OTC Derivatives and Central Clearing: Can All Transactions Be Cleared?

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Abstract

The 2007-2009 financial crisis has led legislators on both sides of the Atlantic to propose laws that would require most "standardized" over-the-counter (OTC) derivatives to be cleared centrally. This paper examines these proposals. Although OTC derivatives did not cause the crisis, they do facilitate large speculative transactions and have the potential to create systemic risk. The main attraction of the central clearing proposals is that they will make positions in standardized derivatives more transparent. However, our experience from the 2007-2009 crisis suggests that large losses by financial institutions often arise from their positions in non-standard OTC derivatives. The paper argues that one way forward is for regulators is to require all OTC derivatives (standard and non-standard) to be cleared centrally within three years. This would maximize the benefits of netting and reduce systemic risk while making it easier for regulators to carry out stress tests. The paper divides OTC derivatives into four categories and suggests how each category could be handled for clearing purposes.

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When assessed in terms of its growth over the last 30 years, the OTC derivatives market has been very successful. The total principal underlying outstanding derivatives transactions in the OTC market is currently about ten times that for the exchange-traded market. Unlike the exchange-traded market, the OTC market is largely unregulated. This is likely to change soon. The huge derivatives losses experienced by financial institutions during the 2007-2009 financial crisis is leading governments on both sides of the Atlantic to propose legislation requiring that some OTC derivatives transactions move to central clearinghouses.

Once it has been negotiated between two parties, A and B, an OTC derivatives transaction can be cleared by being presented to a central clearing counterparty (CCP). Assuming the CCP accepts the transaction, it becomes the counterparty to both A and B. Each of A and B are able to net the transaction with other transactions they have entered into with other counterparties, providing those transactions are also being cleared through the CCP. The CCP takes on the credit risk of both A and B. It manages this risk by requiring an initial margin and calculating daily variation margins. It therefore operates in much the same way as a clearinghouse does for exchange-traded products such as futures.

It is anticipated that the legislation will, with some exceptions, require "standardized" derivatives to be cleared. There are a number of outstanding issues. Who will determine what is and is not a standardized transaction? (It could be either regulators or the CCPs themselves.) Will transactions involving industrial end-users be exempt from the CCP requirement? (The European Union appears to favor this.) Will foreign currency contracts be exempt? (At one stage, the U.S. Congress favored this.) What assets will be acceptable to meet margin requirements? (Obviously cash will be acceptable for both the initial margin and variation margins. Marketable securities are usually acceptable in bilateral OTC collateralization agreements, but, given the complexity of the multilateral transfers that have to be made each day, they might not be an acceptable form of variation margin to a CCP.)

Although the use of CCPs is not yet a legal requirement for any OTC derivatives, some credit default swaps and interest rate swaps are currently being cleared through CCPs such as ICE Trust and LCH.Clearnet. Given the global nature of derivatives markets, it is obviously

important that the laws enacted by different governments are similar. Once these laws are in place, the amount of business channeled through CCPs is likely to increase rapidly. Almost certainly, the Basel Committee will impose much higher capital requirements for transactions that are cleared bilaterally than for those cleared through CCPs. This will reduce any incentive derivatives dealers may have to make their contracts "slightly nonstandard" in order to avoid central clearing requirements.

Channeling OTC derivatives transactions through CCPs has two main objectives. The first is to reduce counterparty credit risk. A second is to increase transparency so that regulators are more easily able to quantify the positions being taken and carry out stress tests. This paper argues that it is important to ensure that all OTC derivatives are covered by the new rules. Credit derivatives were most prominent during the last crisis and have received most attention from regulators, but unless there is careful monitoring it is quite possible that in the future big destabilizing positions will be taken in other derivatives, perhaps ones that have not yet even been invented. Acharya et al (2009) argue that central clearing should be used for actively traded OTC derivatives while others are monitored using a central registry. This paper argues that it is simpler, and also feasible, to require all derivatives to be cleared centrally and to do so in a way that makes it relatively easy for regulators to monitor exposures and carry out stress tests. The paper divides derivatives into four categories and discusses how each category can be handled.

1. Background

OTC derivatives markets were developed to allow end users to manage their exposures more efficiently than is possible with exchange-traded markets. The advantage of the OTC market is that a transaction can be tailored to meet the precise needs of an end user. For example, when a fund manager owns a portfolio of Japanese stocks, but thinks that US equities have better prospects over the next six months, a total return swap can be a useful tool; when a company has exposures to five different exchange-rates, a basket option can be an attractive hedge.

The end-users of OTC derivatives have made it clear to legislators that they are happy with current arrangements. They do not want to be forced to post margin as this could lead to liquidity problems. Also, they do not want derivatives contracts to become standardized because this would make them less useful for hedging and might result in them not qualifying for hedge

accounting. (In fact, it is unlikely that nonstandard derivatives will be banned. If they are not cleared, the regulatory capital requirements for nonstandard transactions will probably increase and as a result end users might get slightly less attractive terms. But even this might not happen as the economic capital required for the transactions should not change.)

Of course not all OTC derivatives transactions can be classified as "socially useful." Some involve regulatory arbitrage (i.e., reducing the regulatory capital a bank has to keep without reducing its exposures); some are concerned with changing the tax or accounting treatment of an item; occasionally an OTC derivative is designed by a dealer to appear more attractive than it is to unwary end users.[1]

No doubt, regulators and politicians would love to keep the socially useful applications of OTC derivatives and outlaw the others. This is unlikely to be possible. In this section, we examine some of the objectives that might be achieved by regulating OTC derivatives.

1.1 OTC Derivatives and the Crisis

The first point to make is that OTC derivatives did not cause the 2007-2009 financial crisis (or previous financial crises). The causes of the crisis are complex and it would be a mistake to imagine that regulating OTC markets will somehow automatically prevent similar crises in the future. The crisis was caused by a mixture of macroeconomic events, government policies, the relaxation of lending standards by financial institutions, and the failure of regulation.[2] If OTC derivatives markets did not exist, a severe world recession would still have occurred.

The crisis that unfolded was a result of low interest rates and a relaxation of lending standards by banks operating in the US residential mortgage market. The story is now familiar to most people. The relaxation of mortgage lending standards increased the demand for residential real estate, pushing up prices very fast during the 2000 to 2006 period. When some borrowers found that they could not service their loans there were foreclosures. This increased the supply of real estate

[1] Some people would include speculation in this list of non-socially-useful applications of OTC derivatives and some large synthetic transactions involving the subprime mortgage market have been widely criticized as having no redeeming qualities. However, speculators are an important source of liquidity in many derivatives markets.
[2] For example, Jagannathan et al (2009) argue that the fundamental cause of the crisis was a labor shock where large numbers of workers in developing countries found that they could compete with Western workers without relocating. Obstfeld and Rogoff (2009) similarly contend that increasing global trade imbalances were an important contributory factor.

and reversed the price increases. A positive feedback loop developed where price declines led to more foreclosures which in turn led to more price declines. OTC derivatives moved the default losses from one entity to another in the economy (sometimes in a fairly dramatic way), but they did not create the losses.

Why did US banks relax their lending standards? Some people have argued that this would not have happened without the development of an OTC market for securitizing and resecuritizing subprime mortgages. However, this is at most a small part of the story. Many of the tranches formed from subprime mortgages found their way back on to the books of banks. It seems unlikely that banks would knowingly make large numbers of bad loans, securitize them, and then buy the securitized products.[3]

1.2 OTC Derivatives and Systemic Risk

Most large financial institutions have huge portfolios of derivatives and that their counterparties in many of their OTC derivatives transactions are other large financial institutions. This is not because large financial institutions are using the markets for nothing more than betting with each other on the future direction of market variables. When a derivatives dealer enters into a transaction with an end user it typically lays off its risk by entering into transactions with other dealers. This is what accounts for the vast majority of inter-dealer trades.

The OTC derivatives market is a potential source of systemic risk because a default by one large financial institution can lead to losses by other large financial institutions and defaults by these financial institutions. This in turn can lead to yet more losses by other financial institutions and a disaster for the financial system. Regulators are quite rightly concerned about this scenario. They have shown at the time of the Long Term Capital Markets failure in 1998 and at several times during the 2007-2009 crisis that they are prepared to take swift action to avoid any possibility of it happening.

[3] The main motivation for banks to securitize mortgage assets and then buy the securitized products was a reduction in regulatory capital.

Perhaps fortunately, we have never allowed a situation to develop where the extent of the systemic risk losses created by OTC derivatives can be observed and measured. It is reassuring that the financial system has survived defaults such as Drexel and Lehman without serious problems. It should be emphasized that financial institutions do not ignore systemic risk. They devote huge resources to managing counterparty risk, particularly that resulting from their derivatives transactions with other large financial institutions.[4] Bilateral netting and collateralization agreements, although not legal requirements, have become the norm for these transactions and have led to a huge reduction in systemic risk. Table 1 shows that netting reduced the aggregate derivatives exposures of dealers from $25.4 trillion to $3.7 trillion in June 2009. Much of the $3.7 trillion is collateralized, reducing counterparty risk much further.
One of the reasons CCPs are attractive to politicians and regulators is that they have the potential to increase the benefits of netting and collateralization with the result that counterparty risk is reduced still further and there is less chance of systemic risk leading to a failure of the financial system. As will be discussed later, they also have the potential to make OTC derivatives more transparent and easier to regulate.

1.3 OTC Derivatives and Speculation

OTC derivatives make it easier for financial institutions to take huge risks. Many financial institutions such as Bear Stearns, Merrill Lynch, Citigroup, and AIG Financial Products appear to have succumbed to the temptation of doing this in the first decade of the 21st century. The AIG situation was particularly extreme. The company sold credit default swap (CDS) protection against losses on the securitized products created from subprime mortgages. When the company was downgraded below AA, it was required to post a huge amount of collateral with its counterparties and was unable to do so. The US government provided an $85 billion injection of funds to avoid a default.

Would the type of central-clearing legislation currently being proposed have prevented the AIG fiasco? The answer is that it probably would not have done so. The legislation requires standardized CDS transactions to be cleared. It is likely that in, say, 2006 the list of standardized

[4] See for example Gregory (2010) and Hull (2010)

derivatives for which clearing is required would have included single-name CDSs that provide protection against defaults by corporate or sovereign entities. It would also have included transactions that provide protection against losses on standardized portfolios such as iTraxx Europe and CDX NA IG. However, the AIG transactions were nonstandard. They related to losses on tranches created from particular mortgage portfolios (and from tranches created from those tranches). It is unlikely that the type of legislation now being proposed, if enacted five years ago, would have covered them.

Casual empiricism suggests that when large speculative positions are taken by financial institutions, they are usually in non-standard OTC derivatives.[5] Regulators should therefore give more attention to these instruments. Later this paper argues that using CCPs for all OTC derivatives is not an unreasonable goal. But, at minimum the new regulatory regime for OTC derivatives should require non-standard OTC derivatives between systemically important financial institutions to be subject to two-way collateralization agreements with no threshold.[6] Downgrade triggers such as those that were used by AIG's counterparties should not be permitted as they tend to exacerbate systemic risk.

An important point here is that, all too often, the collateralization of non-standard OTC derivatives is hampered by arguments over their market value. When A demands that collateral be posted by B because the net value of outstanding transactions between them has moved in A's favor, B may dispute the valuation and it may take some time to resolve the issue. If bilateral agreements do remain a feature of the OTC derivatives market, a compulsory feature of such agreements (at least when a systemically important financial institution is on one side) should be that for each transaction either a) a third party is designated to calculate the daily market value or b) the procedure for calculating the daily market value is specified in the credit support annex.

[5] There are exceptions. Some of the large losses that have been reported (or example, Allied Irish Bank's loss in 2002) were caused by traders finding ways of hiding the exposures created by standard OTC transactions. But in general exposures created by standard OTC derivatives are well understood and therefore less likely to be tolerated.
[6] This means that each party has to post with the other collateral equal to the greater of the net value of outstanding transactions to the other party and zero.

1.4 OTC Derivatives and Transparency

One advantage often cited for CCPs is that they will bring extra transparency to the OTC market. There two aspects to transparency. One is concerned with knowing the market prices of instruments traded in the OTC market; the other is concerned with knowing the positions taken by the financial institutions trading in the market

The term "dark markets" has been used to describe OTC markets. This is perhaps a little extreme. It is notable that market participants such as dealers, fund managers and corporate treasurers do not seem to the ones complaining about price transparency. On-line services such as Bloomberg and Reuters disseminate dealer prices to the market. It is true that the quote given by a dealer for a plain-vanilla OTC derivative may depend to a small extent on the size of the trade, the dealer's inventory, the extent to which the dealer is capital constrained, the credit quality of the counterparty, and other transactions that are outstanding with the counterparty. This is hardly surprising. It should not be taken as evidence that dealers are purposely concealing key information from their clients. Highly structured transactions such as synthetic CDOs may see a bigger price variation from one dealer to another, but this is also as one would expect and not something that regulators should be concerned about.

Knowing the transactions undertaken by financial institutions is important to regulators so that they are aware of large speculative positions and can monitor systemic risk.[7] The challenge is to arrange for positions to be reported and aggregated so that the results are useful to regulators. CCPs have a role to play here as we discuss later. It is clearly important for regulators to determine the daily changes in the values of non-standard transactions as well as standardized transaction because, as already pointed out, when large speculative positions are taken, they tend to be in non-standard transactions.

[7] It is not so clear that others need this information. If it is considered to be in the public interest to give the information to non-regulators, the information should be non-current at the time it is made available. Divulging the current positions of a financial institution to competitors would not be a sensible move. If potential counterparties know the hedging trades the financial institution needs to do, the financial institution is less likely to get competitive quotes.

2. The Advantages of Central Clearing

Duffie and Zhu (2009) make the important point that central clearing does not necessarily improve netting efficiency. The efficiency of central clearing depends on the number of CCPs and the proportion of all OTC derivatives that are cleared. Central clearing always improves netting efficiency when a single CCP is used for all OTC derivatives. If the current legislation leads to, say, 60% of all OTC trades being cleared through 10 different CCPs it is not necessarily the case that the $3,744 billion figure in Table 1 will be improved upon. Indeed it might get worse.

A simple example will show why this is. We suppose that there are three derivatives dealers (A, B, and C) and two categories of products, only one of which is cleared. (The cleared product category could be all standardized OTC derivatives and the non-cleared category all non-standard OTC derivatives.) The mark-to-market value of the dealers' positions is indicated by the arrows in the left part of Figure 1, which assumes that all transactions are cleared bilaterally. For example, Dealer A's transactions with Dealer B are worth −100 to Dealer A in the non-cleared product type and +50 to Dealer A in the cleared product type. With bilateral clearing the net exposures of A, B, and C are 0, 100, and 20, respectively. The right part of Figure 1 shows how this situation changes when a CCP is used for the cleared category. The net exposures of A, B, and C, including exposures to the CCP, are now much higher at 120, 120, and 90, respectively. Even when exposures to the CCP are not included, the average of the three exposures is 75% higher than without the CCP.

Extrapolating from this example, netting efficiency increases as the percentage of OTC trades that are cleared increases. With multiple CCPs, the netting efficiency may decline. However, there is likely to be some consolidation of CCPs over time. Also, netting agreements between CCPs should develop. For example, if a dealer receives 15 from one CCP in a day and must pay 25 to another CCP, there could be an agreement whereby the dealer has to pay 10 to the second CCP. The remaining 15 would be automatically transferred from the first CCP.[8]

[8]Given that the assets used to satisfy CCP variation margin requirements are likely to be either cash or highly liquid assets, this form of rehypothecation is likely to cause far less problems than rehypothecation in bilateral collateralization agreements.

Netting efficiency is not the only reason (perhaps not even the main reason) for central clearing. Central clearing will lead to an increase in transparency because the positions of different dealers can be more readily ascertained. It will be lead to more collateral (margin) being posted so that, when a dealer defaults, losses are likely to be less. Furthermore losses will be distributed throughout the clearinghouse members. In the case of bilateral clearing, there is a chance that large losses have to be absorbed by a small number of counterparties.

Another important potential advantage of CCPs is that they may reduce the chance that unsubstantiated rumors lead to the downfall of a dealer. When a dealer is thought to be experiencing difficulties, other dealers may stop posting collateral or refuse to trade with it or enter into trades that are designed to reduce their exposure to the dealer. This may cause cash flow problems for the dealer and hasten its demise. Arguably, this is less likely to happen when trades are done through CCPs because a CCP should ignore rumours in calculating and implementing variation margins.

Of course, there is a risk that a CCP will fail. Traditionally, clearinghouses for exchange-traded derivatives have been well run and there have been few problems. (Basel II assigns a risk weight of zero for trades with a clearinghouse.) The consequences of a failure by a CCP that is used for OTC trades could be even more disastrous than the failure of a large dealer. However, a CCP is nothing like as complex as a large bank. It should be regulated as utility and not allowed to trade on its own account.

3. How Much Can be Cleared?

There are many reasons for wanting to clear centrally as big a proportion of all OTC derivatives trades as possible. This maximizes the netting benefits of central clearing and minimizes counterparty risk. It also gives regulators a better handle on the risks being taken by dealers.

The key requirement for clearing a transaction centrally is that it be possible to value the transaction daily for the purposes of calculating daily variation margins. We have already mentioned that it is important to require the parties to any non-cleared transaction between systemically important counterparties to enter into collateralization agreements for those transactions. They should also agree on a method by which the values of the transactions are calculated for the purposes of the collateralization agreements. Otherwise the collateralization

agreements are liable to be ineffective because of disputes about who owes whom what. It is a short step from this to argue that the valuation methodology should be made available to a CCP so that the transaction can be cleared centrally. Furthermore, if the valuation methodology can be passed to a CCP, it can be made available to regulators for stress testing and other analyses they might wish to carry out.

In considering how easy it is to clear OTC derivatives transactions, it is useful to divide products into four categories:

1. Plain vanilla derivatives with standard maturity dates.
2. Plain vanilla derivatives with non-standard maturities dates.
3. Non-standard derivatives for which there are well established pricing models.
4. Highly structured deals.

Derivatives in the first category are the ones that CCPs are likely to be most comfortable with and the ones that have the potential to be traded on exchanges. Often the current value of transactions in the first category can be observed directly in the market. If this is not the case, it is convenient that interest rates, credit spreads, and similar market variables are required only for standard maturities. (Often the standard maturities are IMM dates.)

For derivatives in the second category, standard procedures are used by the market to interpolate variables such as interest rates, credit spreads, forward prices of assets, and volatilities so that the observable values of these variables can be used to calculate required values. For example, the credit spread for a certain maturity can be estimated from the observed credit spreads for neighboring maturities; the volatility used to price an option that has a certain strike price and time to maturity can be estimated from the observable volatilities of options with neighboring strike prices and times to maturity.

The distinguishing characteristic of derivatives in the first two categories is that they are priced with reference to the market prices of other derivatives of the same type. CDSs are priced with reference to other CDSs; options on an exchange rate are priced with reference to other options on that exchange rate. The procedure where one derivative is priced using other derivatives that trade as reference points is known as "calibration." Derivatives in the first two categories are therefore calibrated to derivatives of the same type for the purposes of pricing.

Derivatives in the third category are different from those in the first two categories in that they are not traded actively enough for them to be calibrated to derivatives of the same type for the purposes of pricing. There are a wide range of derivatives in the third category such as Asian options, barrier options, compound options, basket options, accrual swaps, and so on. Typically they have to be calibrated to other simpler derivatives, and sometimes empirical data has to be used. For example, the price of an Asian option is usually based on the prices of plain vanilla options on the same asset; the price of a basket option is usually based on the prices of plain vanilla options on the assets comprising the basket and correlations between the assets' prices estimated from empirical data; the price of an accrual swap is based on the prices of plain vanilla interest rate swaps and interest rate caps; and so on.

It is probably unreasonable to expect a CCP to develop the technology to price all OTC derivatives in the third category. However, a reasonable requirement is that market participants provide the CCP with valuation software when the OTC derivative is traded. This valuation software would conform to input-output requirements specified by the CCP. Typically, what will be provided will be a core valuation routine that depends on a set of inputs (interest rates, exchange rates, forward prices of assets, volatilities, etc). CCPs will be able to use the routines they develop for derivatives in the second category to carry out interpolations necessary to provide the inputs. Models for valuing the derivatives in the third category are in the public domain, but some dealers are likely to have their own proprietary models in some cases. They should not be under an obligation to provide those models to the CCP. They should be allowed to supply the standard model that is in the public domain providing the model captures the key properties of the transaction.

Derivatives in the fourth category are more problematic because they are usually quite complex and models for valuing them are less readily available. But it is important to find a way of handling them. As mentioned earlier it is often these types of derivatives that lead to huge speculative positions and have the potential to increase systemic risk. Market participants should be given a choice. They can either provide software (agreed to by both parties) to the CCP or they can appoint a third party who will provide daily valuations to the CCP.

The software at CCPs would be made available to regulators for the purposes of stress testing and other analyses. In the case of situations where valuations for transactions are provided by a

third party, the third party should be obligated to carry out analyses for regulators on the transactions when directed. These proposals are designed to ensure that all OTC derivatives are cleared and to make it easier for regulators to understand and analyze what is going in the OTC market. A reasonable time line might involve implementing the proposal for all derivatives in the first two categories within one year and implementing the proposals for all derivatives in the third and fourth categories within three years. Whether it is feasible to apply the proposals to outstanding derivatives transactions as well as to new transactions needs to be given careful consideration.

One issue is that, when a dealer trades with an end user, the dealer's inception profit is liable to lead to a requirement for the end user to post an immediate variation margin. For highly structured products the inception profit is often seems quite high, but is justifiable because of the difficulties in hedging the product and other uncertainties that the dealer faces. It should be permissible for the models communicated to CCPs (or used by third parties) to amortize the inception profit over the life of the transaction. This corresponds to the practice of many financial institutions.

Inevitably there will be some exemptions from central clearing. Industrial end-users for example are claiming their right to an exemption because their dealer-counterparties often do not currently require them to post collateral.[9] Exemptions can be classified as "zero-margin trades." They would still have to be registered with a CCP and daily valuations for them would be required, as for trades that are cleared. However, no initial margin or variation margin would be required from either side and the CCP would not be a counterparty to either side. The advantage of this is that they could be easily included in analyses conducted by regulators.

There are a number of details to be worked out. One issue is how the initial margin requirement on a diverse portfolio of OTC derivatives should be set. This involves a statistical analysis on how large the movements in the value of the portfolio could be over a period of one or two days. Clearinghouses have accumulated considerable expertise in this area. But the way in which

[9] Whether this exemption is necessary is debatable. The reality is that a dealer who does not require collateral is implicitly providing the end-user with a flexible line of credit that covers possible future values of the transaction to the dealer. Given that the dealer is prepared to do this, it should also be prepared to enter into an agreement where it lends the end user funds sufficient to meet the margin amounts required by the CCP.

transactions such as single name CDSs or barrier options, whose values can show big jumps in a day, contribute to initial margin requirements may have to be thought through carefully.

The main benefits of the proposals that have been outlined are a reduction of counterparty credit risk and more transparency for regulators. However, politicians and regulators may also like the proposals for other reasons. The existence of a valuation model might lead less sophisticated counterparties to better understand the risks they are taking. It might also lead to highly complex transactions becoming less common.

There will be of course be resistance to the proposal from some dealers, particularly if they feel that it will make it more difficult for them to negotiate complex deals with high inception profits. However, the proposal is better that the alternative where the ability of financial institutions to innovate and trade in the OTC derivatives is eroded by regulation over time.

4. Conclusions

There are many advantages to using CCPs for over-the-counter derivatives. As the percentage of OTC derivatives that are cleared increases, these advantages increase. This paper has argued that monitoring a financial institution's exposures to non-standard derivatives is as important, if not more important, than monitoring its exposure to standardized derivatives. It is tempting to focus attention on credit derivatives because these were of most concern during the 2007-2009 crisis. But the next big rise in systematic risk in the market may be a result of dealers taking large positions in quite different OTC derivatives from these, possibly ones that have yet to be invented. The regulation of OTC derivatives should allow the monitoring of the market to be as comprehensive as possible. This paper has proposed one of the directions we can go in.

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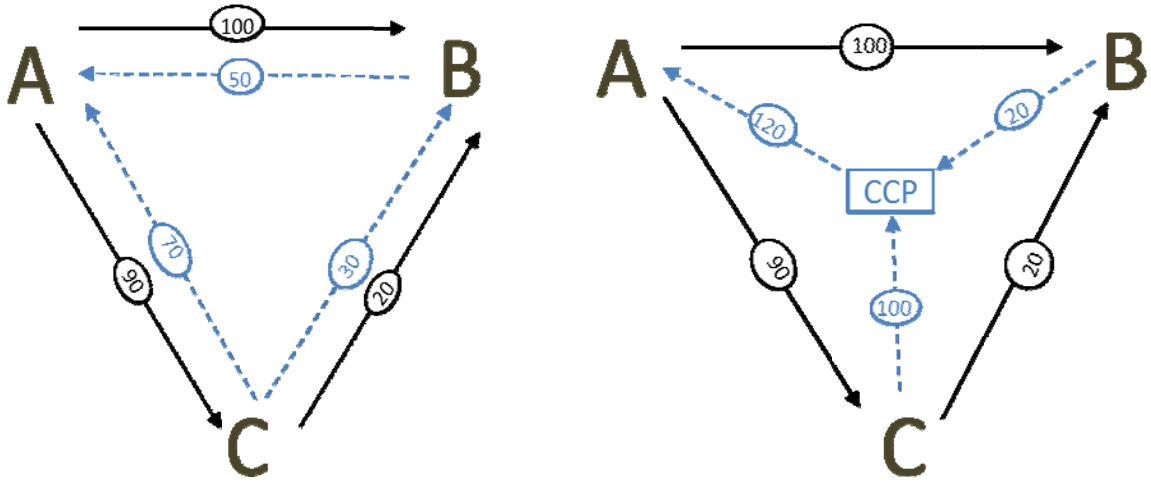
Figure 1: Example of a situation where a CCP increases exposures after netting. The exposures represented by the dotted line are cleared. Those represented by the solid line are not. The exposures after bilateral netting are compared with the exposures when the CCP is used.



Dealer	Exposure after bilateral netting
A	0
B	100
C	20
Ave	40

Dealer	Exposure after netting incl. CCP	Exposure after netting excl. CCP
A	120	0
B	120	120
C	90	90
Ave	110	70

Table 1: Dealer exposures before and after netting (Source: BIS June 2009)

Asset Class	**Exposure ($ billions)**
Foreign Exchange	2,470
Interest Rate	15,478
Equity-linked	879
Commodity	689
Credit Default Swaps	2,987
Unallocated	2,868
Total	25,372
Total after netting	3,744