettlement of positions, and third-party performance guaranties (Global Derivatives Study Group, 1994a,1994b).

Attention by market participants to credit risk management techniques and credit enhancements was heightened between 1989 and 1992 when five companies failed with relatively substantial amounts of outstanding OTC derivatives: Development Finance Corporation of New Zealand (1989), Drexel Burnham Lambert (1990), British & Commonwealth Merchant Bank (1990), Bank of New England (1991), and Olympia and York (1992).

Regulators and legislators were also paying significant attention to OTC derivatives credit risk management around the same time – e.g., specific sections on managing the credit risk of swaps were included, for example, in the Financial Institutions Reform, Recovery, and Improvement Act (FIRREA) of 1989, the 1990 amendments to the US Bankruptcy Code, and the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991. The Bank for International Settlements (BIS), moreover, analyzed swap counterparty credit risk management in its 1989 Angell Report (BIS, 1989), 1990 Lamfalussy Report (BIS, 1990), and 1992 Promisel Report (BIS, 1992). The BIS has continued to

of the underlying asset. Clearing and settlement thus refer to both funds and assets. For expositional simplicity and without loss of generality, however, I will assume we are discussing only cash-settled derivatives in which both parties’ obligations are in funds.

²² Portions of this section and Section III are based on Culp (2009).

focus considerable attention to this issue since then, as well.²³

Two important forms of credit enhancements that began to enjoy widespread use by OTC derivatives participants are bilateral netting and collateral. I describe each below, and then review some of the ways that clearing and settlement agents can make such credit enhancements even more effective and operationally efficient.

1. Bilateral Netting

Most OTC derivatives are negotiated under *pro forma* agreements known as master agreements that specify a set of commonly used definitions and contract terms. Any particular transaction can be customized, but the use of master agreements provides contract language that is generally accepted amongst OTC derivatives participants. The most popular such master agreements are the ISDA Master Agreements.

Among the standard terms of the ISDA Master Agreements is the bilateral netting of periodic cash flows and close-out netting in the event of a counterparty default or early termination event. Bilateral netting significantly reduces counterparty credit exposures by distilling the gross payments due to change hands into smaller net payments, both over the life of a transaction and following a termination.

Bilateral netting, moreover, is not limited to single types of contracts or products. The ISDA Master Agreements also facilitate cross-product bilateral netting. Two counterparties with significant bilateral credit exposures across several products (*e.g.*, interest rate swaps and credit default swaps) thus can bilaterally net their payment obligations across all their asset classes and transactions, provided they are covered by a single master netting agreement.

2. Collateral

OTC derivatives documented under popular master agreements typically include collateral and other credit support provisions. Figure 1 shows the number of collateral agreements in place for OTC derivatives from 1999 through 2009 (based on ISDA's annual margin survey). The number of collateral agreements in place grew by an average of 32% per year over the period.

About 92% of the collateral agreements in use are the credit support documentation for the ISDA Master Agreements. Non-ISDA collateral agreements include bespoke agreements, long-form confirmations with detailed collateral provisions, and regionally specific agreements (*e.g.*, the German Rahmenvertrag) (ISDA, 2010). Most all collateral agreements enable counterparties to articulate specific

collateral requirements. The collateral that a counterparty must post is usually a function of its perceived credit worthiness and the size of the potential credit exposure on the transaction.²⁴ Many contracts also include provisions for additional collateral that is callable following a downgrade, a significant increase in mark-to-market exposure, or both.

Figure 2 summarizes the total values of reported and estimated collateral from 2000 through 2009. Reported and estimated collateral was rising prior to the credit crisis, and rose sharply in 2008 during the height of the crisis. As volatilities declined back toward more normal levels across many markets in 2009, collateral also declined.²⁵

In 2009, ISDA (2010) reports that about 82% of collateral received on OTC derivatives consisted of cash. Government securities accounted for about 10% of collateral received, and the remaining 8% consisted of corporate bonds, equities, letters of credit, and the like.²⁶

3. Clearing and Settlement Infrastructure Providers

A clearing and settlement infrastructure provider is a third-party entity that plays a purely operational role in the clearing and settlement process. Although infrastructure providers offer no form of *direct* protection to OTC derivatives participants to cover default-related losses, they can enhance the efficiency of the credit risk management process and thereby reduce credit, operational, and systemic risk *indirectly* – sometimes significantly.

One of the most instructive examples of a clearing and settlement infrastructure provider was the original clearinghouse of the Chicago Board of Trade (CBOT). The CBOT was formed in 1848 as a voluntary membership organization to promote agricultural commerce in Chicago. When the CBOT imposed formal trading rules and standardized trading contracts in 1865, the first true US futures market was born. And by the late 1870s, the CBOT was beginning to help members address their counterparty credit risk concerns by calculating and enforcing collateral (a.k.a. margin) requirements on behalf of CBOT market participants (Kroszner, 1999).

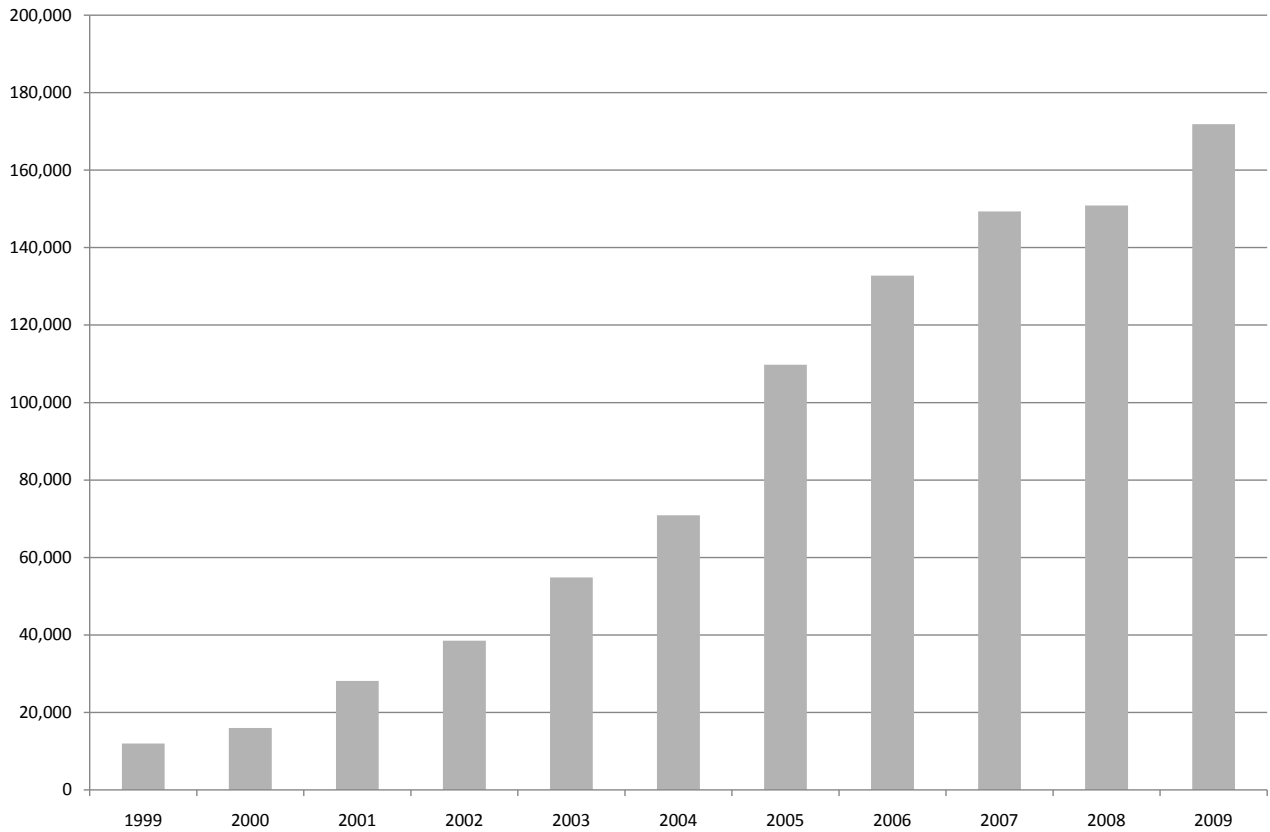
The CBOT's clearinghouse was founded in 1883.

²⁴ In addition to collateral, periodic cash resettlements of OTC derivatives also reduces counterparty credit risk.

²⁵ ISDA (2010) reports that the 2009 decline in circulating collateral was commensurate with the decline in gross credit exposure and counterparty credit risk that occurred at the same time.

²⁶ Collateral requirements are generally adjusted based on the risk of the collateral pledged. For example, a greater amount of equities must be pledged to cover one dollar of exposure than if cash were pledged to cover the same exposure.

²³ See, *e.g.*, BIS (1998) and BIS (2007).

Figure 1: Collateral Agreements in Place for OTC Derivatives

SOURCE: ISDA (2010)

Although no default protections were provided to trading participants, the clearinghouse facilitated offsets of positions and calculated trading members' net margin and payment obligations on a *multilateral* basis. Whereas bilateral netting applies to payments across one or more products between two firms, multilateral netting allows obligations to be netted across multiple trading participants at the same time. According to the *Chicago Tribune*, the CBOT clearinghouse processed 29,986 checks in its first 14 weeks of operation, as compared to the approximately 260,000 checks that would have been exchanged prior to the advent of the clearinghouse netting system (Moser, 1998). So, although the CBOT did not provide direct default protections to trading participants until 1925 when the Board of Trade Clearing Corporation (BOTCC) was established as a central counterparty, its earlier provision of a margining and multilateral netting system still greatly reduced the sizes of counterparty credit exposures.²⁷

More recent examples of clearing and settlement infrastructure providers for OTC derivatives include the following:

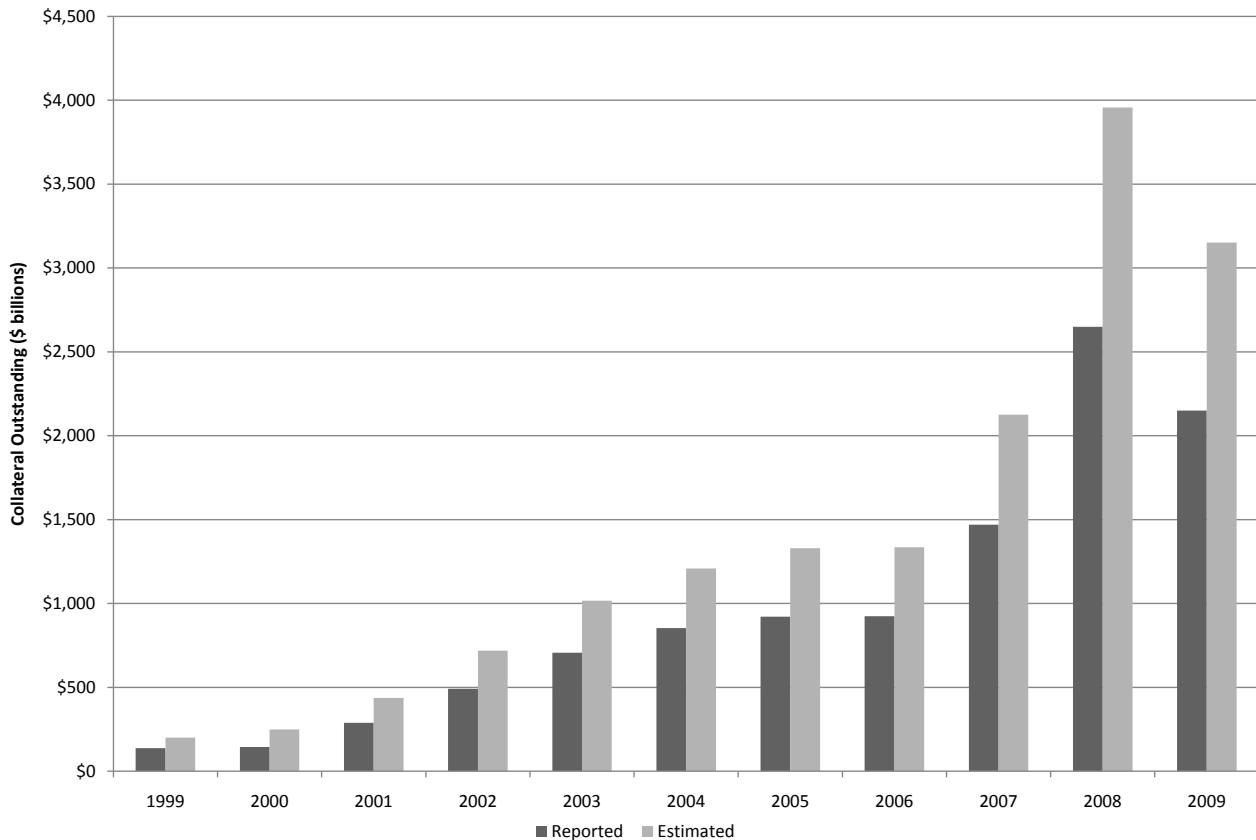
Trade Affirmation, Matching, and Confirmation Services: Significant developments in the past few years have advanced the automation and efficiency of OTC derivatives trade processing and post-trade servicing. For example, the Depository Trust & Clearing Corporation (DTCC) "provides an integrated global payment processing infrastructure for the OTC credit derivatives market...."²⁸ Specifically, DTCC's Deriv/SERV system provides a matching and confirmation service to dealers on the majority of their credit derivatives transactions. Transactions processed through Deriv/SERV are then entered into a Trade Information Warehouse that tracks the details of all resident transactions. Other examples of post-trade processing agents include the Society for Worldwide Interbank Financial Telecommunication (SWIFT) and SWIFTNet for OTC derivatives, Markit Wire, Traiana Harmony, and Creditex's T-Zero.²⁹

Exposure and Collateral Reconciliation Services: A

²⁸<http://www.cls-group.com/Products/Settlement/Pages/ForOTCDerivatives.aspx>

²⁹SWIFT, *Derivatives: Enabling Automation for OTC Derivatives Transactions* (2008).

²⁷ See Williams (1986), Moser (1998), and Kroszner (1999).

Figure 2: Collateral in Circulation for OTC Derivatives

SOURCE: ISDA (2010)

significant challenge facing OTC derivatives participants (especially in recent years) is the calculation of mark-to-market values of open positions for the purpose of collateral calls. Although the calculations themselves may not seem difficult, counterparties must reconcile their exposure estimates with one another and agree on a price for collateral calculations. Several infrastructure providers have developed services to help OTC derivatives participants streamline this process and address potential valuation disputes before a collateral call occurs. TriOptima's triResolve, for example, reports reconciling over 10 million trades across more than 1,400 bilateral relationships (most on a daily basis).³⁰ Similarly, DTCC and Euroclear provide a reconciliation service in which positions from DTCC's Trade Information Warehouse are re-priced with valuation services from Euroclear Bank.

Collateral Management: Euroclear Bank's DerivManager provides various trade and portfolio analysis tools for OTC derivatives, including trade recognition and matching, bilateral exposure reconciliations, and matched-exposure

netting. DerivManager can perform these services on portfolios of partially unmatched trades with multiple counterparties or on trades already matched by another provider (e.g., DTCC's Deriv/SERV and Trade Information Warehouse). Beyond post-trade processing and servicing, users of DerivManager can also take advantage of Euroclear Bank's collateral management and settlement services.

Portfolio Compression Services: The BIS recommended in 2007 that "market participants should routinely identify trades that can be voluntarily terminated, so as to reduce to the extent possible the positions that would need to be replaced following a default (BIS, 2007)." Voluntary early terminations and "tear-ups" can also help OTC derivatives participants reduce operational risks and regulatory capital requirements. TriOptima's triReduce, for example, has terminated in excess of 2.2 million OTC derivatives transactions with a total notional amount of around \$63 trillion since its 2003 launch.³¹ Similarly, Markit and Creditex began providing a portfolio compression service for credit derivatives in August 2008. Since its

³⁰ <http://www.trioptima.com/o.o.i.s/14>.³¹ Yallop (2008)

inception, the Markit/Creditex compression program has reduced over \$1 trillion in notional CDS amounts.³²

the failures of Drexel Burnham Lambert (“Drexel”) in 1990, BCCI in 1991, and Barings in 1995.³⁴

B. Delivery Versus Payment Agents

A delivery-versus-payment (DVP) Agent ensures that a payment made by one party is not passed on to its counterparty until that counterparty has made its own corresponding required payment in turn.³³ If one counterparty fails to make good on its obligation, the DVP Agent returns the non-defaulting counterparty its funds payment. Because DVP Agents do not themselves honor payment obligations in the event of a default, they bear little or no credit risk. Nevertheless, DVP Agents can significantly reduce settlement risk (BIS, 1989, 1993). DVP Agents are most commonly associated with securities settlements. Nevertheless, certain OTC derivatives transactions – especially currency derivatives – also benefit from DVP Agent services.

1. DVP Agents and Settlement Risk

Settlement risk is the risk that a counterparty defaults during the settlement period in which the obligations of a contract are being irrevocably and finally discharged. Settlement risk is sometimes called “Herstatt risk” in reference to the failure of Bankhaus Herstatt.

Bank Herstatt was ordered into liquidation at the end of the German banking day on June 26, 1974. The bank’s closure, however, occurred *after* daily payments had been processed by the Bundesbank at 3:30 P.M. Frankfurt time. Before the closure of Herstatt was announced, several New York banks with obligations to and from Herstatt on maturing currency spot and forward transactions had already submitted irrevocable instructions to transfer Deutsche marks to Herstatt in Germany in anticipation of receiving dollars from Herstatt at the close of the banking day in New York. But thanks to the time zone difference, when Bank Herstatt suspended all dollar payments at its New York branch – at 10:30 A.M. New York time – the US payment system had not yet moved funds for the day. So, the New York banks lost the full value of their Deutsche mark payments and never received the corresponding dollar inflows. (BIS, 1996; Galati, 2002)

Herstatt’s failure was the first of several such failures that put strains on payment systems. Similar settlement problems and concerns occurred during

2. CLS Bank

CLS Bank was established in the late 1990s (and went live in September 2002) as a mechanism for helping large banks manage settlement risk in foreign exchange transactions (Galati, 2002). Since then, CLS Bank’s role has expanded significantly, and CLS is now a DVP agent with an active presence in OTC derivatives clearing and settlement. Most recently, CLS Bank acts as a DVP agent for CDS transactions processed through DTCC’s Deriv/SERV platform. For CDSs, the DTCC Trade Information Warehouse computes bilateral net payment obligations across members and submits those payment amounts to CLS Bank for settlement. Participants then process multilaterally netted payment instructions through the CLS Bank, which acts as a DVP Agent for the multilaterally netted cash flows.

The Lehman Brothers failure demonstrated the risk-reducing effects of netting through a DVP Agent. Despite widespread media speculation about the size of the payouts to be exchanged on the then-estimated \$350-\$400 billion notional amounts of Lehman CDSs, the actual aggregate net payment amount was only a fraction of that size. Of the total estimated Lehman CDS exposure outstanding, \$72 billion (notional) was registered in the DTCC Trade Information Warehouse. On October 21, 2008, CLS Bank processed \$5.2 billion in net settlements corresponding to that \$72 billion notional amount (DTCC, 2008).

During the week of September 15, 2008, when Lehman failed, moreover, CLS Bank settled approximately 4.4 million foreign exchange transactions with a gross notional value of \$26.9 trillion (Engert and Lai, 2009). On September 17, 2008, alone, CLS Bank processed a record of more than 1.5 million payment instructions with a gross value of over \$8 trillion. CLS Bank CEO Close commented: “A small percentage of trades were rescinded and that largely depended on what individual arrangements institutions had with their ISDA agreements. The vast majority of Lehman trades were processed smoothly and some of these were for very large amounts....CLS worked exactly as it should do. It took settlement risk out of the market (Oliver, 2008).”

Although DVP Agents like CLS Bank eliminate settlement risk, OTC derivatives participants whose transactions are cleared and settled through a DVP Agent still bear “replacement cost risk.” Replacement cost risk is the risk that a counterparty defaults when the contract is an economic asset to the non-defaulting party – *i.e.*, the defaulted contract

³² <http://www.creditex.com/portfolio-compression.html>

³³ Exchanges of funds for funds occur through payment-versus-payment (PVP) agents. I refer to PVP and DVP Agents interchangeably for simplicity.

³⁴ See BIS (1996).

can only be replaced at a net cost to the non-defaulting party.³⁵

C. Central Counterparties

Virtually all exchange-traded derivatives today are cleared and settled through a central counterparty (CCP) – *i.e.*, a clearinghouse that interposes itself as the counterparty of record for all transactions. In so doing, the CCP protects trading participants from *both* settlement risk *and* replacement cost losses arising from a counterparty default.

Because trading participants whose transactions are cleared and settled by a CCP are essentially exchanging the credit risk of their original counterparties for the credit risk of the CCP, the CCP must maintain financial resources and risk management policies and procedures sufficient to preserve confidence of trading counterparties in the CCP. In addition, most CCPs are shareholder-owned entities whose equity investors also seek to avoid catastrophic losses. As such, derivatives CCPs have some of the most conservative risk management practices of any participants in the market.

Derivatives CCPs typically rely on a multi-tiered system of risk controls, policies, and procedures designed to manage the credit exposure of the CCP (and its participating members) at a reasonable cost. The system is time-tested and has withstood the failures of major firms (*e.g.*, Drexel, Barings, Refco, Lehman, etc.) and major market disruption events (*e.g.*, the stock market crashes of 1987 and 1989, the European currency crisis of 1992, the Asian currency crisis of 1998, and the 2007-2008 credit crisis). The primary risk management tools on which typical derivatives CCPs rely are discussed below.

1. Clearing-Member-Centric Structure

Only “clearing members” have a direct credit relationship to the CCP. All customer transactions or trades by non-clearing-member trading participants must be guaranteed by a clearing member, and that clearing member is liable to the CCP for any outstanding payment obligations that its customers cannot satisfy. Clearing members, in turn, are subject to CCP membership requirements, ongoing credit surveillance and monitoring, capital adequacy requirements, and other risk management protocols. In this manner, the CCP ensures that the only firms to which it has direct credit exposure are those firms over which it has direct oversight and monitoring capabilities.

2. Margin Requirements

Virtually all CCPs require initial margin to be posted as a performance bond for any newly established positions, and all open positions must satisfy minimum margin requirements on an ongoing basis. Non-clearing-member customers must post margin with their clearing members, as well, and clearing members in turn are required to post margin with the CCP for both their customer and house accounts.

3. Mark-to-Market Resettlements

Once or twice each day, all open positions of clearing members (both customer and proprietary) are marked to current market prices by the CCP. Losses on any accounts must be settled with the CCP in cash. In this manner, the CCP ensures that its exposure to the risk of a clearing member default is generally limited to the time between mark-to-market intervals or the time it takes to close out the positions of a defaulting clearing member.

As discussed earlier, most OTC derivatives are characterized by cross-product bilateral netting. Because a CCP is the counterparty to all trades, CCPs typically rely on multilateral netting – *i.e.*, netting across both multiple products *and* multiple firms. In practice, the efficiencies of multilateral netting can vary widely across clearinghouses depending on whether the CCP administers a “net” or “gross” margining system and the degree of cross-product margining and variation payment netting permitted.

4. Default Resolution Protocols

If the financial resources of a clearing member are inadequate to cover any unsettled obligations to the CCP (arising from customer defaults and/or losses in the clearing member’s house account), the clearing member may be declared in default by the CCP. If the default arises from a clearing member’s house account, the clearing member’s customer accounts are transferred to other non-defaulting clearing members. As the failures of firms like Drexel, Barings, Refco, Lehman, and others have demonstrated over time, the ease with which customer accounts can be transferred to non-defaulting clearing members helps preserve confidence and market integrity in times of duress or crisis.³⁶

³⁵ Even if the non-defaulting firm does not actually need to replace the defaulted contract, it has still lost an asset and incurs an economic mark-to-market loss.

³⁶ CFTC funds segregation regulations are also viewed by many as helping greatly to facilitate the ease with which customer accounts can be transferred from a defaulting clearing member to a non-defaulting member.

Table I: Financial Resources Backing CME Clearing

Resource	Amount as of September 30, 2009 (\$ millions)
Aggregate Margin Deposits	\$85,788
Market Value of CME Pledged Shares/Trading Rights	\$647
CME Surplus Funds	\$100
Clearing Guarantee Fund	\$1,973
Assessment Rights	\$5,426
<i>Total</i>	<i>\$93,934</i>

Source: CME Group (2010)

5. Risk Capital and Financial Safeguards

Following a clearing member default, the CCP assumes any net unsettled obligations and open positions from the defaulting clearing member. Most CCPs then attempt to hedge or liquidate those positions in a timely and non-destabilizing manner. Losses incurred by a typical CCP in the liquidation of a defaulting clearing member's positions are financed first by resources pledged by the defaulting clearing member, and only later are mutualized and shared by other clearing members. Although all CCPs have their own particular "risk capital structures," a specific example will help illustrate. To that end, the financial resources underlying the risk capital structure of CME Group, Inc., are summarized in Table I.³⁷

As noted, the first line of defense against default-related losses is the margin on deposit from the defaulting clearing member. Total margin on deposit at CME Clearing on September 30, 2009, was \$85.788 billion. Should a defaulting clearing member's losses exceed its margin on deposit, the next resource available to CME is the value of that member's pledged CME shares and trading rights. In September 2009, aggregated pledged shares and trading rights totaled \$647 million.

CME Clearing also requires all clearing members to pay into a Clearing Guarantee Fund, which totaled \$1.973 billion on September 30, 2009. Following a clearing member default that exceeds that member's margin on deposit, the defaulting clearing member's deposit in the Clearing Guarantee Fund may also be applied by the clearinghouse to any uncovered losses. At that point, the resources of the defaulted clearing member available to the clearinghouse are in principle exhausted, and CME Clearing must turn toward other parts of its financial safeguards package. The first source

of funds to be applied to default-related losses after the defaulting clearing member's funds are gone is up to \$100 million in surplus funds (*i.e.*, retained earnings) of CME Group itself – *i.e.*, CME shareholders' funds. If uncovered losses still remain, CME Clearing then taps the Clearing Guarantee Fund more generally. This is the first stage at which losses arising from a clearing member's default are borne by other clearing members of CME. And historically, no clearing member default has ever been so large as to precipitate a draw-down of the Guarantee Fund.

Finally, CME Clearing has a contingent assessment power to raise up to \$5.426 billion in additional funds from non-defaulting clearing members. To help bridge any temporary liquidity shortfalls that might arise in the default resolution process, moreover, CME Clearing also maintains a fully secured, committed line of credit with a bank syndicate in the amount of \$600 million (expandable up to \$1 billion).

Other CCPs have slightly different features of their risk capital structures. Some CCPs, for example, have relied in the past on financial guaranties provided by (re-)insurance companies as sources of "soft capital."³⁸ Not all CCPs, moreover, have post-loss assessment rights on clearing members.

Another question in the design of CCP risk capital structures concerns the nature of the "coverage" provided by clearing guarantee funds. At some derivatives clearinghouse organizations, a single default fund is set up to cover default-

³⁷ The financial safeguards of CME Group shown are as of September 30, 2009. These resources do not reflect the changes (and additional funds) that have been implemented to support CME's CDS clearing initiative.

³⁸ Over \$1 billion in clearinghouse guaranties were provided through 2006 to support derivatives and securities clearinghouses. Many of the insurance company providers of these facilities, however, experienced significant losses during the credit crisis and have withdrawn from the underwriting of these coverage lines as a result of their own difficulties. Nevertheless, there is some evidence that banks and securitization agents may be stepping in to fill the remaining demand for synthetic risk capital.

Table II: Current and Planned Clearing Solutions for OTC Derivatives

Clearinghouse	Jurisdiction	Interest Rate Swaps	Credit Default Swaps	Foreign Exchange	Equity Derivatives	Energy Derivatives	Other Commodity
CME Clearing Europe	UK	●	●	●		●	
CME Group	US	●	■	●		■	■
Eurex Clearing	Germany		■		■		
European Commodity Clearing	Germany					■	
ICE Clear Europe	UK		■			■	■
ICE Trust US	US		■				
Int'l Derivatives Clearing Group	US	■					
Kansas City Board of Trade	US						■
LCH.Clearnet Ltd.	UK	■		●		■	■
LCH.Clearnet SA	France		■				
Nasdaq OMX Stockholm	Sweden					■	
New York Portfolio Clearing	US	●					
NYSE Liffe ^a	UK				■		■
Options Clearing Corp.	US				●		
Singapore Exchange	Singapore	●		●		■	■
Tokyo Financial Exchange	Japan	●	●				
Tokyo Stock Exchange	Japan	●	●				

● = Proposed/In Development ■ = Live/In Production

^a: NYSE Liffe's parent NYSE Euronext plans a transition from LCH.Clearnet by the end of 2012.

Source: Morrison (2010); Futures Industry Association

related losses arising from *any* clearing member default in *any* product category.³⁹ At other clearinghouses, separate default funds are used to cover clearing in different product categories. For example, Eurex Clearing maintains a single clearing fund to cover default-related losses arising from any clearing member default across all cleared products, both exchange-traded and OTC-cleared.⁴⁰ ICE, by contrast, maintains a separate clearing fund for CDSs cleared in the US through ICE Trust and in Europe through ICE Clear Europe (ICE, 2010).

D. Recent Experiences with OTC Derivatives Cleared Through CCPs

Clearing and settling OTC derivatives through CCPs was already becoming popular well before the advent of the financial crisis in mid-2007. In the late 1990s, for example, OM Group in Stockholm was providing CCP services for OTC interest rate derivatives transactions (both plain vanilla and customized) (BIS, 1998). Table II summarizes the major existing solutions for OTC derivatives clearing, as well as the new initiatives that are in the planning or development stage. Some of the most significant existing CCPs for OTC-cleared derivatives are discussed below.⁴¹

1. LCH.Clearnet

One of the earliest entrants into OTC derivatives clearing was London Clearing House (LCH), now called LCH.Clearnet. In 1999, LCH established two OTC clearing CCPs – RepoClear and SwapClear – to clear and settle repurchase agreements and plain vanilla interest rate swaps, respectively. In 2008, RepoClear cleared an average of €479,795 billion in term fixed-income instruments and SwapClear was the CCP for \$215.5 trillion (notional) in interest rate swaps across 14 currencies (*i.e.*, an estimated one-third of the global interest rate swap market). Although SwapClear has to date been available as a CCP only to a relatively small group of about two dozen banks, LCH.Clearnet announced in 2009 that they would make its CCP facility available

³⁹ Even if contribution requirements to a clearing default fund are based on clearing members' product portfolios (as is often the case), the allocation of such funds to cover losses need not be product-based.

⁴⁰ http://www.eurexclearing.com/risk/lines_defense/funds_en.html.

⁴¹ A number of other CCPs also either already have a presence in the OTC-cleared derivatives space or are planning to enter the business shortly, as shown on Table II. For a good overview of OTC clearing and some of these other ventures, see Acworth and Morrison (2009).

to a broader group of client firms (LCH.Clearnet, 2010).

The failure of Lehman Brothers was an important test for LCH.Clearnet's SwapClear. When Lehman failed on September 15, 2008, it had a total notional amount of \$9 trillion (comprised of 66,390 trades across five major currencies) in SwapClear. LCH.Clearnet (with assistance from outside professional traders) immediately began to hedge the market risk of Lehman's defaulted portfolio. From September 24, 2008, to October 3, 2008, SwapClear managed a competitive auction process for the assumption of the defaulted Lehman swaps. The auctions were completed successfully, and the margin that had been collected by LCH.Clearnet from Lehman was sufficient to ensure that neither the CCP nor its clearing members incurred any default-related losses (LCH.Clearnet, 2008).

2. CME ClearPort

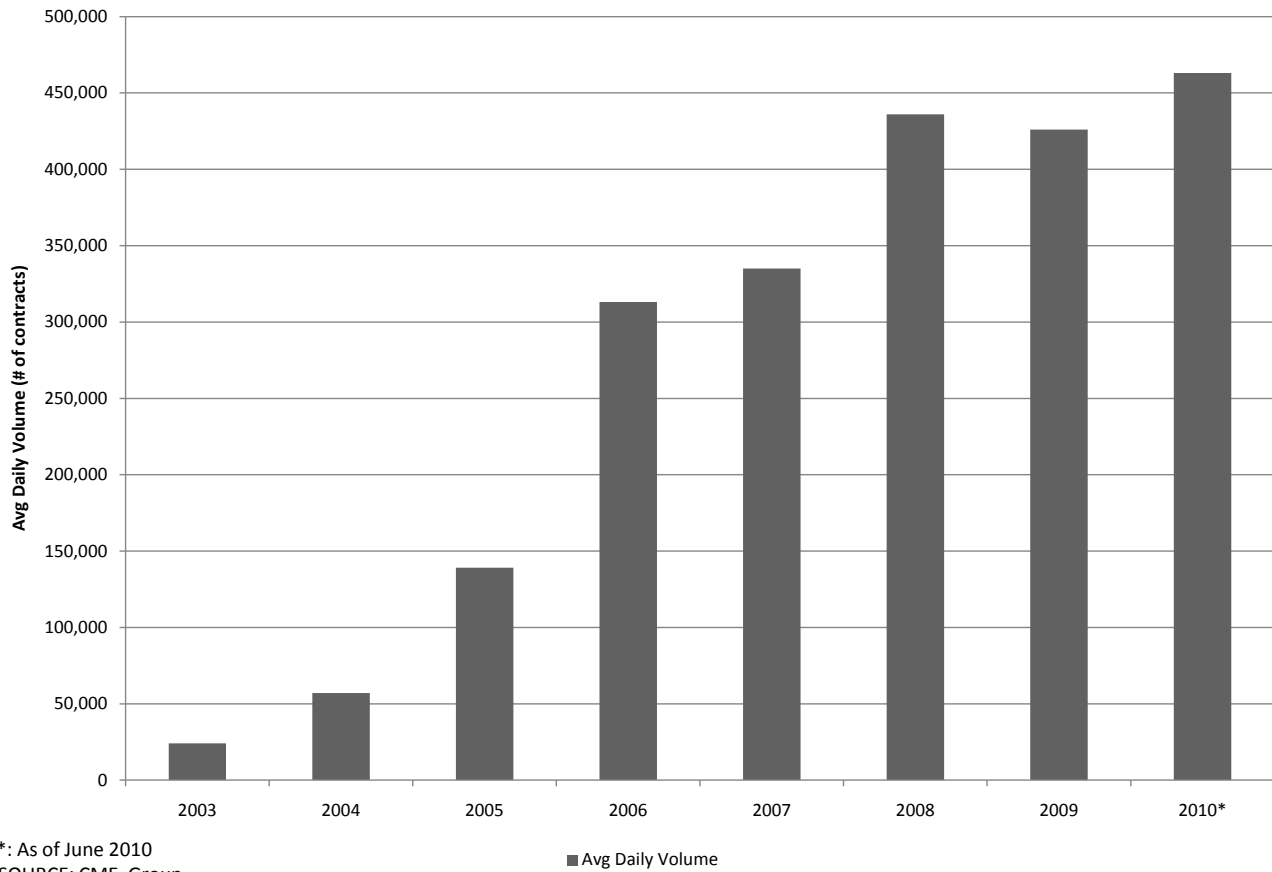
Following the failure of Enron (and EnronOnline), the demand for CCP clearing of energy derivatives grew significantly amongst market participants. In response to that surge in demand, the New York Mercantile Exchange (NYMEX) established ClearPort as a CCP for OTC energy derivatives. NYMEX and ClearPort were acquired by CME Group in 2008. In 2009 (the first full year in which ClearPort was part of CME Group), ClearPort is estimated to have accounted for about 9% of CME Group's total annual revenue (Acworth and Morrison, 2009).

As shown in Figure 3, ClearPort has experienced explosive growth over time. Average daily volume has grown from just over 24,000 contracts in 2003 to 583,000 in early 2009. The number of contracts offered for OTC clearing through ClearPort has also expanded significantly from 67 contracts in 2003 to about 650 products in early 2009 (Acworth and Morrison, 2009). These products still include energy products, as well as some non-energy commodities and CDSs. Most of the CME's OTC-cleared products are converted into equivalent futures contracts when rebooked into the CME clearinghouse.⁴²

3. ICE OTC Clearing

Like NYMEX with its ClearPort facility, ICE responded to the heightened demand for OTC clearing in the energy derivatives market by offering OTC-cleared energy derivatives solutions beginning in 2002. Today, ICE offers about 300 energy products for OTC clearing, including products based on crude oil, natural gas, natural gas liquids, and power.

⁴² There are some exceptions, such as the grain swaps that can be booked into the CME Clearinghouse through ClearPort.

Figure 3: CME ClearPort Average Daily Volume

In addition to energy products, ICE now also offers OTC clearing for certain CDSs. Figure 4 shows the significant and rapid growth in ICE's OTC-cleared derivatives since 2002.

OTC derivatives that are cleared by ICE as a CCP remain OTC derivatives once booked into the clearinghouse. As such, they are not fungible and cannot be offset with exchange-traded derivatives at ICE Futures. OTC-cleared derivatives are, however, eligible for portfolio margining with exchange-traded instruments.

4. Eurex

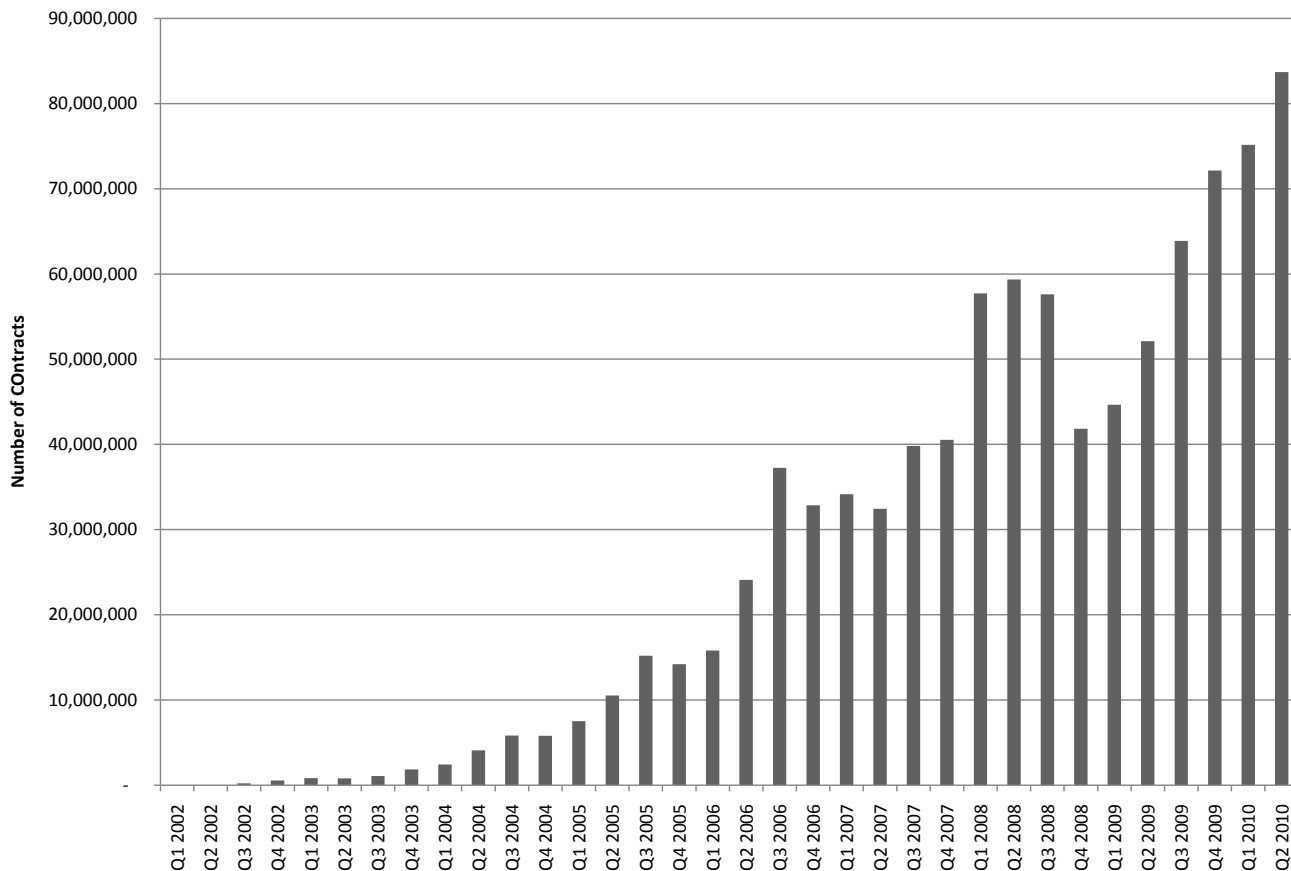
Nearly half the total volume of Eurex consists of OTC-cleared derivatives. (Acworth and Morrison, 2009) Figure 5 shows the number and types of OTC derivatives cleared by Eurex since early 2005. Most of the OTC products cleared through Eurex are equity and equity index futures and options and futures and options on European government bonds.

In addition to offering both bilateral and multilateral OTC trade registration services in which OTC derivatives can

rebooked into the Eurex clearinghouse, Eurex also offers a variety of clearing solutions for products that are related to Eurex's listed futures and options. For example, listed products can be negotiated off-exchange through block trades and registered with the clearinghouse. Eurex also offers traders the ability to customize certain standardized exchange-traded futures and options – *viz.*, futures may be customized by maturity and settlement mechanism, and traders can customize option maturities, strike prices, exercise styles, and settlement methods (Eurex Clearing, 2008).

In July 2009, Eurex also launched Eurex Credit Clear to provide CCP clearance and settlement for both single-name and index CDSs. Eurex Credit Clear works in conjunction with the DTCC Trade Information Warehouse and settlement through CLS Bank (as discussed in Section II-A-3). In other words, after an OTC CDS trade is confirmed, it is submitted to the DTCC Trade Information Warehouse, where the trade is then tracked through its life cycle. Periodic and default-related cash flows are processed through CLS Bank, where Eurex Clearing's payment bank is a participant. In the event of a counterparty default, Eurex Clearing acts

Figure 4: Total Volume of OTC-Cleared Derivatives at ICE



SOURCE: ICE

as trade guarantor. Like other CCPs, Eurex Credit Clear enforces margin requirements on its CDS clearing members along with other prudential risk management requirements (Eurex Clearing, 2010). To date, however, volume in Eurex Credit Clear has been virtually non-existent.

III. Benefits and Costs of OTC Derivatives Clearance and Settlement Through CCPs

Although CCP clearing and settlement of OTC derivatives has become more prevalent, OTC clearing has been more popular with some products and firms than with others. Indeed, the fact that not all OTC derivatives have flooded into a CCP is a strong indication that there are both costs and benefits of OTC clearing. Some of those benefits and costs are reviewed below.

A. Benefits of OTC Clearing Through a CCP

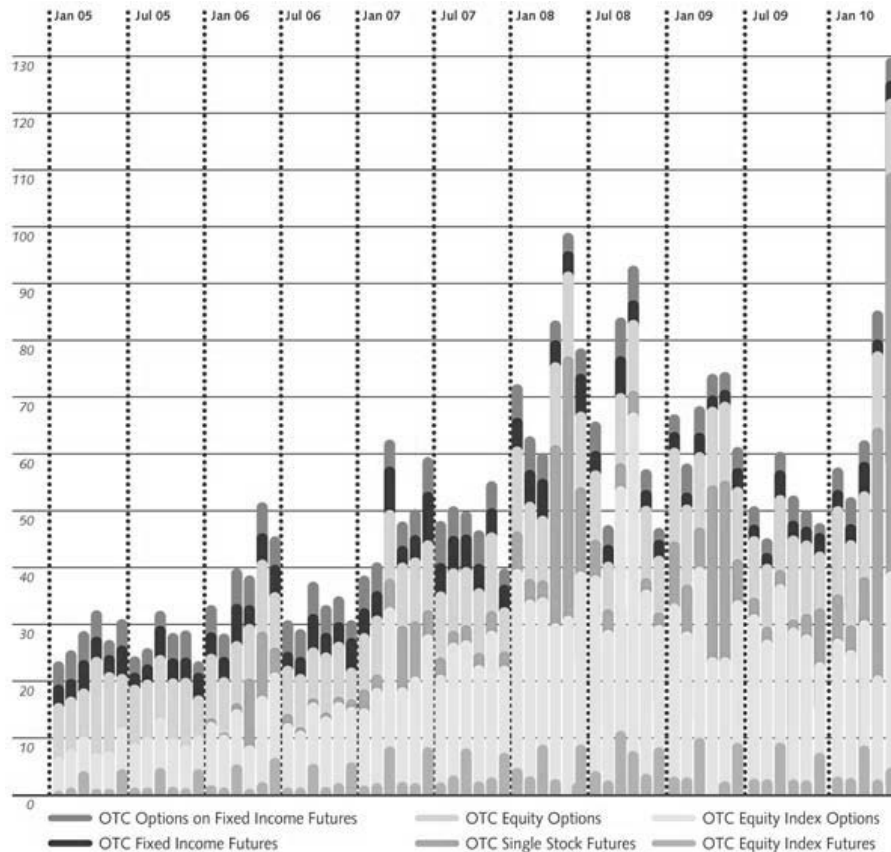
1. Reduced Counterparty Credit Evaluations and Ongoing Credit Exposure Monitoring

By interposing a single counterparty between all buyers and sellers, a CCP facilitates “counterparty anonymity” and reduces the need for credit evaluations of numerous different trading counterparties on an ongoing basis. That separation of price and credit risks has long been recognized as a significant benefit of organized futures exchanges and CCPs (Telser, 1981b).

2. Transparency and Consistency of Pricing for Margin and Funds Settlements

OTC-cleared derivatives are subject to margin requirements and cash settlements that are based on mark-to-market prices determined by the CCP. The

Figure 5. Eurex Clearing OTC-Cleared Derivatives



SOURCE: Eurex Clearing

prices used by the CCP for calculating clearing balances and payment obligations, moreover, are applied in a consistent manner across firms – *i.e.*, the same contract price is applied to all like positions and accounts. CCPs establish standard procedures for marking contract prices to market and reduce operational risks by establishing efficient mechanisms for monitoring and ensuring compliance with margin requirements. The aggregation of pricing information in the clearing house also enhances financial safeguards by reducing disputes about collateral valuation. Similarly, clearing house standardization of OTC-cleared contracts facilitates the establishment of collateral requirements by reducing the scope of idiosyncratic contract terms.

In bilateral OTC markets, by contrast, collateral requirements are based on mark-to-market prices that sometimes differ significantly across market participants. In the event of a dispute between counterparties, the “calculation agent” in

the OTC derivatives contract usually gets to determine the price used for determining collateral and settlement values.⁴³

Given the non-transparent and decentralized nature of the OTC market, significant disagreements can occur about collateral requirements, often arising from disputes over the prices used to calculate current mark-to-market values. The lack of transparency in CDS pricing, through 2007 was lamented by many market participants.⁴⁴

During 2007 and 2008, a lack of pricing transparency and market liquidity contributed to disputes among CDS market participants about the valuation of CDS positions for the purpose of enforcing or disputing collateral calls. Such disputes were in some cases highly disruptive and led to significant unexpected liquidity shocks.

⁴³ See, *e.g.*, BIS (2007).

⁴⁴ See, *e.g.*, Credit Suisse (2008).

As discussed in Section II-A, several clearing and settlement infrastructure providers have begun to provide exposure and collateral reconciliation services for OTC derivatives portfolios. Those services provide competition to CCPs for realizing this particular benefit of centralized clearing and settlement.

3. Monitoring of Multilateral Exposures and Correlation Risks

CCP clearing facilitates the monitoring of market participants' aggregate activity within the CCP across products, thereby enabling the clearinghouse to evaluate more effectively the risks faced by individual market participants. In other words, the CCP can function in part as a "delegated risk manager" for its clearing member participants (Culp and Neves, 1997).

This delegated monitoring capability is, of course, limited to the positions cleared through the CCP and does not take into account non-derivatives positions. As such, CCP risk monitoring is not a substitute for internal or outsourced enterprise-wide risk monitoring.

4. Default Resolution

Because OTC-cleared derivatives are negotiated with a CCP, the transactions can be more easily offset or unwound following a clearing member default. As explained in Section II-C, the CCP inherits the remaining open positions of any defaulting clearing member and then typically proceeds to liquidate or hedge them as quickly as possible in a non-destabilizing manner. For OTC-cleared derivatives that are converted into futures inside the CCP, the offset, liquidation, or hedging of those positions is relatively straightforward (as long as the market itself is reasonably stable).

OTC-cleared derivatives that remain OTC contracts subject to master agreements once inside the CCP, however, are non-fungible and cannot be offset against exchange-traded positions.⁴⁵ Indeed, OTC derivatives documented under the standard terms of an ISDA Master Agreement can only be unwound or assigned/novated to another party with the permission of the original trading counterparty.⁴⁶ These restrictions on default resolution in the underlying

contractual documentation can pose challenges for CCPs in resolving the positions of defaulted clearing members.

Yet, CCPs are likely to have more success resolving the open positions of defaulted clearing members than the original trading counterparties would have. When a counterparty is experiencing financial distress and *needs* to get out of a swap or make an unanticipated early termination payment, the non-defaulting party usually has "bilateral monopoly bargaining power" that it can exert to the detriment of the defaulting firm.

Although this issue has received considerable attention in the wake of the credit crisis, the issue itself is hardly new. When Drexel Burnham Lambert Group, Inc. (DBL Group) filed for Chapter 11 status on February 13, 1990, several of DBL Group's subsidiaries with active OTC derivatives portfolios did *not* file for bankruptcy. One such subsidiary – DBL Trading Corp. – had a portfolio of about \$50 billion in foreign exchange and commodity derivatives at the time. Not surprisingly, the decision was made to try and liquidate the portfolio as rapidly as possible. Although a large portion of the portfolio had been closed out by the end of February 1990, not all of DBL Trading's counterparties were cooperative and some attempted to extract above-market spreads and prices for early termination payments (Culp and Kavanagh, 1994).

Similarly, the failure of the Bank of New England N.A. (BNE) on January 6, 1991, was widely anticipated in the market, and BNE's traders had spent nearly a year trying to reduce the bank's \$36 billion (notional) OTC derivatives portfolio before the actual bank closure. Traders reported numerous counterparties trying to extract "nuisance fees" from BNE, which reportedly led to millions of dollars of losses for the bank.

When Development Finance Corporation of New Zealand (DFC) failed in 1989, by contrast, the derivatives portfolio was resolved in a manner that managed to avoid problems resulting from bilateral monopoly bargaining power. DFC (with the approval of the Reserve Bank of New Zealand) engaged JPMorgan as an advisor which sent then-ISDA Chairman Mark Brickell of Morgan's Derivatives Strategy group to New Zealand to shepherd counterparty negotiations during the resolution of the portfolio. Although DFC was itself defunct, counterparties were concerned about preserving their reputations with JPMorgan (at that time one of the largest swap dealers) and the New Zealand government. As a result, the portfolio was resolved with minimal problems.⁴⁷

CCPs that inherit the open OTC positions of defaulting clearing members will be in a situation much more similar to DFC than to Drexel or BNE. Assuming the counterparties wish to continue doing business with the CCP, it will likely

⁴⁵ OTC derivatives can be *hedged*, but unless the hedge is executed with the same counterparty as the original transaction the hedge simply creates a second credit exposure for the firm.

⁴⁶ Standard master agreements do provide for some events that allow (or force) early terminations of derivatives, but in the absence of one of these events or an event of default the counterparties are stuck with each other unless they both agree to end the contract early.

⁴⁷ Indeed, only one counterparty – Security Pacific – was uncooperative during the DFC resolution. *See* Culp and Kavanagh (1994). Some reports suggest, moreover, that DFC eventually recovered what Security Pacific owed following Security Pacific's acquisition by Bank of America.

experience fewer problems in unwinding OTC-cleared swaps at fair prices or assigning/novating them to non-defaulting clearing members. The experience of LCH. Clearnet's SwapClear provides support for this notion. Indeed, some CCPs may choose to require that clearing members utilizing OTC-clearing features of the CCP *pre-agree* to participate in any assignments or auctions of swap portfolios from defaulting clearing members.

Nevertheless, especially for illiquid products or derivatives in markets experiencing ongoing disruptions, CCPs may find it time-consuming and difficult to hedge open positions, and that could be the source of potentially significant losses until the portfolio is ultimately resolved.⁴⁸

5. Default Risk Mutualization and Loss Allocation

If a derivatives dealer or large end user incurs losses on an OTC derivatives contract in excess of any collateral posted, the remaining financial resources of the firm are all that remain to cover the open payment obligation. In other words, dealers backstop their obligations with their own capital. If the swap participant incurs correlated losses that erode its capital base rapidly, the firm itself could default.

Losses in excess of margin at a defaulting CCP clearing member are absorbed by the risk capital structure of the CCP. As noted earlier, this may include some of the CCP's own financial resources, external risk capital (*e.g.*, clearinghouse guaranties), and a mutualized risk capital layer in which other clearing members cover losses arising from defaulted clearing members.

Clearing default funds financed by clearing members are economically equivalent to "industry mutuals" in the traditional insurance arena (Culp, 2006). In such mutuals, all participants make initial contributions. A large loss by any individual member in excess of its margin (*i.e.*, deductible) is then covered by payments from the mutual. As long as risk exposures are imperfectly correlated across clearing members and positions, a smaller amount of *total* risk capital must be collected from individual members to achieve a given desired level of risk coverage *vis-à-vis* a situation when all members had to provide their own risk capital to cover each of those potential losses in isolation.⁴⁹

⁴⁸ See, *e.g.*, BIS (2007).

⁴⁹ The cost to clearing members of the mutualized risk capital backstopping losses in excess of margin at a CCP thus is the sum of (i) the cost of any external risk capital (*e.g.*, clearinghouse guaranties) plus (ii) the weighted cost of capital for clearing members contributing to the default fund. Whether or not that cost exceeds the cost of capital for a firm backing a bilateral OTC derivatives contract is an empirical question.

B. Barriers to OTC Clearing Through a CCP

CCP clearing for derivatives may not always be the most desirable form of credit risk management either from a public policy perspective or for specific market participants. Below are some of the reasons why.

1. Limited Gains for Some Swap Participants from CCP Credit Exposure Monitoring

The anonymity benefit of CCP-cleared futures trading is usually largest for individual traders or firms transacting with multiple unknown trading partners, as on the floor of an exchange. For large financial institutions active in OTC derivatives, however, the counterparty anonymity benefit of CCP clearing for OTC derivatives will be considerably smaller. Such institutions generally already have ongoing relationships, credit lines, and active credit exposure monitoring for their OTC counterparties (many of which may also be corporate borrowers from swap dealer banks). As such, the *marginal* cost of ongoing bilateral credit exposure monitoring that a CCP would help such firms avoid could be relatively small. On the contrary, ceding credit risk management to a CCP might even deprive such firms of important economies of scope – *viz.*, banks will have to continue to engage in credit risk monitoring of many of their OTC derivatives counterparties even if a CCP takes over clearing and settlement, which simply increases the average cost to banks of existing credit risk management processes.⁵⁰

2. Valuation Approach and Pricing Sources

As noted in the previous section, a benefit to OTC clearing through a CCP is the CCP's use of a single price to compute multilateral clearing balances and facilitate flows of funds for a given contract. Yet, if market participants disagree with the pricing source(s) used by the CCP, they may be reluctant to participate. Especially for relatively illiquid products in which dealers have invested considerable resources in their own pricing models, sharing those models with the CCP to contribute to the CCP pricing algorithm – or even just sharing prices themselves – may also generate opposition amongst some would-be clearing members.

3. Margin Modeling

Participants in OTC derivatives cleared through a CCP

⁵⁰ See, *e.g.*, Brickell (2010).

must also agree with the CCP's approach for modeling risk and computing clearing member margin requirements. Margin requirements set too low will generate concerns about the financial integrity of the CCP, whereas excessive margin requirements will be viewed as too high a cost to pay for CCP clearing. Even if the dollar amounts of margin requirements are not at issue, clearing members will presumably also want to be comfortable with the basic margin calculation methodology. A lack of comfort with the CCP's risk measurement methodologies could erode confidence in the overall risk management practices of the CCP.

C. Costs Imposed by OTC Clearing Through a CCP

1. Margin and Liquidity Risk

During normal market conditions, the cost of posting margin or collateral is relatively low for large financial institutions with easy access to debt markets. Because margin and collateral can be posted in interest-bearing assets, the main cost of margin and collateral is the opportunity cost of possibly holding more low-risk bonds or cash than the firms might otherwise want (Telser, 1981a).

The cost of margin and collateral can be much higher during periods in which derivatives participants are liquidity constrained. In that sense, the most significant cost of margin and collateral is the potential for firms to face margin or collateral calls at a time when their liquid assets are already heavily depleted and their access to short-term margin loans is limited.

A crucial distinction between OTC collateral and CCP margin is the frequency with which mark-to-market collateral calls occur and what triggers them. In CCP regimes, positions are marked to market and resettled at least twice daily. In OTC derivatives, mark-to-market resettlement intervals are determined by the counterparties to individual transactions, but are in general less frequent than twice-a-day. Collateral movements on OTC derivatives, moreover, can be triggered by credit events (e.g., downgrades) that accompany increases in exposure. If the contract is not re-settled frequently and subject to those kinds of discrete collateral calls, the resulting collateral movements could be significantly larger than twice-daily CCP margining.

The timing of margin and collateral flows has both costs and benefits for different derivatives market participants. For OTC derivatives dealers, the more frequent and often smaller margin flows probably expose these firms to lower risks of precipitous liquidity shocks of the kind seen in 2008. Yet, for end users of derivatives with limited debt capacity and high leverage, the cash flow volatility of futures and

other CCP-cleared products can be disruptive to treasury and cash management operations. At the other extreme, well-capitalized and highly-rated corporate end users with easy access to unsecured borrowing may find mandatory margin requirements to be unnecessarily burdensome.⁵¹

2. Netting and Reliance on Short-Term Funding

During the financial crisis of 2007 and 2008, the reliance of financial institutions on short-term debt made them particularly vulnerable to the outbreak of problems in the subprime mortgage and leveraged loan markets. Indeed, excessive reliance by dealer banks on short-term funding markets has been cited by many as an important contributor to the severity of the financial crisis.⁵²

Assets pledged as collateral in OTC derivatives and as margin in OTC-cleared derivatives often must be financed in short-term funding markets. Even if not, pledging assets as collateral or margin prevents the institution from using those assets as collateral for other short-term borrowings. Especially with the heightened sensitivity of market participants to over-reliance on short-term funding markets, the total collateral and margin requirements faced by institutions across their OTC, OTC-cleared, and exchange-traded derivatives activities is of great importance for liquidity risk management purposes.

The liquidity risk of collateral on OTC derivatives is significantly reduced by bilateral netting. Cross-product bilateral netting under a single master netting agreement, moreover, can encompass a wide range of financial transactions between dealers, thus potentially adding to these efficiency gains and reducing overall collateral requirements.

Whether or not netting efficiencies within a CCP regime are risk-reducing and efficiency enhancing *vis-à-vis* bilateral netting for OTC derivatives is an empirical question. If OTC derivatives on a single asset class (e.g., CDSs) are moved into a CCP, the loss of *bilateral* netting efficiency must be compared with the gains from *multilateral* netting efficiency (Duffie and Zhu, 2010).

Netting efficiency, moreover, is not simply a question of bilateral versus multilateral – it is also an issue of *cross-product* netting efficiencies. The comparable gains from netting margin requirements for CCP-cleared derivatives depend on the exact mechanism by which portfolio margin requirements are calculated by the CCP. The Standard Portfolio Analysis of Risk (SPAN®) margin system used by many futures exchange clearinghouses, for example, allows margin offsets and reductions for certain offsetting positions.

⁵¹ See Murphy (2009) and Brickell (2010).

⁵² See, e.g., Diamond and Rajan (2009), Duffie (2010), Financial Crisis Inquiry Commission (2010), and Gorton (2010).

Long Eurodollar futures and short Eurodollar futures in the same expiration month, for example, are offset so that total margin required is based only on the net position. Additional offsets may be permitted for other contracts depending on the degree of correlation between products – e.g., long Eurodollars and short Eurodollars with different maturities.

For some market participants, CCP clearing of OTC derivatives will represent a potential efficiency enhancement in collateral utilization. For others, CCP clearing will increase total collateral and margin requirements. The total net effect on a firm's collateral, liquidity, and reliance on short-term funding markets depends on the specific product mix and number of counterparty relationships that the firm has.

3. Excessive Standardization

CCP clearing requires at least some degree of standardization in the clearing process. Yet, OTC clearing initiatives to date have shown a capacity to provide coverage for a wide range of products. The more than 600 OTC-cleared energy swaps offered by the CME through its ClearPort facility, for example, far exceeds the number of listed exchange-traded energy derivatives.

Nevertheless, customized OTC transactions – the original *raison d'être* of the OTC derivatives market – may pose too many practical problems for CCPs to clear. Some pundits, moreover, have obscured some of the issues here by confusing “customized” with “complicated.” A grain elevator that wants to manage the risk of grain price fluctuations at specific delivery points on specific dates, for example, may be unable to do so through OTC-cleared agricultural products – not because the grain elevator's exposure is particularly complex, but just because it is date- and location-specific. Being forced to use an OTC-cleared swap with standardized dates and delivery points thus would give rise in this example to basis risk, and the grain elevator might well opt to do a customized OTC transaction *offshore* in lieu of taking the basis risk in the OTC-cleared swap.

4. Adverse Selection

To the extent that CCPs try and provide clearing and settlement services for non-standard or complex OTC derivatives, CCP risk managers are likely to be at a serious informational disadvantage to clearing members (Pirrong, 2009a, 2009b). That will complicate risk management and make it more difficult for the CCP to police the market and preserve the financial integrity of the clearinghouse.

Consider, for example, a large clearing member participating in one of the recent CDS clearing initiatives. Now imagine the clearing member is clearing customer and proprietary

positions on CDSs based on *its own debt*. CCPs will likely have to institute rules and procedures to deter such activity.

Even when the information clearing members have does not pertain to their own financial condition, however, dealers likely have much better information about the pricing and risk of complex OTC transactions, and the CCP knows that. The CCP, thus, will be (or at least will perceive itself as being) at an informational disadvantage to clearing members. In a classic adverse selection sense, the CCP will essentially be forced to assume the worst-case information asymmetry and will have to compensate with excessively conservative margin requirements, capital requirements, and other risk management policies and procedures. Added up, all those extra costs could make OTC clearing uneconomic for certain dealers and products.

IV. A New Era of Regulatory Uncertainty

A. The Dodd-Frank Act

The Dodd-Frank Act passed in July 2010 initiates a sweeping overhaul of the US financial regulatory system. Eleven different federal agencies are charged with promulgating about 250 new regulations under the Act (Packman, 2010). Included in those new regulations are significant changes in the regulatory framework for OTC derivatives.

1. Mandatory Clearing for OTC Derivatives

In the new regulatory regime, the CFTC has jurisdiction over swaps, swap dealers, and major swap participants. The SEC has jurisdiction over security-based swaps and firms that are dealers and major participants in security based swaps.

One of the lynchpins of the new regulatory regime is the mandatory clearing requirement for OTC derivatives. The Dodd-Frank Act states: “It shall be unlawful for any person to engage in a swap unless that person submits such swap for clearing to a derivatives clearing organization...if the swap is required to be cleared.”^{53, 54} Furthermore, the Act requires the CFTC or SEC to promulgate rules “to prevent evasions of the mandatory clearing requirements under this Act.”⁵⁵

On the important question of which swaps are “required to be cleared,” the Act is essentially silent. Instead, the

⁵³ The Act contains separate sections that deal with swaps and security-based swaps. For simplicity, I quote and discuss only those sections pertaining to swaps. The Act contains parallel language in many cases for security-based swaps.

⁵⁴ Dodd-Frank Act §723.

⁵⁵ Dodd-Frank Act §723.

Act delegates authority to the CFTC and the SEC to make determinations on an ongoing basis about which swaps and security-based swaps are required to be cleared. The agencies are obliged to take into account various factors in making these determinations, including the following: total notional exposures outstanding; trading liquidity; availability of pricing data; operational and credit infrastructures to support product clearing; systemic risk; and the like.

The Act provides an important exclusion known as the “Commercial End User Exemption (Anenberg et. al. 2010).” Under this exemption, swaps need not be submitted for mandatory clearing if one of the parties is a non-financial firm using the swap to hedge or reduce risk, provided that the firm notifies the CFTC or SEC and explains how it meets its financial obligations arising from the non-cleared swap.

2. Regulation of CCPs

Derivatives clearing organizations are required under the Act to comply with certain “core principles,” including principles pertaining to the following: financial resources; admission and ongoing eligibility requirements for clearing members and cleared financial products; risk management (including credit exposure measurement and monitoring of members, margin requirements, and financial safeguards to absorb default-related losses); settlement procedures; protection of funds; default resolution procedures; rule enforcement; systems safeguards; reporting and recordkeeping; disclosure and sharing of information; antitrust considerations; and others.⁵⁶

3. Systemic Risk and Financial Market Utilities

The Bank for International Settlements (BIS) defines systemic risk as “the risk that the illiquidity or failure of one institution, and its resulting inability to meet its obligations when due, will lead to the illiquidity or failure of other institutions (BIS, 1990).” Concerns about the “systemic risks” posed by OTC derivatives and their major users have been a significant driver in the regulatory reform debate over the past two years.⁵⁷

The Dodd-Frank Act defines a “Financial Market Utility” (FMU) as “any person that manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities, or other financial transactions among financial institutions or between

financial institutions and the person.”⁵⁸ The newly created Financial Stability Oversight Council (FSOC) must designate by a two-thirds vote which FMUs are or are likely to become “systemically important.”⁵⁹ The voting members of the FSCO are the Secretary of the Treasury, the Director of the newly established Bureau of Consumer Financial Protection, the Comptroller of the Currency, the Chairmen of the SEC, CFTC, Federal Deposit Insurance Corporation, Federal Housing Finance Authority, Federal Reserve Board, and National Credit Union Administration Board, as well as one independent member appointed by the President.⁶⁰

If a derivatives clearing organization is designated to be a systemically important FMU (a “designated FMU”), it becomes subject to certain additional risk management standards and requirements. If the designated FMU is a clearinghouse already regulated by the CFTC or SEC, those regulators are charged with the primary administration of any new rules. The Federal Reserve Board, however, is given ultimate oversight authority and may intercede if it deems existing regulations as insufficient to mitigate systemic risk.⁶¹

In addition, designated FMUs will be subject to examination by their primary regulator at least once a year. The examination is intended to enable the regulator to assess the nature of the operations and risks borne by the FMU, the risks to which the FMU may expose other significant financial market participants, the resources and capabilities of the designated FMU to monitor and control such risks, the safety and soundness of the FMU, and the FMU’s regulatory compliance.⁶²

The Act also gives systemically important clearing organizations access to the Federal Reserve discount window. As is the case with commercial banks, FMU borrowing from the Federal Reserve is limited to “unusual or exigent circumstances” and requires the approval of a majority of Federal Reserve Governors. The FMU also must demonstrate that it “is unable to secure adequate credit accommodations from other banking institutions.”⁶³

⁵⁶ Dodd-Frank Act §725.

⁵⁷ For informative commentaries on systemic risk in the context of the credit crisis that are *not* singularly focused on OTC derivatives, see Wallison (2008,2009), French et. al. (2010), Gorton (2010), and Rajan (2010).

⁵⁸ Dodd-Frank Act §803.

⁵⁹ Dodd-Frank Act §804.

⁶⁰ Dodd-Frank Act §111.

⁶¹ Dodd-Frank Act §805.

⁶² Dodd-Frank Act §807.

⁶³ Dodd-Frank Act §806.

B. Problems to Which Mandated Clearing May Give Rise

From a public policy perspective, mandatory clearing for at least some OTC derivatives is now a *fait accompli* in the United States. Nevertheless, the potential risks and costs of mandatory clearing that were discussed at length leading up to the enactment of the Dodd-Frank legislation are still present.⁶⁴ Those risks and costs must be carefully monitored by market participants and regulators alike to help ensure that the “solution” promulgated in the Dodd-Frank Act is not greater than the problem that the legislation was intended to address.

1. Legal and Regulatory Uncertainty

Recall from Section I-A that until 2000, US derivatives regulation was plagued by jurisdictional infighting between the SEC, CFTC, and other regulators and by litigation over the legal and regulatory classification of certain products. The Dodd-Frank Act is likely to resurrect those old legal and regulatory uncertainties in new ways.

The Dodd-Frank Bill defines a “swap” as:

[A]ny agreement, contract, or transaction—(i) that is a put, call, cap, floor, collar, or similar option of any kind that is for the purchase or sale, or based on the value, of one or more interest or other rates, currencies, commodities, securities, instruments of indebtedness, indices, quantitative measures, or other financial or economic interests or property of any kind; (ii) that provides for any purchase, sale, payment, or delivery (other than a dividend on an equity security) that is dependent on the occurrence, nonoccurrence, or the extent of the occurrence of an event or contingency associated with a potential financial, economic, or commercial consequence; (iii) that provides on an executory basis for the exchange, on a fixed or contingent basis, of one or more payments based on the value or level of one or more interest or other rates, currencies, commodities, securities, instruments of indebtedness, indices, quantitative measures, or other financial or economic interests or property of any kind, or any interest therein or based on the value thereof, and that transfers, as between the parties to the transaction, in whole or in part, the financial risk associated with a future change in any such value or level without also conveying

a current or future direct or indirect ownership interest in an asset (including any enterprise or investment pool) or liability that incorporates the financial risk so transferred, including any agreement, contract, or transaction commonly known as—(I) an interest rate swap; (II) a rate floor; (III) a rate cap; (IV) a rate collar; (V) a cross-currency rate swap; (VI) a basis swap; (VII) a currency swap; (VIII) a foreign exchange swap; (IX) a total return swap; (X) an equity index swap; (XI) an equity swap; (XII) a debt index swap; (XIII) a debt swap; (XIV) a credit spread; (XV) a credit default swap; (XVI) a credit swap; (XVII) a weather swap; (XVIII) an energy swap; (XIX) a metal swap; (XX) an agricultural swap; (XXI) an emissions swap; and (XXII) a commodity swap; (iv) that is an agreement, contract, or transaction that is, or in the future becomes, commonly known to the trade as a swap; (v) including any security-based swap agreement which meets the definition of ‘swap agreement’ as defined in section 206A of the Gramm-Leach-Bliley Act (15 U.S.C. 78c note) of which a material term is based on the price, yield, value, or volatility of any security or any group or index of securities, or any interest therein; or (vi) that is any combination or permutation of, or option on, any agreement, contract, or transaction described in any of clauses (i) through (v).⁶⁵

The Act also contains certain exclusions from these definitions. For example, physically settled contracts for the future delivery of a non-financial commodity are excluded from the definition of a “swap.” The Act also contains a number of other definitions regarding products (*e.g.*, security-based swaps) and institutions (*e.g.*, “major swap participant”). As noted in Section V-A-1, moreover, the Act provides a “Commercial End User Exemption,” and ultimate authority for determining which swaps and security-based swaps are required to be cleared is vested with the CFTC and SEC.

The actual process by which the CFTC, SEC, and clearinghouses will evaluate financial products to determine if they must be cleared is still uncertain. The Act states, for example, that the CFTC shall review on an ongoing basis “each swap, or any group, category, type, or class of swaps to make a determination as to whether the swap or group, category, type, or class of swaps should be required to be cleared” and “shall provide a 30-day public comment period” on such determinations.⁶⁶ In addition, CCPs are required to submit products that they plan to clear to the CFTC or SEC for review. The CFTC and SEC then have 90

⁶⁴ See, *e.g.*, “The Derivatives End Game,” *New York Times* (June 24, 2010), and “Volcker and Derivatives: The End Game for Financial Reform,” *Wall Street Journal* (June 24, 2010).

⁶⁵ Dodd-Frank Act §721.

⁶⁶ Dodd-Frank Act §723.

days to determine whether or not the swap must be cleared.⁶⁷

Without further details from the agencies, speculation about how this process will work is premature. Yet, the history of derivatives regulation suggests that market participants have cause for concern. Subjective determinations like those contemplated under the Act are a recipe for legal and regulatory uncertainty, controversy and delays in new product development, and inter-agency turf wars.

Whether or not a swap is subject to mandatory clearing, moreover, also determines the means by which the swap must be *traded*, as well. Under the Dodd-Frank Act, swaps that are subject to the mandatory clearing requirement must also be traded on a regulated exchange or swap execution facility.⁶⁸

OTC-cleared derivatives may also pose certain challenges to firms with significant dealings across jurisdictions and borders (Morrison, 2010). Swaps booked under master netting agreements allow counterparties to choose the governing law for their contracts. In the event of the insolvency of one party, the local bankruptcy or insolvency law takes over. OTC-cleared derivatives, however, offer no such flexibility. OTC-cleared derivatives are bound by the insolvency laws and regulations of the jurisdiction in which the CCP is domiciled. Especially as other major financial centers around the world adopt changes in their own financial regulatory regimes, these differences could result in significant discontinuities in the regulatory treatment of OTC-cleared derivatives. That could in turn give rise to regulatory arbitrage, as well as regulatory and legal uncertainty.

2. Concentrations of Risk in CCPs

Shifting significant amounts of derivatives exposures into CCPs is only risk-reducing to the extent that the CCPs themselves provide higher-quality counterparty exposures than alternative bilateral credit risks or credit risks associated with DVP Agents. In other words, mandated CCP clearing of OTC derivatives puts all the credit exposure of the cleared products in just a few places. As the 1992 Promisel Report of the BIS warned, “The most commonly cited events capable of triggering systemic problems were the default of [a large dealer] and clearing and settlement failures, including exchange shut-downs (BIS, 1992).”

To date, the major CCPs around the world have demonstrated remarkable skill and conservatism in managing risk. Indeed, prudential risk management and financial integrity are two of the main ways that CCPs compete with one another to attract OTC-cleared derivatives volume. In a mandated OTC clearing world, however, those competitive

forces will be diminished, which could attenuate the incentives for clearinghouses to maintain the state-of-the-art risk management systems and processes for which they are so well-known. That may not be a big problem for existing and established major CCPs – guarding the reputations they have spent years earning likely will overpower the reduced competitiveness resulting from a more pronounced role for regulators. However, the new clearing revenues to which the Dodd-Frank Act gives rise may well attract more marginal clearinghouse entrants whose risk management standards only just meet the regulatory minimums.

Although the Act contains certain protections that allow CCPs to refuse to clear products that they deem excessively risky or that would jeopardize the financial integrity of the clearinghouse, CCPs designated as systematically important FMUs may still incur potentially substantial new compliance costs. The combination of those costs and the increased risk exposures arising from the new throughput that the Act will engender could also increase the cost of raising equity for CCPs. That, in turn, would make it even more expensive for CCPs to maintain sufficient equity to preserve their target leverage ratios, credit quality, and financial integrity.

3. Systemic Risk, Moral Hazard, and Access to the Federal Safety Net

During the credit crisis, several notable interventions and bailouts have already given credence to the notion that the government does indeed view some firms as too-big-to-fail – or, rather, too-important-to-fail (TITF). Mandating that a significant portion of OTC derivatives be cleared by a regulated and recognized CCP could easily concentrate credit risk *so much* in those CCPs that they become regarded *by market participants* as TITF.⁶⁹ And that, in turn, could give rise to a moral hazard problem in which derivatives participants begin to manage their risks less prudently because of an expectation that derivatives CCPs would be bailed out.

The BIS issued a stern warning about this potential problem in its 1990 Lamfalussy Report:

Central banks also have a common interest in seeking to ensure that their efforts to limit systemic risk do not lead to undesirable risk taking by banks. Banks’ incentives to control the riskiness of their activities could be weakened if a perception that central banks will absorb risks or take action to limit their systemic consequences is generated. Indeed, as the perceived likelihood of central bank support grows market participants may engage in increasingly risky activities. The design and operation of private interbank netting and settlement

⁶⁷ Dodd-Frank Act §723.

⁶⁸ Dodd-Frank Act §723.

⁶⁹ See, e.g., Wyatt (2010).

systems may be particularly susceptible to this problem of “moral hazard.” The number of participants in such systems and the scope of their activities may lead the market to presume that central banks would act to avert a system’s settlement failure. As a result, the moral hazard involved in privately-operated interbank netting systems is that, because of the possible presumption that central bank support will be forthcoming, such systems may be designed without sufficient regard to the need for built-in mechanisms and incentives to control risks and deal with the consequences of a settlement failure (BIS, 1990, p. 9).

The designation of a CCP as a “systemically important” FMU may exacerbate this potential problem. Because derivatives clearinghouses now may have access to the Federal Reserve discount window during times of financial duress, market participants and regulators may be even more likely to conclude that the Federal Reserve regards those institutions as TITF.

Worse still, CCPs themselves may begin to view their activities as protected by the same federal safety net that bailed out nearly the whole U.S. banking sector in 2008 and 2009. Former President of the Federal Reserve Bank of Minneapolis Gary Stern stated, “This is the classic moral hazard dilemma. My preference would be not to cover [CCPs] explicitly. I think you’ll get better private sector preparation (Lynch, 2010).”

4. Competitiveness Considerations

Mandating OTC clearing for certain products must also be considered in the context of competitiveness. OTC derivatives users wishing to avoid mandatory CCP usage may simply pursue bilateral contracting in other jurisdictions with a secure, clear legal and regulatory infrastructure but that do not adopt mandatory clearing measures. That could adversely impact the competitiveness of the US financial services industry.

The Act also contains an open access requirement. Specifically, the Act requires that the rules of a derivatives clearinghouse must “provide for non-discriminatory clearing of a swap...executed bilaterally *or on or through the rules of an unaffiliated designated contract market or swap execution facility*.”⁷⁰ In other words, CCPs will presumably be unable to refuse clearing or charge more to clear swaps designated for mandatory clearing and traded on an exchange or facility that competes with any exchange affiliate of the CCP.

The open access provision could have potentially significant negative impacts on the competitiveness of the derivatives clearing industry. The incentive of vertically integrated exchanges and CCPs to recover investment costs for research

and development into new, complementary execution and clearing solutions, for example, could be greatly attenuated. The significant economies of scope and scale between execution and clearing, moreover, will be much harder to realize in an environment where clearinghouses are not permitted to provide differential pricing to their own affiliates. That in turn could raise total costs to market participants.⁷¹

V. Conclusion

The fundamental problem with regulating financial products (instead of the institutions that use them) is that product innovation is generally one step ahead of product regulation. Today’s product regulations thus often end up addressing yesterday’s problems. That is the nature of the dynamic relationship between regulation and financial innovation (Kane, 1988; Miller, 1986,1992). No matter how capable the regulator, it is a practical impossibility for regulation to consider all possible financial innovations and to define all possible financial products, thus rendering legal and regulatory uncertainties nearly inevitable in a product-based regulatory regime (Smith, 2003).

The regulations authorized by the Dodd-Frank Act will not begin to appear in earnest until 2011 and in some cases 2012. Until then, how agencies like the CFTC, SEC, and Federal Reserve will implement these new regulations remains largely unknown. And in the meantime, the growth and development of OTC-cleared derivatives will likely continue if not expand further in anticipation of the new law.

As Dodd-Frank regulations are promulgated, however, the evolution of OTC-cleared derivatives may begin to change. In the past decade, OTC-cleared derivatives have enjoyed tremendous growth, but that growth has occurred in markets and products where CCPs and derivatives participants alike perceived the benefits of OTC clearing as exceeding its costs. For some participants and products, however, the benefits of OTC-cleared derivatives have *not* exceeded the costs.

As regulation begins to displace competition, the benefit/cost calculus will be tilted by the new mandatory clearing requirements. That may disrupt the market-driven evolution we have seen in the past decade. It is too early to tell exactly what the new world of regulation-driven OTC-cleared derivatives will look like, but for at least some market participants – and perhaps some clearinghouses – it may not be an advantageous one. ■

⁷⁰ Dodd-Frank Act §723.

⁷¹ See Pirrong (2008).

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