

June 2007

# CREDIT DERIVATIVES

Confirmation  
Backlogs Increased  
Dealers' Operational  
Risks, but Were  
Successfully  
Addressed after Joint  
Regulatory Action





Highlights of [GAO-07-716](#), a report to congressional requesters

## Why GAO Did This Study

Over-the-counter (OTC) credit derivatives are privately negotiated contracts that allow a party to transfer the risk of default on a bond or loan to another party without transferring ownership. After trading in these products grew dramatically in recent years, backlogs of thousands of trades developed for which dealers had yet to formally confirm the trade terms with end-users—such as hedge funds, pension funds, and insurance companies—and other dealers. Not confirming these trades raised the risk that losses could arise.

GAO was asked to review (1) what caused the trade confirmation backlogs and how they were being addressed and (2) how U.S. financial regulators were overseeing dealers' credit derivative operations, including the security and resiliency of the information technology systems used for these products. GAO analyzed data on credit derivatives operations that dealers submitted to regulators, reviewed regulatory examination reports and work papers, and interviewed regulators, dealers, end-users, and industry organizations.

[www.gao.gov/cgi-bin/getrpt?GAO-07-716](http://www.gao.gov/cgi-bin/getrpt?GAO-07-716).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Yvonne Jones at (202) 512-8678 or [jonesy@gao.gov](mailto:jonesy@gao.gov).

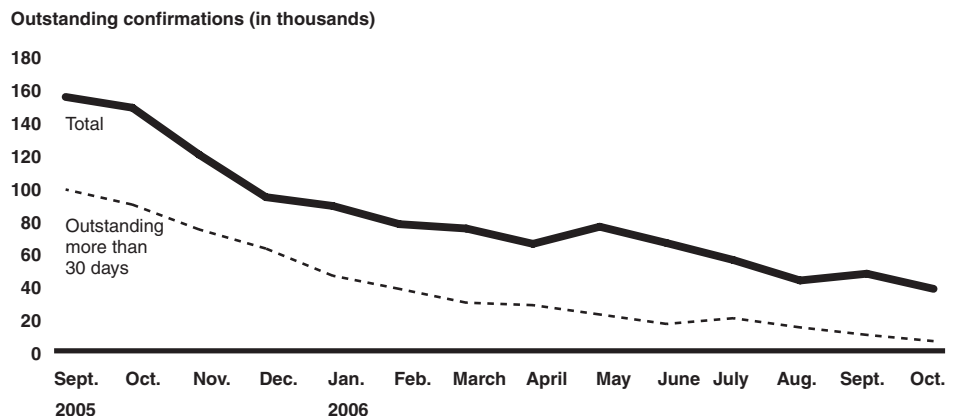
## CREDIT DERIVATIVES

# Confirmation Backlogs Increased Dealers' Operational Risks, but Were Successfully Addressed after Joint Regulatory Action

## What GAO Found

After trading volumes grew exponentially between 2002 and 2005, the 14 largest credit derivatives dealers—including U.S. and foreign banks and securities broker-dealers—accumulated backlogs of unconfirmed trades totaling over 150,000 in September 2005. These backlogs resulted from reliance on inefficient manual confirmation processes that failed to keep up with the rapidly growing volume and because of difficulties in confirming information for trades that end-users transferred to other parties without notifying the original dealer. Although these trades were being entered into the systems that dealers used to manage the risk of loss arising from price changes (market risk) and counterparty defaults (credit risk), the credit derivatives backlogs increased dealers' operational risk by potentially allowing errors that could lead to losses or other problems to go undetected. In response, a joint regulatory initiative involving U.S. and foreign regulators directed the 14 major dealers to work together to reduce the backlogs and address the underlying causes. By increasing automation and requiring end-users to obtain counterparty consent before assigning trades, the 14 dealers reduced their total confirmations outstanding more than 30 days by 94 percent to 5,500 trades by October 2006, as shown in the figure below.

**Outstanding Confirmations at 14 Major Dealers, September 2005 to October 2006**



Source: GAO analysis of Markit Group data.

Through ongoing supervision and examinations, U.S. banking and securities regulators became aware of the credit derivatives backlogs as early as late 2003 and had been monitoring efforts taken by each dealer to reduce its backlog. Under the joint regulatory initiative, regulators obtained aggregate data from the dealers that allowed regulators to better monitor how backlogs were being resolved. Recognizing the potential for similar problems to arise in other OTC derivatives markets, regulators began obtaining similar data for other OTC derivative products in November 2006.

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## **Abbreviations**

BIS	Bank for International Settlements (Basel, Switzerland)
CSE	Consolidated Supervised Entity
FSA	Financial Services Authority (United Kingdom)
FRBNY	Federal Reserve Bank of New York
DTCC	Depository Trust and Clearing Corporation
ISDA	International Swaps and Derivatives Association
LIBOR	London Interbank Offered Rate
OCC	Office of the Comptroller of the Currency
OTC	over the counter
SEC	Securities and Exchange Commission

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United States Government Accountability Office  
Washington, DC 20548

June 13, 2007

Congressional Requesters

Until late 2005, the growth in trading volume of over-the-counter (OTC) credit derivatives had greatly outpaced the processing capabilities of the financial firms offering these products—heightening the operational risk that such firms could incur losses from human errors or system failures. OTC credit derivatives are privately negotiated contracts that allow a party to transfer the risk of default on a bond or loan to another party without transferring ownership. In a credit default swap, for example, a bond investor agrees to pay a periodic premium to a financial firm in exchange for the firm’s agreement to compensate the bond investor for any losses if the bond issuer defaults on the bonds. Like other OTC derivatives, credit derivatives are typically bought and sold through dealers, namely banks and securities broker-dealers, that stand ready to buy or sell credit derivatives to end-users, such as hedge funds, pension funds, and insurance companies. Although OTC trading in credit derivatives is not regulated in the United States, the dealers are subject to supervision by their respective regulators, including U.S. banking and securities regulators.<sup>1</sup>

Introduced in the early 1990s, credit derivatives surpassed a total notional amount of \$34 trillion at year-end 2006.<sup>2</sup> As trading volume grew exponentially in recent years, major dealers developed backlogs of thousands of trades for which the trade terms had not been formally confirmed with their counterparties, which included end-users and other dealers. Having unconfirmed trades could allow errors to go undetected at dealers and later result in losses, a situation that an official from the

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<sup>1</sup>The Securities and Exchange Commission has antifraud authority over credit derivatives that are “security-based swap agreements,” as defined in Section 206B of the Gramm-Leach-Bliley Act (15 U.S.C. 78c note). See, e.g., Section 10(b) of the Securities Exchange Act of 1934 (15 U.S.C. 78j(b)).

<sup>2</sup>The notional amount is the amount upon which payments between counterparties to certain types of derivatives contracts are based. For credit derivatives, the notional amount serves as the basis for determining the periodic premium payment made by one party to another in return for compensation in the event of loss from a default. In this regard, the credit derivatives market’s notional amount is an indicator of the market’s volume but does not necessarily represent the credit and market risks to which counterparties are exposed from their credit derivatives contracts.

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United Kingdom's regulator of credit derivatives dealers characterized as "an accident waiting to happen."

Given the concerns about the inability of the credit derivatives market's infrastructure to keep up with the growth in trading volume, you asked us to review the causes of the confirmation backlogs and the steps U.S. financial regulators were taking to address the issue. This report discusses (1) what caused the backlogs and the steps being taken to address them and (2) U.S. financial regulators' oversight of the operational risk that dealers faced from the backlog in credit derivatives confirmations, including the security and resiliency of related information technology systems.<sup>3</sup>

To determine the causes of the backlogs and the steps that are being taken to address these issues, we analyzed the trading volume of credit derivatives, confirmation backlogs, and other transactional data provided by major dealers of credit derivatives to U.S. and foreign regulators through Markit Group, a provider of independent data, portfolio valuations, and trade processing for OTC derivatives. We examined the procedures that this firm employs to collect and analyze the data and determined that the data were sufficiently reliable for our purposes. We also reviewed and analyzed reports on the credit derivatives market by industry associations, international organizations, firms, and academics. We interviewed eight dealers of credit derivatives, a hedge fund, and various industry trade organizations, including organizations representing OTC derivatives dealers and derivatives end-users, including the International Swaps and Derivatives Association (ISDA). To determine how dealers' exposures to operational risks associated with credit derivatives were being supervised, we interviewed staff from the Federal Reserve, including its examiners for two banks; the Office of the Comptroller of the Currency (OCC), including examiners for three banks; the Securities and Exchange Commission (SEC); and the United Kingdom's Financial Services Authority (FSA). We also reviewed and analyzed examinations conducted between 2004 and 2006 by the Federal Reserve and the OCC on the activities in credit derivatives of five banks and by the SEC covering the holding companies of five securities broker-

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<sup>3</sup>While organized futures exchanges recently announced their plans to offer credit derivatives, our report discusses only credit derivatives traded in the OTC derivatives market. In addition, although concerns have been raised about the potential for credit derivatives to raise systemic risk and be used to trade on insider information, our report addresses only the operational risks raised by credit derivatives.

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dealers that engage in credit derivatives activities. We conducted our work in Charlotte, North Carolina; Chicago; New York; and Washington, D.C., from August 2006 to March 2007 in accordance with generally accepted government auditing standards. Appendix I provides a detailed description of our scope and methodology.

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## Results in Brief

Two factors largely led to the substantial backlogs of unconfirmed trades that dealers had amassed by 2005, though regulators, dealers, and others have since made considerable progress in reducing these backlogs. From 2002, trading volume in credit derivatives was expanding exponentially, with particularly rapid growth from 2004 to 2005, as the average number of trades done weekly at large dealers increased from 644 to 1,450. As a result, by the end of September 2005, 14 of the largest credit derivatives dealers had, in aggregate, over 150,000 unconfirmed trades, with nearly two-thirds of these remaining unconfirmed for more than 30 days. The delays in confirming trades largely resulted from (1) dealers and end-users relying on inefficient manual processes that could not adequately keep up with the rapidly growing volume and (2) the difficulty of confirming trade information after some end-users began frequently assigning their side of existing trades to new parties without notifying the original dealer. The backlog of unconfirmed trades created operational risk by potentially allowing trade errors to go undetected that could lead to losses and other problems. For example, undetected errors could result in legal disputes over contract terms and cause dealers to incorrectly measure and manage their market or credit risk.<sup>4</sup> To mitigate these risks, some dealers were informally verifying the key economic terms of trades with counterparties to ensure that trades were accurately recorded and risks were accurately measured, but the extent to which these practices were followed varied. According to regulators, the trade assignment practice posed a “collective action” problem because dealers could not individually stop the practice. As a result, in September 2005, U.S. and foreign financial regulators participated in a joint regulatory initiative organized by the Federal Reserve Bank of New York (FRBNY) and prompted the 14 major credit derivatives dealers to work together to reduce the number of unconfirmed trades and address the underlying causes of these backlogs. Using automated systems to confirm trades and adopting a protocol requiring

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<sup>4</sup>Market risk is the potential for loss because of a decrease in value of a credit derivative contract resulting from a change in market conditions. Credit risk is the potential for loss from the failure of the counterparty to perform on its credit derivative contract.

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end-users to obtain dealers' consent before assigning trades, the 14 dealers reduced the number of confirmations outstanding for more than 30 days by 94 percent (to around 5,500 trades) by the end of October 2006. Dealers and others are continuing to work to reduce operational risks, in part by further automating the market's infrastructure—for example, by developing a central depository to store virtually all trades and automate other processes.

U.S. bank and securities regulators had been overseeing the exposure of credit derivatives dealers to operational and other risks, but were better able to monitor the resolution of the backlog problem once they began receiving industrywide data under FRBNY's joint regulatory initiative. Through supervision and examinations, the pertinent U.S. federal bank regulators—the Federal Reserve and the OCC—became aware of the backlogs at U.S. banks engaged in credit derivatives activities as early as late 2003 and were monitoring banks' efforts to reduce their backlogs before the joint regulatory initiative. The securities regulator, SEC, was generally aware of the backlogs since late 2004, but SEC staff became more concerned about them through periodic discussions with broker-dealers subject to the SEC's Consolidated Supervised Entity (CSE) program during the summer of 2005. As part of their examinations, the bank and securities regulators have also been reviewing how these dealers maintained the security and resiliency of the information technology systems used for credit derivatives. Although U.S. and foreign regulators were aware of confirmation backlogs at individual dealers, none of the regulators oversaw all the dealers or had data on the size of the backlog industrywide. However, under the joint regulatory initiative begun in September 2005, the dealers have been providing the regulators with aggregate data on their backlogs and other operational measures, giving regulators an effective means for monitoring the industry's progress in reducing the backlogs. In recognition of the potential for similar operational problems to arise in other OTC derivatives markets, including OTC equity derivatives, U.S. and foreign regulators have begun to collect similar data for other OTC derivative products.

We provided a draft of this report to the Federal Reserve, OCC, and SEC for their review and comment. The Federal Reserve and SEC provided technical comments, which we incorporated as appropriate.



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## Background

Introduced in the early 1990s, credit derivatives have been widely adopted as a tool for allowing market participants to take on or reduce their exposure to credit risk. First used primarily by banks to reduce credit exposures stemming from loans made to clients, credit derivatives have evolved to include an array of different products (table 1). According to regulators and others, credit derivatives have the potential to improve the overall efficiency and resiliency of the financial markets by spreading credit risk more widely across a large and diverse pool of investors. According to the British Bankers' Association, single-name credit default swaps remain the most common type of credit derivative, comprising about 33 percent of the market in 2006, though their share of the market has decreased since 2004. These swaps allow the buyer of protection to transfer the credit risk associated with default on debt issued by a single corporation or sovereign entity—called the reference entity.<sup>5</sup> With a standard credit default swap, the buyer of credit risk protection pays a quarterly premium payment to the seller of credit risk protection over the life of the contract, typically 5 or more years. Should a defined credit event occur, such as a default by the specified corporation on the referenced debt, the protection seller would assume the losses.<sup>6</sup> As table 1 shows, other commonly traded products include full index trades, synthetic collateralized debt obligations, and tranching index trades.

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<sup>5</sup>Market participants can buy or sell credit derivatives for the purposes of speculating, arbitraging, or hedging, even if they do not have a direct exposure to the referenced entity.

<sup>6</sup>Credit events include, for example, failure to pay, restructuring, and bankruptcy.

**Table 1: Share of Market by Credit Derivative Product, 2006**

Credit derivative product	Market share (percentage)	Product description
Single-name credit default swaps	33%	Credit derivatives based on bonds from a single issuer, such as a corporation or a sovereign entity.
Full Index trades	30	Credit derivatives referencing multiple corporations or sovereign entities that are gathered into a standardized portfolio and offered to investors as one unit. Indexes are usually categorized by characteristics such as industry, geographic region, or credit quality.
Synthetic collateralized debt obligations	16	Credit derivatives referencing multiple corporations or sovereign entities and gathered into a standardized portfolio—customized for investors—and separated into various risk categories (or tranches) that vary by the likelihood of incurring losses. Obligations from the tranches are then sold to investors according to the desired risk/return profile.
Tranched index trades	8	Index trades that are divided into various risk tranches, with investors selecting the risk and return profile they prefer among the various risk categories in the standardized index.
Others <sup>a</sup>	13	A variety of special-purpose products that collectively represent a relatively small share of the credit derivatives market.
<b>Total</b>	<b>100%</b>	

Source: Percentages from British Bankers' Association and definitions from GAO analysis of multiple sources.

<sup>a</sup> "Others" include products that each account for less than a 6 percent share of the market.

In the credit derivatives market, banks and securities broker-dealers generally serve as the product dealers, acting as the buyer or seller in credit derivative trades with end-users or other dealers. The top five dealers in 2005, ranked by total trading volumes as estimated by Fitch Ratings, were Morgan Stanley, Deutsche Bank, Goldman Sachs, JP Morgan Chase, and UBS. End-users of credit derivatives include hedge funds,<sup>7</sup> insurance companies, pension funds, and mutual funds.<sup>8</sup>

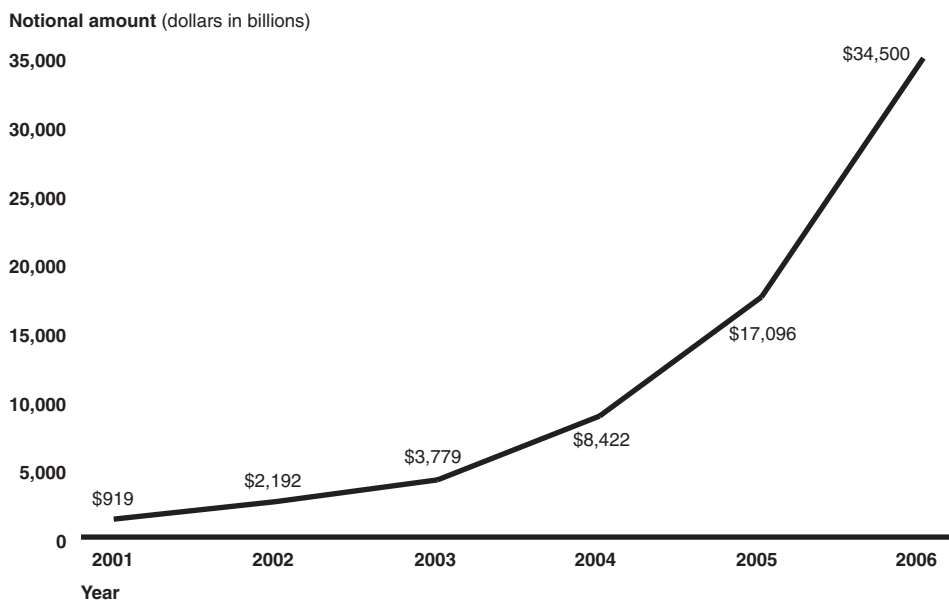
According to ISDA, which conducts periodic surveys of market participants, the credit derivatives market has grown dramatically in

<sup>7</sup>Hedge funds are generally considered private investment funds that are not required to register with SEC because of the limited number or sophisticated nature of their investors. Hedge funds commonly seek to achieve a positive, absolute return and invest in a wide variety of financial instruments, such as equity and fixed income securities, currencies, over-the-counter derivatives, and futures contracts.

<sup>8</sup>The top five end-users of credit derivatives are banks and broker-dealers (44 percent), hedge funds (32 percent), insurers (17 percent), pension funds (4 percent), and mutual funds (3 percent). Ross Barrett and John Ewan, *BBA Credit Derivatives Report 2006* (London: British Bankers' Association, September 2006).

recent years, increasing from an estimated total notional amount of nearly \$1 trillion outstanding at year-end 2001 to over \$34 trillion at year-end 2006 (see fig. 1).<sup>9</sup> Part of this rapid growth has been attributed to product innovation and an increasing number of market participants, particularly hedge funds. Despite its expansion, the credit derivative market is still much smaller than the OTC interest rate derivatives market, which had a total notional amount outstanding of around \$286 trillion at year-end 2006.<sup>10</sup>

**Figure 1: Total Notional Amount of Credit Default Swaps Market, 2001 to 2006**



Source: ISDA.

<sup>9</sup>ISDA is a global trade association representing market participants in privately negotiated derivative transactions, which are commonly called OTC derivatives. Since 2000, ISDA has conducted an annual operations benchmarking survey of its members to collect performance data on operations processing of OTC derivatives.

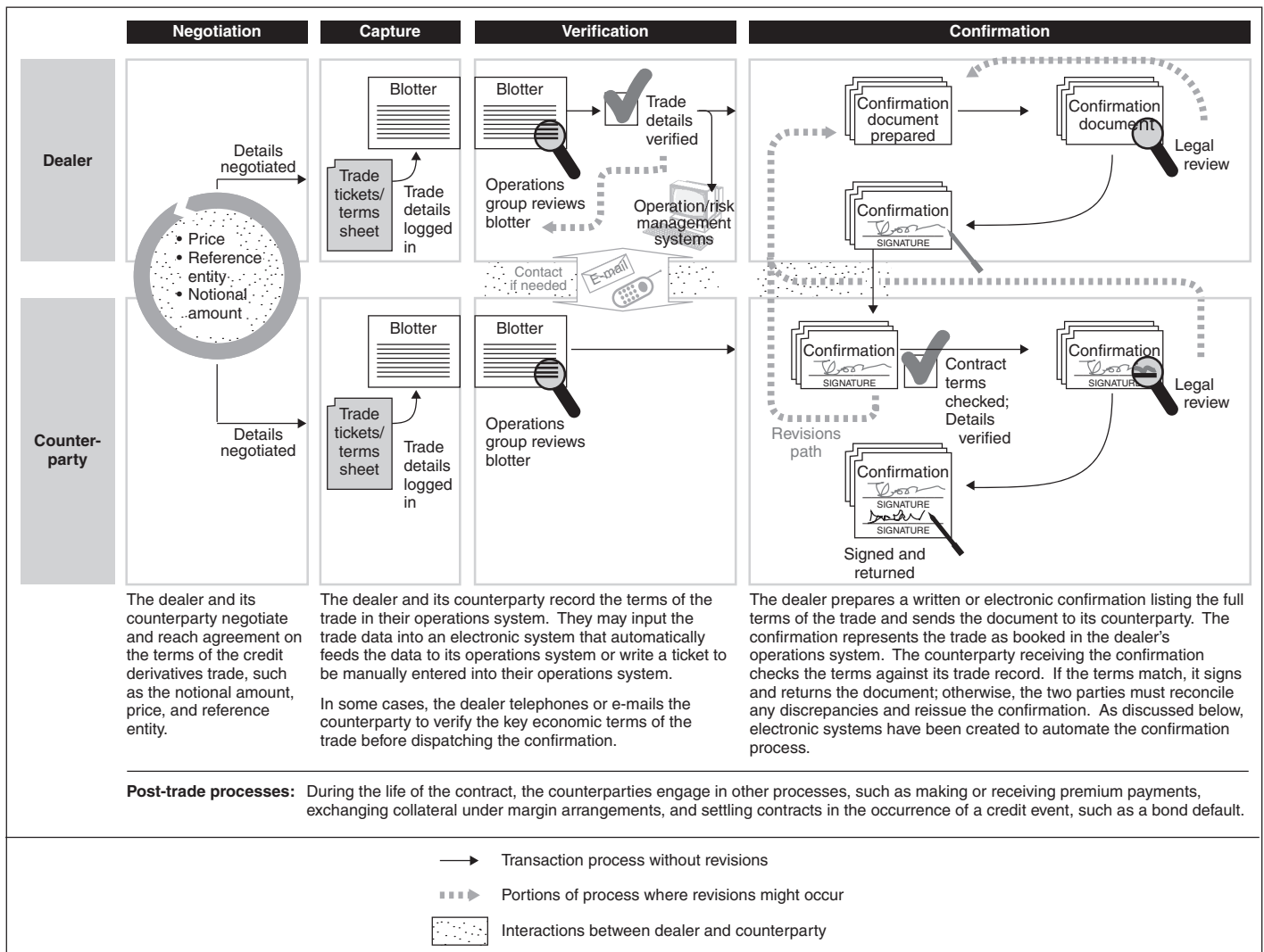
<sup>10</sup>The market for OTC interest-rate derivatives includes interest-rate swaps and options as well as cross-currency interest rate swaps. For example, an interest-rate swap is a transaction in which one party pays periodic amounts based on a specified fixed rate and the other party pays periodic amounts based on a specified floating rate that is reset periodically, such as the London Interbank Offered Rate, or LIBOR (the interest rate paid on interbank deposits in the international money markets).

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## Processing Credit Derivatives Trades

Traders and sales staff at dealers who interact with customers represent the dealer's "front office." The staff in the front office generally use electronic systems to capture the trade data and transmit it to the systems used to manage market and credit risk. Dealers also have "back offices," which include staff that record, verify, and confirm trades executed by the front office. As shown in figure 2, the steps for entering into and processing an OTC trade for credit derivatives include negotiation, capture, verification, and confirmation. These processes have been increasingly automated over time, but some remain manual. For example, a relatively small percentage of credit derivative products—generally those with more customized and complex terms—cannot be confirmed electronically. In addition, various post-trade processes occur during the life of a credit derivatives contract, including making or receiving premium payments, exchanging collateral, and settling contracts after a credit event occurs, such as a bond default.

**Figure 2: Steps for Processing a Credit Derivative Trade**



Source: GAO (based on material from Bearing Point, ISDA, and BIS).

Segregating these various duties into front and back office responsibilities serves to maintain operational integrity, such as by identifying data entry errors and to minimize fraud and other violations. Management responsibilities performed by the back office vary by institution, but they may include evaluating transactional exposure against established market and credit limits and risk management reporting. Some dealers have combined a number of the functions performed by the back office, such as

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risk management, into a middle office, and some use a separate risk management group.

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## Regulation of OTC Credit Derivatives

Because OTC credit derivative transactions occur between private parties and are not traded on regulated exchanges, they are not subject to regulation in the United States, provided that the parties and other aspects of the transaction satisfy requirements of the Commodity Exchange Act.<sup>11</sup> For credit derivatives that would otherwise be securities, the transactions fall within the definition of “swap agreement” in the Gramm-Leach-Bliley Act.<sup>12</sup> The Commodity Exchange Act allows unregulated derivatives trading in certain types of commodities by eligible parties under limited circumstances.<sup>13</sup> Similarly, the Commodity Exchange Act and the Securities Act of 1933 allow unregulated derivatives trading by eligible parties under limited circumstances.<sup>14</sup> Although the OTC credit derivatives products themselves are not regulated, certain market participants are. If the dealer is a U.S. bank federally chartered as a national bank, it is supervised by OCC. If a bank is owned by a bank holding company, its holding company is regulated by the Federal Reserve.<sup>15</sup> These bank regulators oversee these entities to ensure the safety and soundness of the banking system and the stability of the financial markets. If the credit derivatives dealer is a securities broker-dealer, it is overseen by SEC. According to U.S. regulators, some of the U.S. banks and securities broker-dealers also conduct credit derivatives trades in foreign affiliates subject to foreign regulation. Similarly, other participants in the credit derivatives market include foreign banks that are supervised by foreign regulators

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<sup>11</sup>7 U.S.C. §§ 1 – 25, as amended.

<sup>12</sup>15 U.S.C. 78c note.

<sup>13</sup>Under the Commodity Exchange Act, credit derivatives transactions generally are not subject to regulation if the transactions are between “eligible contract participants” (as defined in the act) and either do not take place on a “trading facility” or occur only on an electronic trading facility and are conducted on a principal-to-principal basis or are subject to individual negotiation by the parties. See 7 U.S.C. §§ 1a(12), 1a(13), 2(d), 2(g).

<sup>14</sup>The Securities Exchange Act of 1934 and the Securities Act of 1933 each exclude from the definition of security both “security-based swap agreements” and “non-security-based swap agreements,” as defined in Sections 206B & C of the Gramm-Leach-Bliley Act (15 U.S.C. 78c note). See 15 U.S.C. 78c-1 and 15 U.S.C. 77b-1. However, SEC has antifraud authority over credit derivatives that are security-based swap agreements. See note 1.

<sup>15</sup>For a more detailed description of the regulation of banks and securities broker-dealers, see GAO, *Financial Regulation: Industry Changes Prompt Need to Reconsider U.S. Regulatory Structure*, [GAO-05-61](#), (Washington, D.C.: October 2004).

and, in some cases, also by U.S. regulators if operating in the United States.

## Manual Processes and Trade Assignments Led to Backlogs of Unconfirmed Trades at Dealers, but Industry Efforts Have Significantly Reduced the Backlogs

As the credit derivatives market grew, lack of automation and other factors led to large backlogs of unconfirmed trades at dealers. The eight dealers we interviewed told us that they began to experience a significant increase in their backlogs of unconfirmed trades ranging from the middle of 2003 to the first half of 2005. According to ISDA’s survey data, trading volume in credit derivatives more than doubled around this period, with the average number of trades conducted at large firms increasing from 644 trades a week in 2004 to 1,450 trades a week in 2005. According to data provided to regulators by 14 of the largest credit derivatives dealers—which include U.S. and foreign banks and securities broker-dealers—these dealers collectively executed around 130,000 trades in September 2005, and dealers’ backlogs of confirmations outstanding had risen to over 150,000 (table 2).<sup>16</sup> Of these, 63 percent had been outstanding for more than 30 days, and 41 percent had been outstanding for more than 90 days.

**Table 2: Number of Credit Derivatives Trade Confirmations Outstanding for 14 Major Dealers, September 2005**

	Number of confirmations outstanding	Percentage of the total confirmations outstanding
Confirmations outstanding 30 days or less	56,224	37%
Confirmations outstanding more than 30 days	97,650	63%
Confirmations outstanding more than 90 days	63,322	41% <sup>a</sup>
<b>Total confirmations outstanding</b>	<b>153,860</b>	<b>100%</b>

Source: GAO analysis of Markit Group data.

<sup>a</sup>The number of confirmations outstanding more than 90 days is included in the total of confirmations outstanding more than 30 days. As a result, the percentages do not add up to 100 percent.

<sup>16</sup>As identified in an attachment to the Federal Reserve Bank of New York’s September 15, 2005, press release, the 14 dealers are Bank of America; Barclays Capital; Bear, Stearns & Co.; Citigroup; Credit Suisse; Deutsche Bank; Goldman Sachs Group; HSBC; JP Morgan Chase; Lehman Brothers; Merrill Lynch & Co.; Morgan Stanley; UBS; and Wachovia Bank.

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## Two Factors Largely Caused the Confirmation Backlogs at Dealers

A major factor contributing to the backlogs was dealer and end-user reliance on largely manual processes for confirming credit derivative trades that could not keep up with the rapidly growing trade volume. Unlike highly automated processes for confirming trades in corporate stocks, the processes that dealers were generally using to confirm their credit derivative trades relied on inefficient manual procedures. For example, a dealer would manually prepare a confirmation and fax it to the counterparty; in turn, the counterparty would manually compare its trade record against the confirmation and, if the terms matched, fax the signed confirmation to the dealer. Such manual processes were resource intensive and generally lacked the scalability required to efficiently confirm the rapidly growing volume of trades.

Recognizing the need to improve the efficiency of the confirmation process for credit derivatives, dealers had been working with the Depository Trust and Clearing Corporation (DTCC) to increase the use of an automated confirmation system.<sup>17</sup> DTCC staff said that they started to work with several dealers in 2002 to create an automated system to electronically compare, match, and confirm credit derivative trades. The initial strategy was to have the system confirm only single-name credit default swaps and then to expand the system's capabilities to confirm other credit derivative products and provide other services. DTCC launched its automated system, Deriv/SERV, in late 2003, and 15 dealers and 7 end-users had signed up to use the system by around mid-2004. DTCC staff explained that obtaining wider use of Deriv/SERV took time, in part because of the need to publicize the system and because users needed to train their staff and revise their systems to use Deriv/SERV. According to staff at one hedge fund, many end-users did not initially use Deriv/SERV because they lacked the necessary technology. Consequently, up to 85 percent of the credit derivative trades were being confirmed manually during 2004, according to market participants. However, DTCC has expanded Deriv/SERV's capabilities to confirm a broader range of credit default swaps and as much as 46 percent of trades were being confirmed electronically by September 2005, according to data provided to regulators by 14 major dealers.

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<sup>17</sup>Through subsidiaries, DTCC provides clearance, settlement, and information services for equities, corporate and municipal bonds, government and mortgage-backed securities, and OTC credit derivatives.



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The second major factor contributing to the backlogs was the increasing incidence of end-users transferring their positions to other counterparties. Although the length of the contract for the most popular credit derivatives typically spans 5 years, some end-users, particularly hedge funds, engaged in frequent “in and out” trading of these products or had other incentives to liquidate their positions earlier. To do so, the end-users assigned their sides of trades to third parties. Although the agreements accompanying the trades did not permit assignments without the dealer’s prior consent, the dealers agreed to assignments after the fact because of competitive pressures and because the new counterparties (the assignees) tended to be other dealers. In effect, these assignments (also called novations) ultimately resulted in a new contract between the original dealer and the new counterparty, which would not be reflected on the dealer’s records until the original dealer accepted the assignment. A hedge fund official told us that when his firm wanted to terminate trades early, it initially returned to the original dealers, but the dealers charged termination fees that made this method more costly than assigning the trades.<sup>18</sup> Assignments have provided greater market liquidity and price discovery,<sup>19</sup> but according to dealers and regulators, they complicated the confirmation process. Without prior knowledge of an assignment, the original dealer could not readily confirm the details of the new trade until the dealer became aware of the assignment. Some end-users said that they obtained consent from the original dealers but that the dealers were not communicating the information internally to the appropriate staff for the purpose of confirming the trade.

Although assigned trades were a small share of total trading volumes, they represented a disproportionately large share of unconfirmed trades because of the time required to identify the correct counterparty. According to data provided by the 14 major dealers to regulators, trade assignments accounted for 13 percent of dealers’ trading volume in September 2005 but 40 percent of their total confirmations outstanding for more than 30 days at the end of September 2005. Dealers told us that they typically detected unilateral assignments through payment errors. For

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<sup>18</sup>To economically terminate a trade, an end-user could enter into an equal but opposite trade that offsets the original trade. This approach has the disadvantage of building up large netted positions between market participants. Hedge funds prefer to avoid this outcome because it creates additional operational costs.

<sup>19</sup>Liquidity is the extent to which market participants can buy and sell contracts in a timely manner without changing the market price, and price discovery is the process of determining price on the basis of supply and demand factors.

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example, a dealer would receive a premium payment from a party other than the party with which it had entered into the trade. Importantly, market participants had agreed to settle premium payments due under credit default swaps on a quarterly basis in order to provide greater market liquidity. Bank examiners told us that because of this settlement cycle, it could take a dealer as many as 90 days or more to detect a unilateral assignment through a payment error.

Dealers we spoke with identified several other factors that hampered their efforts to confirm trades in a timely manner. First, some dealers told us that as the volume of trading in credit derivatives grew, they faced challenges hiring experienced back-office staff and that training new staff took months. Second, other dealers said that the lack of standardized documentation, particularly for new products, led to disputes over the trade terms or the need to negotiate them, further delaying confirmation.<sup>20</sup> Compounding matters, there was a shortage of derivatives attorneys available for such negotiations, according to a bank examiner. Finally, two dealers said that the industry lacked standardized reference data to identify the specific entities referenced in credit derivative contracts. One of the dealers told us that the lack of such data led to mistakes in recording trades and hampered electronic confirmations. Mistakes in documenting the correct reference entity prompted a group of dealers to develop a database of reference entities and obligations in 2003 that has become an industry standard.

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### Confirmation Backlogs and Unilateral Assignments Increased Dealers' Operational Risks

Although dealers were capturing their credit derivatives trades in their risk management systems to manage the associated market and credit risks, the substantial backlog of unconfirmed trades heightened dealers' operational risk, potentially hampering their ability to effectively manage other risks. As with any trading activity, dealers engaging in credit derivative trades are exposed to market, credit, and other risks that they must adequately measure, monitor, and control. According to dealers and their regulators, the major credit derivatives dealers generally were entering their credit derivatives trades promptly into their trade capture systems and, in turn, measuring, monitoring, and managing the credit and

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<sup>20</sup>ISDA issued a standard confirmation form for credit derivatives in 1998, a set of definitions for credit derivatives in 1999, and a set of revised definitions in 2003 to reflect industry changes.

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market risks associated with those trades.<sup>21</sup> Dealers, for example, measure and manage market risk by estimating the potential losses that a portfolio of positions may suffer and then impose limits that restrict the estimated losses to an acceptable level. Similarly, dealers manage counterparty credit risk—which can produce losses if the dealers fail to receive payments owed to them—generally by measuring the total credit exposure to, and creditworthiness of, individual counterparties, and not allowing these exposures to exceed pre-established limits.

Although the credit and market risks were being managed, the large backlogs of unconfirmed trades increased dealers' operational risks. Confirmations serve as an internal control to verify that both parties agree to the trade terms and have accurately recorded the trade in their systems. For this reason, trades should be confirmed as soon as possible. Having unconfirmed trades could allow errors to go undetected that might subsequently lead to losses and other problems. Errors could be made at any time—for example, counterparties could miscommunicate when making a trade or dealers could enter the wrong trade data into their systems. If such errors go undetected, a dealer could make an incorrect premium payment to a counterparty or inaccurately measure and manage risk exposures, notably market and counterparty credit risks. Similarly, errors could lead to legal disputes between a dealer and a counterparty if a credit event triggered a contract settlement.

Further, these operational risks have the potential to contribute to broader market problems. For example, in its July 2005 report on strengthening the stability of the global financial system, the Counterparty Risk Management Policy Group II, composed of representatives of dealers and end-users, noted that as the number of outstanding credit derivatives trades continues to grow, a credit event involving a popular reference entity could materially strain the ability of market participants to settle transactions in a timely and efficient manner.<sup>22</sup> However, these operational risks did not result in such broader market problems, in part because of favorable market conditions when the confirmation backlog arose and because only seven referenced entities in the United States have defaulted

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<sup>21</sup>Dealers also told us that their trade capture systems automatically feed the data on credit derivatives trades to their accounting systems. Thus, the dealers captured their trades in their books and records, which are used to prepare their financial statements.

<sup>22</sup>See, Counterparty Risk Management Policy Group II, *Toward Greater Financial Stability: A Private Sector Perspective* (July 27, 2005).

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since 2005—with market participants able to effectively settle trades referencing these entities.

Although unconfirmed trade backlogs were growing, dealers had been taking steps to reduce the operational risks associated with these trades. To ensure that the trade data being captured and used to manage risks were accurate, dealers were informally contacting their counterparties before sending out confirmations to verify the key economic terms of the trades, but this practice varied among the nine dealers reviewed. Specifically, five dealers generally followed this practice for their credit derivative trades, according to their staff or examiners. In contrast, two dealers generally had been informally verifying trade terms for only those trades considered higher risk, according to their staff or examiners. Finally, staff at two other dealers said that they generally were not verifying trade terms before confirmation because their counterparties preferred not to do so.<sup>23</sup> The dealers also were monitoring their confirmation backlogs based on risk, such as by the number of days an unconfirmed trade was outstanding. Moreover, two dealers curtailed business with clients that had a large number of outstanding confirmations. In addition, the dealers had reviewed their confirmation processes and were improving them by, among other things, upgrading technology, reorganizing operations, and hiring staff. While dealers found some errors after confirming their trades, only two of the dealers interviewed told us that they had suffered a \$1-million-or-more loss as a result of an error stemming from their confirmation backlog but characterized the losses as immaterial.

Like unconfirmed trades, unilateral assignments increased operational, credit, and legal risks. First, unilateral assignments led to operational risk by creating new trades that were not being confirmed promptly to detect errors. Second, to effectively manage credit risk, dealers must know, at a minimum, the correct identities of the counterparties to their credit derivative contracts. Unconfirmed trades arising from unilateral assignments meant that dealers did not always know the exact counterparty to which they were exposed. As a result, their ability to accurately measure their credit exposure and enforce their pre-established limits on it was hampered. Moreover, because dealers did not always

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<sup>23</sup>In March 2006, the 14 dealers committed to verify the key economic terms of (1) standardized trades whose terms remained unmatched and thus unconfirmed for 5 or more business days after trade date and (2) nonstandardized trades within 3 business days after trade date.

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know the correct counterparties for each of their trades, they often made premium payments to, or received payments from, the wrong entity. Third, unconfirmed assigned trades also raised dealers' legal risk because of the potential for counterparties to later dispute the terms of the trade or the enforceability of the contract. For example, a court may deem an assigned trade as legally invalid if the original dealer did not provide its written consent. As the Counterparty Risk Management Policy Group II reported in 2005, some assignments occurred before the original trades were confirmed, increasing the risk of potential disputes over the status and the terms of the trade.

Several factors helped to mitigate the risks arising from unilateral assignments. According to dealers and regulators, the assignments did not increase market risk for dealers because dealers generally were capturing the key economic terms of the trades in their risk management systems accurately, and these terms remained the same when a trade was assigned. Further, although unilaterally assigned trades impaired the ability of dealers to measure and manage their counterparty credit risk, dealers and examiners told us that hedge funds and other end-users assigned nearly all of their trades to dealers, given their role as intermediaries to end-users. Because dealers were typically more creditworthy than the end-users assigning the trades, the original dealers ended up with more creditworthy counterparties after an assignment, according to dealers and examiners. Situations could arise, however, where this factor would not necessarily mitigate the original dealer's counterparty credit exposure.<sup>24</sup> In addition, dealers told us that they had collateral arrangements with their counterparties to manage their credit risk. For example, dealers required hedge funds to post a negotiated amount of initial collateral, such as cash or securities, for each trade they entered into with dealers.<sup>25</sup> As a risk management practice, two dealers told us that they would not release collateral to their counterparties until they verified that a trade was assigned. In addition, a provision of the standard contract that

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<sup>24</sup>The original dealer would not necessarily benefit from the trade being assigned to a more creditworthy dealer. As an example, if a hedge fund unilaterally assigned a contract to a new dealer to realize a gain from the contract, the new dealer would now be exposed to credit risk relative to the original dealer. However, the original dealer's credit risk exposure to the hedge fund could increase after the assignment if the trade had been offsetting other trades that the dealer had with the hedge fund.

<sup>25</sup>The dealers also required hedge funds and other counterparties to periodically post additional collateral to cover their credit risk exposure resulting from changes in the value of the contracts.

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counterparties enter into as part of conducting derivatives transactions—known as the ISDA Master Agreement—required counterparties to obtain the written consent of their counterparty before assigning a trade.<sup>26</sup> Some dealers told us that they could have relied on this provision, if needed, to reject a unilateral assignment. Finally, none of the dealers said that their counterparties tried to nullify an assigned trade.

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### Under the Direction of FRBNY as well as Other Regulators, Dealers and Others Have Worked Collaboratively to Considerably Reduce the Backlog and Address Its Causes

The unilateral assignments and the increasing backlogs raised regulatory concerns that prompted U.S. and foreign regulators and the major credit derivative dealers to seek a collective solution. FSA, which oversees financial activities in the United Kingdom, took one of the first actions to address the backlogs by sending dealers a letter in February 2005.<sup>27</sup> The letter expressed FSA's concern about dealers' level of unsigned confirmations and asked them to consider the robustness of their operational processes and risk management frameworks in the rapidly evolving credit derivatives market. U.S. regulatory staff told us that they had been aware of the backlogs since at least 2004 through their oversight activities and discussions with other regulators. For example, in 2004, U.S. bank examiners began to identify the growing backlogs of unconfirmed trades at dealers, including how unilateral assignments were contributing to such backlogs. Although they began monitoring dealers' efforts to resolve these issues, the regulators recognized in spring of 2005 that individual dealer efforts to address the practice of unilateral assignments were proving unsuccessful and that greater automation was needed. Regulatory staff told us that these unilateral assignments posed a

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<sup>26</sup>The ISDA Master Agreement sets forth standardized terms regulating general obligations of the parties, events of default, netting, early termination, transfer, currency provisions, and definitions. The Master Agreement and its related documentation are designed, among other things, to allow parties to establish under a single agreement all the “non-economic” terms—such as representations and warranties, events of default, and termination events—that will govern each individual derivative transaction between the parties. The specific “economic” terms of the individual derivatives contracts—such as the rate or price, notional amount, maturity, and collateral—are then negotiated and documented on a transaction-by-transaction basis. The Master Agreement contained a provision requiring the written consent of the other party prior to a party's assignment of its rights and obligations under the transaction to a third party. The Master Agreement, together with any amendments by the parties, is given effect in confirmations.

<sup>27</sup>Gay Huey Evans, Director, Markets Division, Capital Markets Sector Leader, Financial Services Authority, to Chief Executive Officers (regarding operations and risk management in the credit derivatives market), February 2005, <http://www.fsa.gov.uk/pages/library/communication/pr/2005/022.shtml> (accessed May 2007).

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“collective action” problem, in that dealers could not individually stop the practice for fear of losing business to other dealers that did not require counterparties to notify them prior to assigning a trade. According to regulatory staff, the prevalence of unilateral assignments was especially troubling because dealers did not always know the counterparties to their trades, raising questions about dealers’ ability to accurately manage the risks of these activities. In addition, regulatory staff said that the fact that dealers did not always know their counterparty’s identity raised operational concerns about the ability of market participants to settle trades, should a large reference entity default. Finally, regulators noted that resolving the causes of the backlogs required multilateral regulatory involvement, because no single regulator oversaw all the dealers.

To address these problems with confirmation backlogs and unilateral trade assignments, FRBNY convened a meeting in September 2005 with the 14 major credit derivative dealers and their regulators—referred to as the joint regulatory initiative. Regulatory representatives from around the world—including OCC, SEC, FSA, the German Financial Supervisory Authority, and the Swiss Federal Banking Commission—attended the meeting as supervisors of at least one of the major dealers involved in the initiative. At this meeting, the U.S. and foreign regulators discussed how the dealers would improve assignment practices and resolve the confirmation backlogs. In October, the dealers sent FRBNY a letter that outlined the steps to be taken to improve the credit derivatives industry’s practices and confirmation backlogs.<sup>28</sup> The plan included

- establishing target dates and levels by which to reduce the confirmation backlogs,
- increasing the use of electronic confirmations systems,
- supporting the implementation of a protocol to end unilateral assignments,

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<sup>28</sup>Senior management of Bank of America; Barclays Capital; Bear, Stearns & Co.; Citigroup; Credit Suisse First Boston; Deutsche Bank AG; Goldman, Sachs & Co.; HSBC Group; JP Morgan Chase; Lehman Brothers; Merrill Lynch & Co.; Morgan Stanley; UBS AG; and Wachovia Bank; letter to Mr. Timothy Geithner, President, Federal Reserve Bank of New York, October 4, 2005, <http://www.newyorkfed.org/newsevents/news/markets/2005/an051005.html> (accessed May 2007).

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- improving the process for settling credit derivatives contracts after a credit event, and
  - providing regulators with monthly data for measuring dealers' progress.

To enable the regulators to monitor the dealers' progress as part of the joint regulatory initiative, the 14 dealers agreed to collect data on their credit derivatives activities, including trading volume, unconfirmed trades, and trades confirmed using automated systems. Under the agreement, the dealers provide their individual data to Markit Group, a provider of independent data, portfolio valuations, and OTC derivatives trade processing. In turn, Markit Group aggregates the data across the dealers to protect the confidentiality of each dealer's data and then provides the regulators with aggregate data in a monthly report.

In February 2006, FRBNY hosted a follow-up meeting with the dealers and their regulators to discuss the progress and stated that it was encouraged by the progress that had been made. Following the meeting, the dealers sent FRBNY a letter committing to further improvements in market practices to "achieve a stronger steady state position for the industry."<sup>29</sup> Among the commitments the dealers made were (1) to ensure that all trades with standardized terms that were eligible for automated processing would be processed electronically, and (2) to work with DTCC to create a central depository to store electronically the details of all credit derivatives contract terms. In September 2006, FRBNY hosted a third follow-up meeting with the dealers and regulators to discuss the dealers' progress.

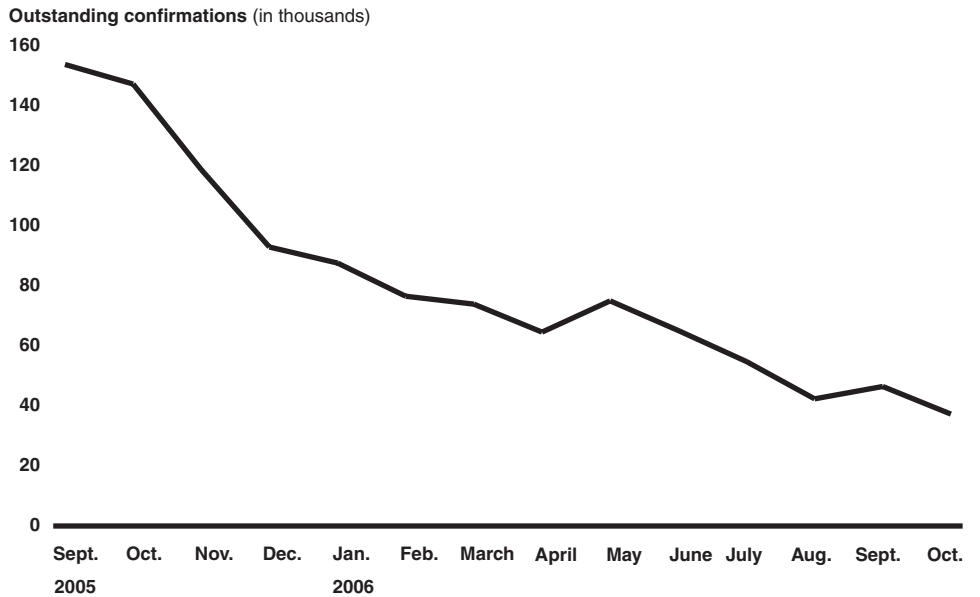
Since the initial meeting in September 2005, the 14 dealers have significantly reduced the number of outstanding confirmations. As shown in figure 3, the aggregated data that has been provided to regulators showed that the 14 dealers had reduced their total number of confirmations outstanding from 153,860 in September 2005 to 37,306, or by about 76 percent, by the end of October 2006.

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<sup>29</sup>Senior management of Bank of America; Barclays Capital; Bear, Stearns & Co.; Citigroup; Credit Suisse; Deutsche Bank AG; Goldman, Sachs & Co.; HSBC Group; JP Morgan Chase; Lehman Brothers; Merrill Lynch & Co.; Morgan Stanley; UBS AG; and Wachovia Bank; letter to Mr. Timothy Geithner, President, Federal Reserve Bank of New York, March 10, 2006, <http://www.newyorkfed.org/newsevents/news/markets/2006/an060313.html> (accessed May 2007).



**Figure 3: Total Outstanding Confirmations at 14 Major Dealers from September 2005 to October 2006**



Source: GAO analysis of Markit Group data.

Under the joint regulatory initiative organized by FRBNY, each dealer committed to incrementally reducing its number of confirmations outstanding more than 30 days by various amounts over the course of the following 9 months. The data that the dealers have been providing to regulators showed that they collectively exceeded each of the reduction goals they had agreed to meet and had reduced by 94 percent the total number of confirmations outstanding over 30 days from the September 2005 level to the October 2006 level (table 3). The dealers were able to achieve this reduction even though their monthly trading volume in credit derivatives generally increased during this period.

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**Table 3: Outstanding Confirmation Reduction Goals and Totals for the 14 Credit Derivatives Dealers**

<b>As of date</b>	<b>Outstanding confirmation reduction goal</b>	<b>Trades unconfirmed for more than 30 days</b>	<b>Percent reduction</b>
September 30, 2005		97,650	
January 31, 2006	30%	45,288	54%
April 30, 2006	50%	27,405	72%
June 30, 2006	70%	15,997	84%
October 31, 2006		5,558	94%

Source: GAO analysis of Markit Group data.

After October 2006, four additional foreign dealers have joined the original 14 dealers in providing monthly confirmation backlog and related data to Markit Group for aggregation and distribution to the regulators. As shown in table 4, with the inclusion of the additional dealer data, the total number of outstanding confirmations over 30 days has increased in comparison to the level at the end of October 2006, especially in March 2007. At the same time, table 4 shows that monthly trading volume has increased beginning in January 2007, and the number of confirmations outstanding more than 30 days as a share of the total number of outstanding confirmations has decreased slightly during this period. U.S. regulatory staff characterized the rise in the confirmation backlog as modest and attributed it generally to the increase in trading volume and noted that the automation of the confirmation process has helped dealers handle the increased volume.

**Table 4: Outstanding Confirmations and Related Data Provided by Dealers from October 2006 to March 2007**

<b>Time period</b>	<b>Number of dealers providing data</b>	<b>Total monthly trading volume</b>	<b>Total number of outstanding confirmations more than 30 days</b>	<b>Confirmations outstanding more than 30 days as a share of total outstanding confirmations</b>
October 2006	14	190,849	5,558	15%
November 2006	16	185,352	5,802	16%
December 2006	17	139,649	8,282	25%
January 2007	18	216,850	6,784	16%
February 2007	18	234,155	7,380	13%
March 2007	18	347,061	11,940	14%

Source: GAO analysis of Markit Group data.

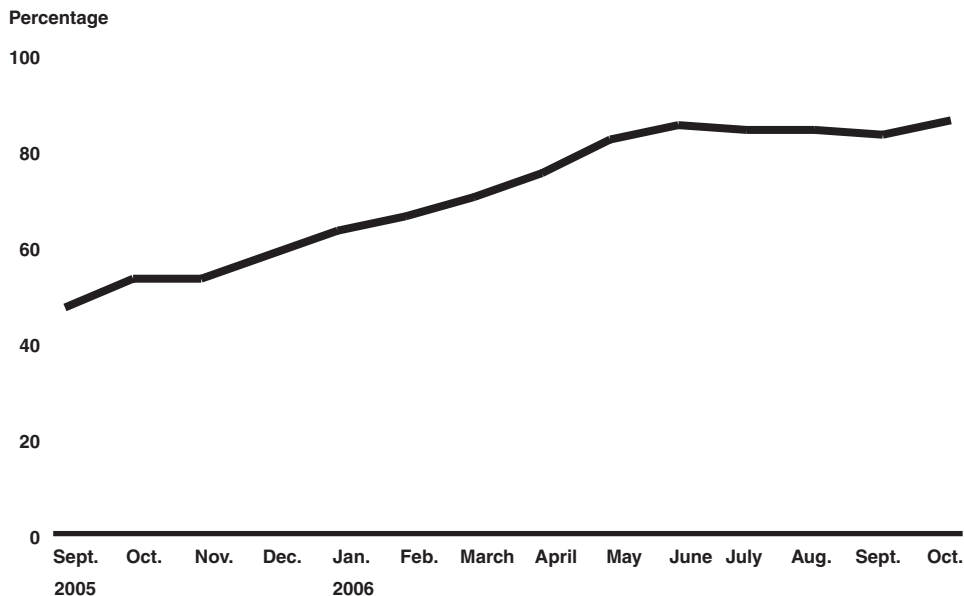
## Dealers Reduced Backlogs through Various Steps

To achieve these reductions in their unconfirmed trade backlogs, dealers took various steps. For example, dealers engaged in events called “lock ins” with other dealers and, to a lesser extent, end-users. Under a lock in, operations staff from either two dealers or staff from one dealer and one of their key end-user customers convened in a room and compared the trades they had conducted together until all or almost all were reconciled and confirmed. Dealers and end-users also used “tear-up services” to reduce the total number of open trades and thus eliminate the number of trades that needed to be confirmed. In a tear-up process, an automated system matches up offsetting positions across many market participants, allowing those trades to be, in effect, terminated and thereby removing the need to confirm such trades.

To prevent new trades from adding to the backlog, the dealers also increased their use of automated confirmation systems and set deadlines for confirming trades. First, as part of the joint regulatory initiative, the 14 major dealers committed to use DTCC’s automated system, Deriv/SERV, to confirm trades made with other dealers by the end of October 2005 and to require their active clients to use it or a comparable automated system,

such as SwapsWire, by mid-January 2006.<sup>30</sup> As shown in figure 4, the share of the total monthly trades confirmed electronically increased from 46 percent to 85 percent between the end of September 2005 and the end of October 2006.<sup>31</sup> Moreover, at the end of October 2006, the dealers collectively had 3,900 active clients—of which 98 percent, on average, were using an automated confirmation system or were in the process of subscribing to one.

**Figure 4: Share of Total Monthly Credit Derivatives Trades of the 14 Dealers Confirmed Electronically, September 2005 to October 2006**



Source: GAO analysis of Markit Group data.

Second, the 14 dealers committed to electronically confirming all trades that could be confirmed electronically (i.e., contracts with standardized terms) within 5 business days of the trade date, by the end of October 2006. Deriv/SERV has continually expanded its capabilities to

<sup>30</sup>The term “active client” was initially defined as a client that executed five or more Deriv/SERV-eligible trades a week, on average, for the past 3 months with an individual dealer. The standards were changed at the end of March 2006 to mean a client that executed one Deriv/SERV-eligible trade or more a week, on average, for the past 3 months with an individual dealer.

<sup>31</sup>At the end of March 2007, 86 percent of the total credit derivatives trades were confirmed electronically, based on data provided by 18 dealers to Markit Group.

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electronically confirm not only a wider range of products but also changes to existing contracts, including assignments. At the end of October 2006, about 90 percent of the total trades were eligible to be confirmed electronically, and about 94 percent of those eligible trades were electronically confirmed, according to the data provided by the 14 dealers. Of the trades confirmed electronically, 84 percent, on average, were confirmed within the stipulated 5 business days.<sup>32</sup> In addition, the industry has taken steps to help ensure that new products do not create backlogs. Officials at DTCC and ISDA said that they have formed industry working groups and revised certain procedures to reduce the time it takes to standardize the legal documentation for new credit derivatives, in turn enabling these products to be confirmed electronically by Deriv/SERV.

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### Market Participants Agreed to End Unilateral Assignments and Thereby Addressed a Key Factor Contributing to the Backlogs

An additional step taken to prevent further confirmation backlogs was to end the practice of unilateral assignments, which ISDA and market participants had been attempting to address since at least 2002. For example, ISDA published a novation agreement to document assignments in 2002, issued provisions governing credit derivatives assignments as part of its 2003 documentation standards for credit derivatives, and issued novation definitions and guidance on best practices for assignments in 2004. Despite such efforts, an ISDA working group found that market participants were using different practices to process assignments, increasing risks to counterparties and creating operational inefficiency and backlogs in processing trades.

ISDA officials told us that in early 2005 they had the working group start (1) to develop a protocol to streamline practices for dealers and end-users to follow to assign a trade and (2) to reach out to end-users as part of the effort. In the summer of 2005, the working group began circulating a draft protocol for comment. Shortly before the regulators initiated their joint action in September 2005, ISDA issued its voluntary Novation Protocol, and major dealers signed up for it. In their October 2005 letter to FRBNY, the dealers committed to finalizing a guide to support the protocol's implementation. By signing the protocol, a party seeking to assign a trade agrees to obtain the consent of its original counterparty through e-mail or

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<sup>32</sup>At the end of March 2007, about 92 percent of the total trades were eligible to be confirmed electronically, and about 93 percent of these eligible trades were confirmed electronically based on data provided by 18 dealers to Markit Group. Of the trades confirmed electronically, about 86 percent on average were confirmed within 5 business days after the trade date.

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other electronic means. Although the major dealers signed the protocol in September, some end-users were initially reluctant to sign, in part because they were concerned that dealers would not be able to consent to assignments promptly. In response, all the major dealers agreed to reply to assignment requests within 2 hours. By November 30, 2005, 2,000 market participants had signed the protocol.<sup>33</sup> Most of the major hedge funds have signed the protocol, according to officials from the Managed Funds Association, which represents the majority of the largest hedge funds.

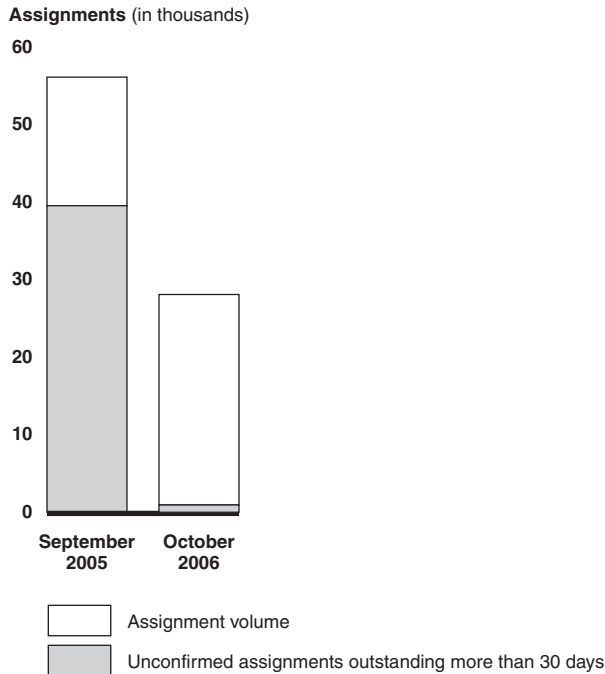
According to some dealers and U.S. financial regulators, the widespread adoption of the ISDA Novation Protocol has effectively ended the practice of unilateral assignments, eliminating a key factor that had contributed to the backlogs. Because the vast majority of assignments become dealer-to-dealer trades, the protocol enables dealers to monitor each other to ensure that clients are complying with it. If a dealer were to allow its client to assign a trade without obtaining the original dealer's consent, the original dealer would discover the compliance failure when it discovered the assignment. To facilitate the confirmation of assignments, Deriv/SERV also expanded its system in mid-2005 to electronically confirm assignments. As a result of the ISDA protocol and automation of the assignment process, the number of unconfirmed assigned trades outstanding for more than 30 days declined from around 39,500 at the end of September 2005 to around 940 at the end of October 2006 (fig. 5), even though the number of trades being assigned during this period generally increased.<sup>34</sup> From the end of September 2005 to the end of October 2006, the share of assignments confirmed electronically has increased from 24 percent to 82 percent.

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<sup>33</sup>ISDA subsequently issued the Novation Protocol II to allow new participants to the credit derivatives market to obtain the benefits of the original protocol. As of May 9, 2007, 268 market participants have adhered to the new protocol.

<sup>34</sup>After October 2006, Markit Group stopped providing data on outstanding confirmations for assigned trades.

**Figure 5: Total Monthly Volume of Assigned Trades and Number of Unconfirmed Assignments Outstanding for More Than 30 Days for 14 Major Dealers, September 2005 and October 2006**



Sources: GAO analysis of Markit Group data.

## Dealers Found Benefits in the Joint Regulatory Initiative

The dealers and other market participants we interviewed uniformly viewed the joint regulatory initiative as instrumental in reducing the backlog, automating the credit derivatives market’s infrastructure, and bringing the industry together to address the confirmation backlog problem. The market participants noted that regulatory support was crucial in encouraging cooperation among dealers and end-users to address problems related to the confirmation backlog. Specifically, they said that regulators’ involvement helped to persuade certain end-users to agree to adhere to ISDA’s Novation Protocol. In addition, they told us that the joint regulatory initiative catalyzed industry efforts to move to automated confirmation matching services such as DTCC’s Deriv/SERV—bringing about automation sooner than it otherwise would have occurred. Such intervention expedited the adoption of automated tools by end-users, enhancing dealers’ efforts to implement such tools as Deriv/SERV. Additionally, the joint initiative led to the formation of a group composed of dealers that meets weekly to discuss, among other things, operational

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issues. Two dealers told us that this group has helped to resolve problems in processing confirmations and also allowed the dealers to hear the views of end-users.

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### Dealers and Other Market Participants Continue to Work to Reduce Backlogs, Diminish Operational Risks, and Improve Market Infrastructure

While the dealers have made significant progress since 2005, they have continued their efforts to reduce backlogs and improve the infrastructure of the credit derivatives market. First, in addition to committing to confirm virtually all standardized trades electronically within 5 business days of the trade date, the dealers have committed to confirming all nonstandardized trades within 30 days after trade date. Because nonstandardized trades are complex and customized, such trades must be confirmed manually, according to ISDA officials. According to data provided by the dealers to regulators over the last 3 months, these trades have accounted for less than 10 percent of the total credit derivatives trading volume. According to regulators and dealers, these trades are generally complex and involve issues that require time to be legally negotiated before the trades can be confirmed. However, Federal Reserve and OCC staff have expressed concern that taking 30 days to confirm nonstandardized trades is too long and are continuing to work with dealers to reduce the confirmation time. The 14 dealers have made considerable progress in promptly confirming their nonstandardized trades, reducing the number of such trades remaining unconfirmed for more than 30 days from around 5,600 at the end of September 2005 to fewer than 440 by the end of October 2006. However, as the four additional dealers began providing their data after October 2006, the number of unconfirmed nonstandardized trades rose, reaching around 6,800 at the end of March 2007. To mitigate the risk of any unconfirmed nonstandardized trades, the dealers have committed to verifying the key economic terms of such trades informally within 3 business days of the trade date. As of the end of March 2007, dealers were meeting this commitment, on average, for around 54 percent of their nonstandardized trades.<sup>35</sup>

Second, under the joint regulatory initiative, the dealers have worked to reduce operational risks by committing to improvements in the settlement process for credit default swaps. For example, credit default swaps

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<sup>35</sup> Although 18 dealers provided data to Markit Group on the number of their nonstandardized trades not confirmed within 30 days, only 12 of these dealers provided data on the extent to which they were verifying the economic terms of such trades within 3 business days after the trade.



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generally require that the purchaser of credit protection under a credit default swap deliver the bonds (or loans) referenced in the contract to the counterparty if the bond issuer goes bankrupt. In exchange, the counterparty pays the par, or face, value of the bonds to the protection purchaser. This settlement method avoids difficulties that could arise when the bonds are valued after a bankruptcy.<sup>36</sup> However, situations can arise in which the amount of bonds needing to be delivered exceeds the amount of outstanding securities.<sup>37</sup> For example, when the auto parts maker Delphi filed for bankruptcy in 2005, credit derivatives on its bonds and loans totaled an estimated \$28 billion in notional amount, but Delphi had only \$5.2 billion in bonds and loans outstanding. In addition to increasing the difficulty of meeting the delivery obligation under a credit derivatives contract, a temporary shortage of bonds also could cause the price of the needed securities to increase immediately following a default. To facilitate settlement in this type of situation, ISDA has developed protocols to allow contracts to be settled in cash rather than by delivery of the debt. Under this process, the bond's price is established through an auction, and the counterparties providing credit risk protection pay their counterparties in cash based on the difference between the bond's auction price and par value. Since 2005, ISDA has used its protocols to facilitate cash settlement in seven credit events involving U.S. firms. The protocols covering the first six credit events enabled cash settlement of only credit default swap indexes. In its most recent form, the protocol permits cash settlement in index, single-name, and certain other credit derivatives. ISDA plans to include the cash settlement mechanism in its revised documentation standards for credit derivatives in 2007.

Finally, DTCC is working with dealers and end-users to implement a central trade depository to automate trade processes other than confirmation and thus reduce operational risks. Under the joint regulatory initiative, the dealers committed to work with DTCC to create (1) a

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<sup>36</sup>Since 1998, ISDA documentation for credit derivatives has provided counterparties with the option of settling their contracts in cash rather than by physical delivery. Under the cash-settlement option, price quotations are obtained for the referenced debt and used to determine the amount of the settlement payment. Most market participants have preferred the physical delivery option because of concerns about being able to obtain accurate quotations after a credit event.

<sup>37</sup>Because counterparties need not own the debt referenced in a credit derivative, they can enter into an essentially unlimited number of credit derivative contracts referencing such debt. In comparison, the amount of outstanding debt issued by a firm is fixed at any particular time.

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database to electronically store the official legal record of all credit derivative contracts eligible for automated confirmation, taking into account subsequent changes made to the contracts, such as assignments, and (2) a central infrastructure supporting the warehouse to standardize and automate post-trade processes over the life of each contract.<sup>38</sup> Specifically, the warehouse will support premium payment calculations and facilitate not only the bilateral payment settlement of electronically confirmed trades but also reconciliations for collateral management and credit event processing. DTCC launched the warehouse in November 2006, with all new trades electronically confirmed through Deriv/SERV automatically loaded into the warehouse. In addition, dealers are inputting their trade data for their existing credit derivatives contracts into the warehouse to create a complete database, and this effort is expected to continue through 2007. Two dealers told us that the trade input process is an extensive project, because around a million trades need to be inputted. DTCC also plans to expand the warehouse to support central payment calculation and settlement capability in 2007.

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## The Joint Regulatory Initiative Enhanced U.S. Regulators' Oversight of Dealers' Efforts to Reduce Their Backlogs

U.S. financial regulators were overseeing the operational and other risks at individual credit derivatives dealers through their continuous supervision and examinations. After the joint regulatory initiative, the industrywide data from the major dealers provided the regulators with more effective means of monitoring the resolution of the backlog and related problems.

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<sup>38</sup>The potential expansion to other OTC derivative products will depend on market demand and input from the senior group working with DTCC.

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## Federal Bank Regulators Were Monitoring Efforts Taken by Banks to Address Confirmation Backlogs through Continuous Supervision and Examinations

The Federal Reserve and OCC were aware of the confirmation backlogs at banks and were monitoring efforts to address them before the joint regulatory initiative. Of the 14 dealers participating in the joint regulatory initiative, nine are U.S. or foreign banks. Five of the banks are chartered as national banks and individually supervised and examined by OCC through its teams of examiners. Each of these banks is a subsidiary of a bank holding company or financial holding company supervised by the Federal Reserve.<sup>39</sup> OCC staff told us that the five U.S. banks conduct around 90 percent of their credit derivatives activities within the bank, not in their holding companies or other subsidiaries. As a result, OCC bank examiners are primarily responsible for overseeing the banks' credit derivatives activities but coordinate their oversight with their Federal Reserve counterparts. Federal Reserve officials told us that their examiners also oversee the U.S. operations of the foreign banks that are major dealers participating in the joint initiative.

At the four national banks and one foreign bank we reviewed, management had become aware of the confirmation processing and backlog problems at their own banks primarily through internal audit reports or management information reports tracking outstanding confirmations. The timeframes in which the problems surfaced at the banks and were brought to management's attention varied, with one bank's management learning about the problems in late 2003 and another bank's management not until the summer of 2005. Nonetheless, according to examiners of these banks, as bank management became aware of these problems, they provided these audit or management reports or had discussions with the bank examiners supervising their institutions. Bank examiners told us that they continually supervise how the banks are identifying, monitoring, and managing their operational, credit, market, and other risks posed by credit derivatives and other products through reviews of internal audit and management reports, meetings with key bank officials, and examinations.

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<sup>39</sup>The Bank Holding Company Act of 1956, as amended, generally requires that holding companies with bank subsidiaries register with the Federal Reserve as bank holding companies. Among other things, the act restricts the activities of the bank holding companies to those the Federal Reserve determined, as of November 11, 1999, to be closely related to banking. Under amendments to the act made by the Gramm-Leach-Bliley Act, a bank holding company can qualify as a financial holding company and may engage in a broad range of additional financial activities, such as securities and insurance underwriting.

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After learning of the backlog problems at the banks, the examiners said that they monitored each bank's efforts to address the processing problems and reduce the backlog, such as by periodically reviewing reports tracking the backlog, meeting with bank management and staff, or conducting examinations. Through their supervision, for example, the examiners reviewed the level of resources the banks were devoting to processing their credit derivatives trades. They also examined to varying degrees the credit derivatives confirmation process of four of the five banks between 2004 and 2006. For example, in 2004, examiners reviewed the progress that two banks were making in reducing their confirmation backlogs and in addressing the causes of the backlogs, including assignments of credit derivative trades. Based on examinations done in 2005, examiners directed two banks to develop plans to ensure that their infrastructures were capable of supporting the trading volume of credit derivatives, and the examiners said that the banks had developed such plans. In addition to focusing on the confirmation backlogs, examiners generally examined how well each of the five banks was managing its market, credit, and other risks associated with its credit derivatives activities. The examiners did not examine one bank's confirmation process because the bank was in the process of implementing a plan to address its backlog, but examiners monitored the bank's progress through informal reviews.

Bank regulators were also reviewing the banks' efforts to ensure the security and resiliency of their information technology systems. Managers at the four national banks we interviewed described taking various steps to ensure the security of their credit derivatives systems. For example, the systems used at these banks included restrictions on who could input or access data in the systems. Managers at these banks also were responsible for periodically reviewing and testing their staff's access rights to the systems to ensure that they were appropriate. According to bank staff, the security controls were reviewed or tested regularly by internal and external auditors—for example by conducting penetration tests in which auditors would attempt to obtain unauthorized access to the systems. In addition, the bank officials told us that they have taken steps to ensure the resiliency of their systems, including processing their credit derivatives in several different locations, creating off-site backup facilities, and developing disaster recovery plans. The examiners of these banks told us that they had tested or reviewed whether the banks were complying with controls designed to protect the security and resiliency of their information technology systems. For example, examiners told us that they reviewed managers' oversight of their staff's access rights to the systems and checked for testing of business continuity plans.

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## SEC Also Conducted Oversight of Credit Derivatives Confirmation Backlogs at Major Broker-Dealers

Unlike the bank regulators, SEC only recently began providing oversight of the credit derivatives activities of broker-dealers because such activities have generally been conducted in affiliates not subject to SEC regulation. According to SEC staff, the five U.S. broker-dealers that are active in the credit derivatives market generally book their trades in unregulated affiliates that are not subject to SEC supervision because they are not registered, nor required to be registered, with SEC.<sup>40</sup> However, in June 2004 SEC instituted its Consolidated Supervised Entity (CSE) program, under which large broker-dealers may qualify for alternative net capital rules in exchange for consenting to supervision on a consolidated basis by SEC.<sup>41</sup> The five U.S. broker-dealers engaged in credit derivatives trading applied for and were granted CSE status. Under the SEC's CSE program, SEC supervises the broker-dealers on a consolidated basis, with its prudential supervision extending beyond the broker-dealers to their unregulated affiliates and holding companies.<sup>42</sup> The five broker-dealers participating in the CSE program are also participating in the joint regulatory initiative.

Although aware that backlogs for OTC derivatives were an issue, SEC staff became aware of the extent of the credit derivatives backlogs at U.S. broker-dealers through continuous supervision and examinations conducted after these firms applied to the CSE program. SEC officials noted that although they were generally aware of the backlog in confirming credit derivatives through a study of the credit derivatives market conducted by the Joint Forum in 2004, they were surprised at the

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<sup>40</sup>Affiliates of broker-dealers that do not engage in the securities business within the United States are not required to register with SEC as broker-dealers.

<sup>41</sup>69 Fed. Reg., 34428 (June 21, 2004). The rule release states that the rule amendments respond, in part, to international developments. Affiliates of certain U.S. broker-dealers that conduct business in the European Union (EU) have stated that they must demonstrate that they are subject to consolidated supervision at the ultimate holding company level that is "equivalent" to EU consolidated supervision. SEC supervision incorporated into these rule amendments is intended to meet this standard.

<sup>42</sup>According to the SEC, under this program, SEC staff conduct various supervisory activities with respect to firms subject to the program, including reviewing monthly, quarterly, and annual filings; holding monthly meetings with senior management at the holding company; and conducting examinations of the holding company, the broker-dealer, and material affiliates not subject to supervision by a principal regulator.

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extent of the problem by the summer of 2005.<sup>43</sup> According to SEC staff, in 2005 risk managers and internal auditors at the CSE broker-dealers told SEC staff about the confirmations backlog and its potential impact on the credit derivatives market. Broker-dealer staff, during the summer of 2005, were periodically discussing with SEC the resources they were devoting to reducing their backlogs and the associated risks. For example, one firm devoted about 30 full-time staff and 20 consultants to reducing its backlog, according to SEC staff. Supplementing this information about the confirmations backlog, examinations conducted as part of the CSE application process also assisted SEC in learning more about the nature of the backlog and related concerns. As part of the application process, SEC examined the firms' internal risk management systems and controls, issuing examination reports from November 2004 through January 2006. SEC targeted credit derivatives products within the scope of all but one of its five application examinations, choosing products that posed the greatest risks and represented the highest volume in the firms.<sup>44</sup> Examination findings related to the credit derivatives confirmation backlog included delays in issuing confirmations promptly after the trade date and discrepancies between confirmation documentation and output data from systems used to input trades. Broader examination findings included concerns that internal audits at some firms did not always document processes or sufficiently follow up on recommendations and that some firms did not accurately compute counterparty credit ratings, in some cases for hedge fund counterparties. The findings were shared with

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<sup>43</sup>The Joint Forum—comprising a group of international bank, broker-dealer, and insurance company supervisors that includes SEC—issued a 2004 study of the credit derivatives market. The study reviews financial stability issues associated with credit derivatives and recommends, among other things, that confirmations be promptly executed after completing a transaction and that the industry issue clear guidance on the time required to issue and receive confirmations.

<sup>44</sup>According to an SEC examination official, credit derivatives were not covered for one firm for a number of reasons. First, the selection of products to review for this particular examination came before the widespread concern about the backlog in credit derivative confirmations was known. Second, other products were also high volume and high risk at the firm. Third, most of the credit derivative trades were booked in this firm's London subsidiary and therefore regulated by FSA. The goal of the examinations was to capture information about unregulated affiliates of the firm that had not previously been subject to review by any regulator.

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the firms, and SEC has monitored the firms' implementation of its recommendations.<sup>45</sup>

In addition to overseeing firms' credit derivatives backlogs, SEC staff told us that their CSE broker-dealer examinations conducted at the time of application also addressed the security and resiliency of these firms' information technology systems, including those that are used for credit derivatives activities. For example, at the broker-dealers, SEC staff reviewed reports by firms' internal audit departments on security and resiliency of information technology systems in general, as some of these systems handled credit derivatives transactions. In addition, SEC examinations included business continuity planning reviews based on draft interagency standards on protecting the resiliency of the U.S. financial system.

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### Through the Joint Regulatory Initiative, Regulators Are Obtaining Data to More Effectively Track Industrywide Progress on Reducing Confirmation Backlogs

Although both U.S. banking and securities regulators were individually overseeing aspects of U.S. dealers' credit derivatives activities, the joint regulatory initiative provided U.S. and foreign regulators with information that enabled them to better oversee the progress being made by the major dealers to address the backlog issue. While the individual regulators had data on the backlogs at the dealers under their supervision, no one regulator supervised all 14 major dealers and thus had data on the size of the problem across all dealers. Under the joint regulatory initiative, U.S. financial regulatory staff said that they told the 14 dealers what information they needed in order to track dealers' progress in addressing the backlog and related problems. Based on the capabilities of their management information systems, the dealers collectively developed a template to collect standardized metrics. The data include information on trading volume, trade assignments, trades confirmed electronically and manually, and confirmations outstanding based on length of time the trades remained unconfirmed. Under the arrangement, each dealer provides the standardized data to its primary regulator at the end of the month. For example, the U.S. broker-dealers provide their data to SEC, and the national banks provide their data to OCC. In addition, each dealer provides its data to Markit Group, which aggregates the data across all the dealers to preserve the confidentiality of each dealer's data and computes

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<sup>45</sup>While the SEC examinations did not initially focus on the confirmation backlog specifically, this was included as part of the examination process when SEC became aware that the backlog in credit derivatives was an industrywide concern.

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averages for the metrics, such as the average number of outstanding confirmations for the dealers. In turn, Markit Group provides the U.S. and foreign regulators and dealers participating in the joint regulatory initiative with a set of the aggregate data.

According to U.S. and foreign financial regulators, the aggregate and individual dealer data have provided regulators with an effective tool for tracking overall and individual dealer progress. According to U.S. regulators, using a template to standardize data collection has helped to ensure the comparability of the data across the dealers. The regulators also told us that the data are critical to the joint regulatory initiative, because the combined data provide transparency, enabling the regulators to track the progress of individual dealers under their supervision and helping each dealer to see how well it is doing relative to the average. Similarly, FSA officials told us that the aggregate data has provided regulators with a simple way to monitor the backlog level for the entire market and to compare individual dealers' backlog levels against the average. The officials also said that the common set of measures has helped to instill discipline among the dealers.

Under the joint regulatory initiative organized by FRBNY, the U.S. and foreign regulators are continuing to monitor the credit derivatives market and have expanded their efforts in September 2006 to address confirmation backlogs in the market for OTC derivatives based on equities.<sup>46</sup> According to dealers, it takes longer to confirm an OTC equity derivative trade than any other type of OTC derivative trade, because such trades are processed largely through manual rather than automated means because of the lack of standardized trade documentation. Based on data provided by the major dealers to the regulators, they had over 81,000 unconfirmed trades at the end of November 2006, with around 31,000, or 54 percent, of these trades remaining unconfirmed for over 30 days. In a November 2006 letter to FRBNY, 17 dealers committed to working with industry organizations to improve the efficiency of the equity derivatives

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<sup>46</sup>OTC equity derivatives are financial contracts whose value is derived from an underlying equity or equity index. For example, an equity or equity index swap is a transaction in which one party pays periodic amounts based on a fixed price or rate and the other party pays periodic amounts based on the performance of an individual equity or equity index, such as the Standard and Poor's 500 Index.



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market, in part through the greater adoption of automation.<sup>47</sup> Among other things, the dealers committed (1) to reduce by 25 percent the number of unconfirmed trades outstanding more than 30 days by the end of January 2007 based on dealers' highest level of outstanding confirmations from July to September 2006 and (2) to use at least one industry-accepted electronic confirmation service and one other such platform by the end of March 2007. U.S. regulatory staff told us that dealers met the first goal but that, as of April 2007, one dealer had not yet fully met the second goal. At the end of March 2007, the number of unconfirmed equity derivative trades outstanding more than 30 days rose to around 43,000 trades. U.S. regulatory staff said that the increase generally resulted from the inability of the manual processes used by dealers and end-users to confirm trades to keep pace with the increase in trading volume. The dealers also agreed to continue to provide the U.S. and foreign regulators with standardized data not only on credit derivatives but also on OTC equities, interest rate, foreign exchange, and commodity derivatives.<sup>48</sup> U.S. regulators said that they wanted to track data across the major OTC derivatives products to ensure that work done in connection with equity derivatives does not hamper the ability of the dealers to process their other OTC derivative trades in a timely manner. Such data will assist regulators in monitoring the operational and other risks raised by OTC derivative products.

Given that individual efforts could not fully resolve the backlog problem, U.S. and foreign regulators we interviewed said that the joint regulatory initiative proved instrumental in ensuring that the problem was addressed. According to representatives of FSA, bringing together the various financial regulators from throughout the world was an approach that worked very well to ensure collaboration among regulatory bodies. Similarly, U.S. bank examiners told us that the joint regulatory initiative

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<sup>47</sup>As identified in an attachment to the Federal Reserve Bank of New York's November 21, 2006, press release, the 17 dealers are Bank of America, N.A.; Barclays Capital; Bear, Stearns & Co.; BNP Paribas; Citigroup; Credit Suisse; Deutsche Bank AG; Dresdner Kleinwort; Goldman, Sachs & Co.; HSBC Group; JP Morgan Chase; Lehman Brothers; Merrill Lynch & Co.; Morgan Stanley; Société Générale; UBS AG; and Wachovia Bank, N.A.

<sup>48</sup>The dealers are providing standardized data on their OTC credit, equity, and interest rate derivative trades to regulators through Markit Group. A foreign exchange committee sponsored by the Federal Reserve Bank of New York is separately monitoring the foreign exchange derivatives market. Interest rate, foreign exchange, and commodity derivatives are financial contracts whose value is respectively derived from an underlying (1) interest rate, such as the London Interbank Offered Rate (the interest rate paid on interbank deposits in the international money markets); (2) currencies, such as the U.S. dollar and Canadian dollar; and (3) commodities, such as natural gas or gold.

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served an important role in getting the dealers to work collectively and by providing a level regulatory playing field. U.S. and foreign regulators and dealers are already applying this model to address similar issues in the OTC equity derivatives market.

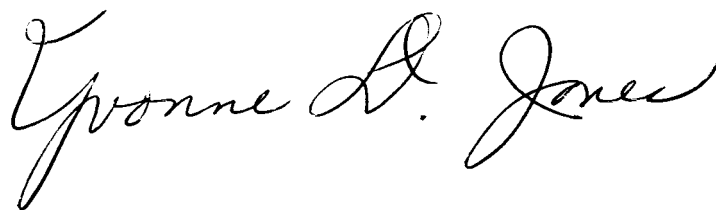
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## Agency Comments

We provided a draft of this report to the Federal Reserve, OCC, and SEC for their review and comment. The Federal Reserve and SEC provided technical comments, which we incorporated as appropriate.

As agreed with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this report. At that time, we will send copies of this report to other interested congressional committees and the Chairman, Federal Reserve; the Comptroller of the Currency; and the Chairman, SEC. We will also make copies available to others upon request. The report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions regarding this report, please contact me at (202) 512-6878 or [jonesy@gao.gov](mailto:jonesy@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix II.



Yvonne Jones  
Director, Financial Markets and Community Investment

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*Congressional Requesters*

The Honorable John D. Dingell, Chairman  
The Honorable Joe Barton, Ranking Member  
Committee on Energy and Commerce  
House of Representatives

The Honorable Edward J. Markey, Chairman  
The Honorable Fred Upton, Ranking Member  
Subcommittee on Telecommunications and the Internet  
Committee on Energy and Commerce  
House of Representatives

The Honorable Bobby L. Rush, Chairman  
The Honorable Cliff Stearns, Ranking Member  
Subcommittee on Commerce, Trade, and Consumer Protection  
Committee on Energy and Commerce  
House of Representatives

The Honorable Jan Schakowsky  
House of Representatives

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# Appendix I: Scope and Methodology

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To identify what caused the credit derivatives dealers' trade confirmation backlogs and how the backlogs are being addressed, we analyzed credit derivatives trading volume, confirmation backlog, and other transaction data provided by the major dealers to Markit Group, a provider of independent data, portfolio valuations, and over-the-counter derivatives trade processing. We also analyzed operations and other data that dealers provided to the International Swaps and Derivatives Association (ISDA), a global over-the-counter derivatives trade association. We conducted data reliability assessments for the Markit Group and ISDA data and determined that the data were sufficiently reliable for our purposes. We also reviewed reports and relevant publications from industry associations, industry working groups, international organizations, companies, and academics on the credit derivatives market. Of the 14 dealers participating in the joint regulatory initiative, we interviewed operations and other staff from three U.S. banks, one foreign bank, and four U.S. securities broker-dealers.<sup>1</sup> We selected these dealers to ensure that we included a range of characteristics, based on type of regulator (bank or broker-dealer), trading volume (high or low), and headquarters location (United States or foreign). We also interviewed staff from the Federal Reserve, including its examiners for two banks; the Office of the Comptroller of the Currency (OCC), including its examiners for three banks; the Securities and Exchange Commission (SEC); and the U.K.'s Financial Services Authority (FSA). We reviewed examinations conducted between 2004 and 2006 and other supervisory materials covering the eight dealers we interviewed and two other dealers that also participated in the joint regulatory initiative. In addition, we interviewed representatives from industry associations, including ISDA, the Managed Funds Association (representing hedge funds) and the Securities Industry and Financial Markets Association (representing securities firms, banks, and asset managers).<sup>2</sup> Finally, we interviewed officials from the Depository Trust and Clearing Corporation about its automated services for processing credit derivative trades and an official from a hedge fund.

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<sup>1</sup>As identified in an attachment to the Federal Reserve Bank of New York's September 15, 2005, press release, the 14 dealers are Bank of America; Barclays Capital; Bear, Stearns & Co.; Citigroup; Credit Suisse First Boston; Deutsche Bank; Goldman Sachs Group; HSBC; JP Morgan Chase; Lehman Brothers; Merrill Lynch & Co.; Morgan Stanley; UBS; and Wachovia Bank.

<sup>2</sup>The Securities Industry and Financial Markets Association is the result of a merger between the Securities Industry Association and the Bond Market Association.

To determine how U.S. financial regulators were overseeing the dealers' operational risk, including related information technology systems associated with credit derivatives activities, we reviewed examination manuals and other supervisory or regulatory guidance prepared by the Federal Reserve, the OCC, and the SEC. We also reviewed and analyzed supervisory strategies prepared and examinations conducted between 2004 and 2006 by the Federal Reserve and the OCC on the credit derivatives activities of five banks participating in the joint regulatory initiative. In addition, we reviewed and analyzed examinations conducted between 2004 and 2006 by SEC covering the holding companies of the five securities broker-dealers participating in the joint regulatory initiative. Also, we interviewed staff at the Federal Reserve, OCC, and SEC participating in the joint regulatory initiative. We also interviewed Federal Reserve or OCC examiners assigned to supervise and examine five of the banks participating in the joint regulatory initiative and SEC staff who examined the holding companies of the five securities broker-dealers participating in the joint regulatory initiative. Finally, we interviewed FSA officials to understand their efforts in identifying the confirmation backlogs and in participating in the joint regulatory initiative.

We conducted our work in Charlotte, North Carolina; Chicago; New York; and Washington, D.C., from August 2006 to March 2007 in accordance with generally accepted government auditing standards.

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# Appendix II: GAO Contact and Staff Acknowledgments

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## GAO Contact

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## Staff Acknowledgments

In addition to the contact named above, Cody Goebel, Assistant Director; Robert Lee; Paul Thompson; Marc Molino; Emily Chalmers; and Richard Tsuhara made key contributions to this report.

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