Regulatory reform of over-the-counter derivatives: an assessment of incentives to clear centrally

A report by the OTC Derivatives Assessment Team, established by the OTC Derivatives Coordination Group

October 2014

BANK FOR INTERNATIONAL SETTLEMENTS

This publication is available on the BIS website (www.bis.org).

ISBN 92-9131-803-2 (print)

ISBN 92-9197-825-4 (online)

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Executive summary

In 2009, the G20 Leaders agreed that standardised over-the-counter (OTC) derivatives contracts should be cleared through central counterparties (CCPs). Since that time, global standard-setting bodies have advanced a number of regulatory reforms that are likely to affect the incentives for central clearing of these contracts. These reforms include requirements to exchange initial and variation margin for non-centrally cleared derivatives exposures, standards relating to the measurement of counterparty credit risk for derivatives contracts, and capital requirements for bank exposures to CCPs.

In view of these changes, the OTC Derivatives Coordination Group[1] commissioned an assessment of the incentives for central clearing of OTC derivatives, recognising that misaligned incentives in this area – as compared to those for bilateral transactions – could lead market participants to take actions that could undermine the regulatory reforms (eg by customising their derivatives trades to avoid mandatory clearing of standardised OTC derivatives contracts). The OTC Derivatives Assessment Team (OTC DAT) was charged with bringing forward this work.[2]

The OTC DAT initiated its assessment by developing a stylised framework for examining the main financial costs of central clearing compared to trading OTC derivatives contracts on a bilateral basis. The framework served as the basis for discussion at an industry workshop held in April 2013, where participants were asked to comment on the appropriateness of the framework for assessing incentives in this area. Insights gained from the workshop informed the development of a quantitative analysis that was conducted during the second half of 2013. The results of the quantitative analysis helped the OTC Derivatives Coordination Group and global standard-setting bodies to better understand the combined impacts of the regulatory reforms on OTC derivatives contracts. It also provided supporting evidence to finalise and approve some key decisions related to proposed regulatory reforms that had not yet been finalised, specifically the revised framework for bank exposures to CCPs and the revised standardised approach for measuring counterparty credit risk (SA-CCR).

The results of the quantitative analysis indicate that clearing member banks (ie those institutions that clear directly with CCPs) have incentives to clear centrally. Central clearing incentives for market participants that clear indirectly (ie that are

[1] The OTC Derivatives Coordination Group is comprised of the chairs of the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS), the Committee on the Global Financial System (CGFS), the International Organization of Securities Commissions (IOSCO) and the Committee on Payments and Market Infrastructures (CPMI) which was previously known as the Committee on Payment and Settlement Systems (CPSS).

[2] The OTC DAT is comprised of staff from a number of supervisory agencies, central banks and global standard-setting bodies. See Appendix 1 for a list of participants.

not directly clearing members of a CCP but clear through an intermediary that is a clearing member of a CCP) are less obvious and could not be comprehensively analysed on the basis of the data received in the quantitative analysis.[3] These "indirect clearers" do not constitute a homogeneous group. Instead, their trading and clearing patterns vary in a number of ways, such as trading frequency, portfolio composition and regulatory requirements. Some, but not all of them, are banks. This makes it difficult to draw any general conclusions on the effect of the reforms on indirect clearers' incentives for central clearing. After the reforms have been introduced, some indirect clearers may have incentives to clear centrally, while others may not. However, given that clearing members account for the bulk of derivatives trading, the conclusion of this analysis – there are incentives for them to clear centrally – indicates that the G20 objective on OTC derivatives reforms has, for the most part, been achieved.

Introduction

This paper analyses whether the post-crisis regulatory reforms developed by global standard-setting bodies create appropriate incentives for different types of market participants to centrally clear OTC derivatives contracts.

To a large extent, incentives to centrally clear OTC derivatives contracts depend on the relative cost of bilateral settlement and central clearing. Important components of these costs are driven by regulatory margining and capital requirements (including counterparty credit risk charges for default risk and credit valuation adjustment (CVA) risk). Many of the regulatory reforms that have been developed by global standard-setting bodies will affect these costs. Specifically, the OTC DAT has considered the following three regulatory reforms (two relating to capital requirements and one relating to margin requirements) together with the impact of the clearing mandate:

- The BCBS standardised approach for measuring counterparty credit risk (SA-CCR) exposures, which replaces the current exposure method (CEM).[4]
- The BCBS-CPSS-IOSCO new standard on capital requirements for bank exposures to central counterparties.[5]
- The BCBS-IOSCO new standard on margin requirements for non-centrally cleared derivatives.[6]

In this analysis, the OTC DAT considered only the effects of global regulatory reforms as issued by the relevant global standard-setting bodies; it did not examine

[3] As part of the data collection exercise, dealer banks were encouraged to report data on their top bilateral buy-side clients to enable a more granular analysis of the incentives for non-financial firms, non-dealer banks, pension funds, insurers, hedge funds, asset managers and other non-bank financials. However, the responses from dealer banks were limited and did not appear to be of sufficient quality to form well founded conclusions in this area.

[4] http://www.bis.org/publ/bcbs279.htm.

[5] http://www.bis.org/publ/bcbs282.htm.

[6] http://www.bis.org/publ/bcbs261.pdf, published in September 2013.

national implementations of these reforms or any jurisdiction-specific reforms. Further, at the time of initiating the analysis, the reforms were under consultation and final rules had not been published. Therefore, changes between the consultative documents and the final rules could alter the conclusion of this report.

Other reforms, such as the Basel III liquidity coverage ratio, the leverage ratio and the CPSS-IOSCO principles for financial market infrastructures (PFMIs),[7] could also affect incentives in this area, but their impact on incentives for central clearing was not readily quantifiable and thus they were not included in the assessment study.

It should be noted that the OTC DAT's assessment differs from the work published by the Macroeconomic Assessment Group on Derivatives (MAGD) in several respects,[8] most notably in that it does not attempt to estimate the broad economic costs and benefits of a complete set of regulatory reforms. Instead, it considers the relative costs associated with clearing OTC derivatives contracts in order to formulate a view on incentives to centrally clear stemming from specific regulations.

The remainder of this report is structured as follows:

- Section I describes the key components of the stylised framework.
- Section II presents the quantitative analysis and its results.
- Section III outlines some limitations of the analysis.
- Section IV discusses end user perspectives and incentives to centrally clear.
- Appendix 1 presents the names of institutions and individuals participating in the OTC DAT.

I. Stylised framework

This section presents a stylised framework to analyse the regulatory cost components of using derivatives in bilateral trading and central clearing. These costs differ for different market participants depending on their role, their jurisdiction and the regulatory rules with which they have to comply. Specific consideration is given to capital and collateral costs stemming from recent regulatory reforms for derivatives contracts. For this purpose, capital costs are simply defined as the incremental cost a bank incurs to finance more of its assets with equity (as a consequence of the incremental regulatory capital requirements) rather than with debt. Collateral costs include the incremental cost of borrowing cash to acquire eligible collateral.

The stylised framework was based on the standardised methods for estimating capital and margin requirements initially available when the analysis started in 2012. In the meantime, the SA-CCR has been developed, and the capital requirements for

[7] *Principles for Financial Market Infrastructures*, published in April 2012 at http://www.bis.org/publ/cpss101a.pdf.

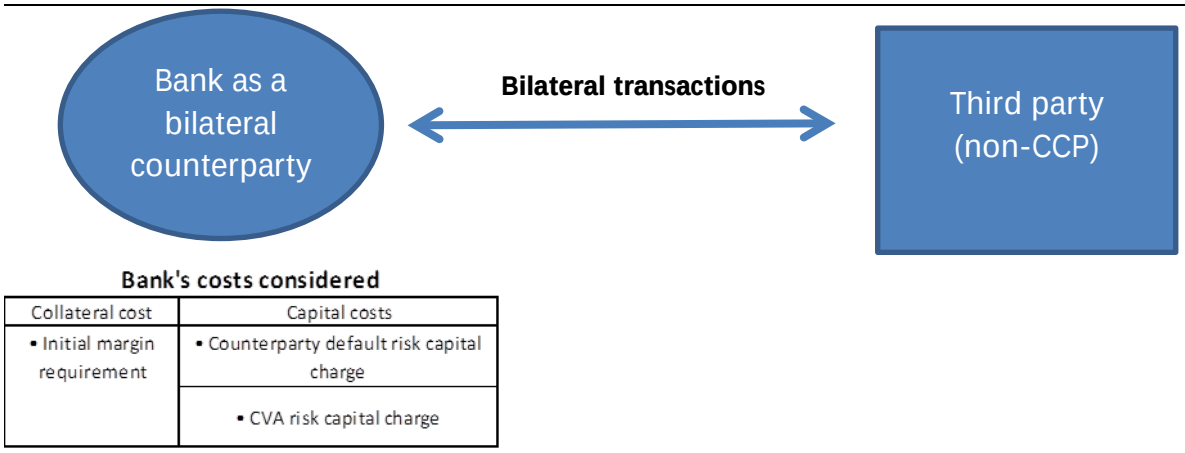
[8] The August 2013 report *Macroeconomic impact assessment of OTC derivatives regulatory reforms* can be found at http://www.bis.org/publ/othp20.pdf.

bank exposures to central counterparties have been revised. However, the purpose of the stylised framework section was to clarify with a simple example what the costs are for bilateral trading and central clearing and how high they are under standardised calculation methods. Hence, it should be seen not as a proper analysis of the costs but rather as a presentation of the different cost components and how they can interact.

Costs of bilateral trading

We assume that when trading bilaterally, a bank faces a non-central counterparty. In this context, the bank incurs both capital and collateral costs to execute the trade. Figure 1 depicts the three regulatory cost components associated with bilateral trading analysed in this incentive study.

Cost of a bilateral trade under the stylised framework — Figure 1



As illustrated by Figure 1, the OTC DAT focused on one cost component related to the cost of collateral and two components related to the cost of capital. The cost of collateral corresponds to the initial margin requirements for non-centrally cleared derivatives contracts.[9] Initial margin is required to be posted on a two-way "gross basis" and kept in an account that is bankruptcy remote from the margin receiver. This implies that both parties to such contracts incur costs to fund eligible collateral, net of any income generated by that collateral.

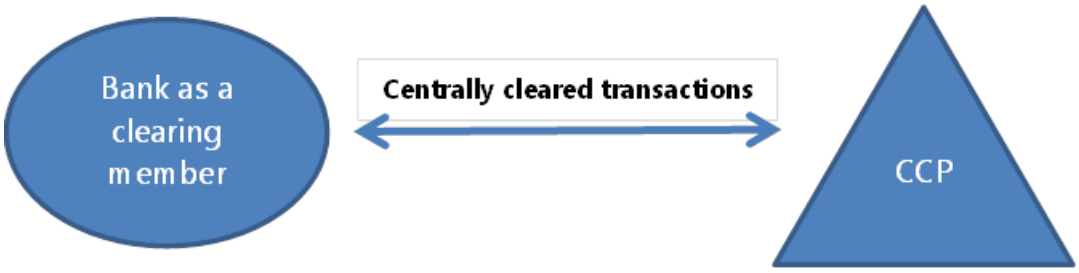
Banks are also subject to capital requirements against counterparty credit risk (CCR), which result in capital costs in our stylised framework. The Basel prudential framework includes two separate CCR capital requirements against default risk ("default capital charge") and CVA risk ("CVA capital charge"). The default capital charge is intended to cover any losses due to the default of the counterparty, while the CVA capital charge addresses the potential mark-to-market loss caused by an increase in the credit spread of the counterparty. The latter charge was not required under Basel II and applies only to bilateral transactions under Basel III.

[9] See *Margin requirements for non-centrally cleared derivatives* at http://www.bis.org/publ/bcbs261.pdf.

Costs of central clearing

As is the case for bilateral trades, banks incur regulatory costs when clearing OTC derivatives through a CCP. These costs can also be divided into collateral and capital costs. The collateral costs are the same as for the bilateral case, ie banks must finance the collateral posted as initial margin to the CCP. Under the Basel prudential framework, the capital requirements associated with centrally cleared derivatives contain two separate components: capital charges for trade exposures and capital charges for default fund exposures. The first component relates to the risk that the CCP does not pay the amounts due to the firm on derivatives that are "in the money" from the firm's perspective as well as the potential that the bank may lose any non-segregated collateral that it has posted to the CCP upon default of the CCP. The second component relates to the risk of default of one or more clearing members of a CCP, which could result in the bank forfeiting its contribution to the mutualised loss resources of the CCP. Figure 2 depicts these costs together with other attendant costs of central clearing.

Costs with central clearing under the stylised framework — Figure 2



Bank's costs considered

Collateral costs	Capital costs
• Initial margin requirement	• Trade exposures capital charge
• Default fund requirement	• Default fund exposures capital charge

Cost comparison using a single trade

This section provides an example of the relative costs of bilateral trading and central clearing using a single, stylised interest rate swap with a maturity of five years and a notional amount of USD 1 million (Table 1). As discussed above, this analysis assumes that the bank calculates capital charges using standardised methods for estimating capital and margin requirements. However, it should be stressed that the numbers in the example are not to be considered as representative either in an absolute or in a relative sense but instead serve to illustrate the various regulatory cost components.

Breakdown of cost components for a stylised example

Table 1

Estimated cost example (USD)	Bilateral	Central clearing
Potential future exposure	**5,000**	**5,000**
Total collateral required (initial margin + default fund)	**700**	**572**
Counterparty credit risk	80	8
Credit valuation adjustment	310	n/a
Default fund capital requirement	n/a	72
Offset for initial margin received (for bilateral only)	–11	n/a
Total capital required	**379**	**80**
Costs		
Cost of collateral (0.7% x total collateral required)	5	4
Cost of capital (6.7% x total capital required)	25	5
Total costs	**30**	**9**

Aggregate cost example for a stylised example (single interest rate swap) in US dollars

Graph 1

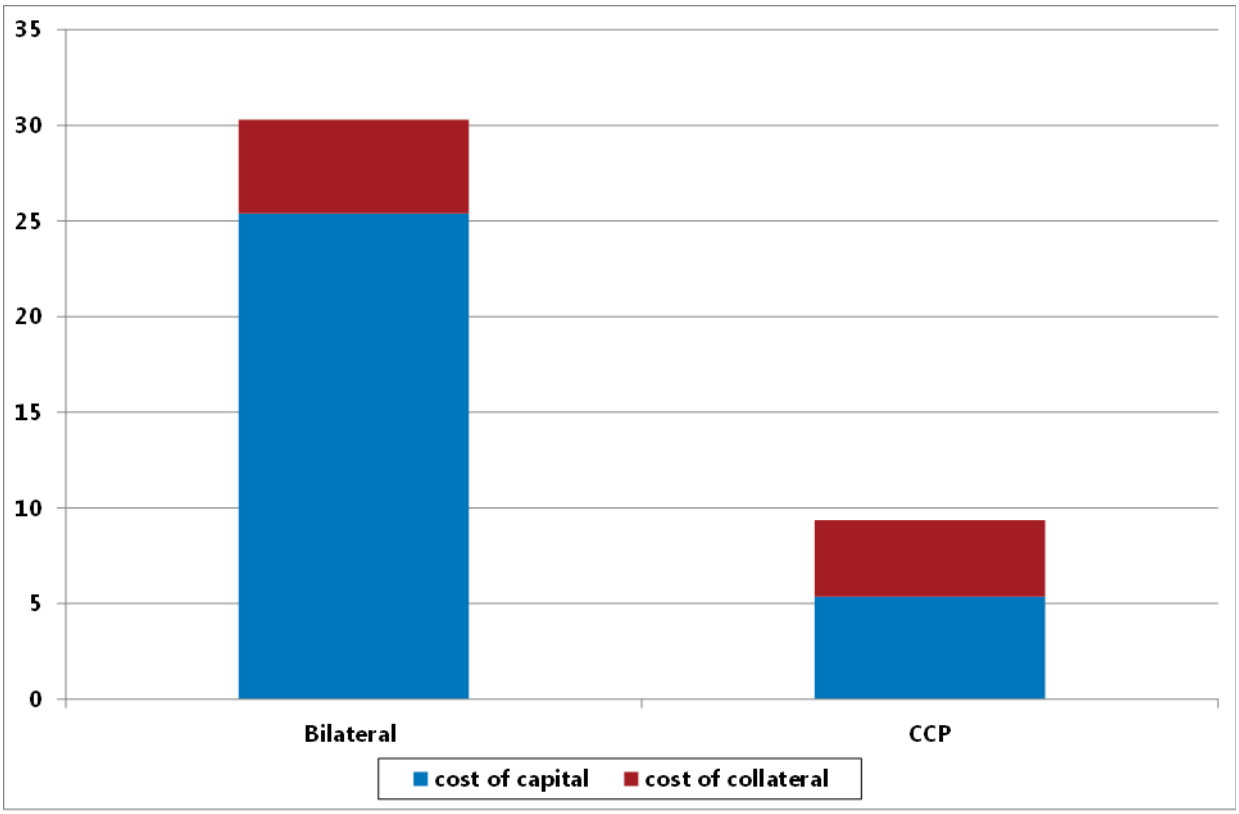


Table 1 indicates the primary drivers of incentives to centrally clear in this simple example:

1. Capital requirements for CVA volatility for bilateral trades.

2. The quantity of initial margin posted to the CCP and the amount of bilateral initial margin exchanged between counterparties.
3. The capital requirement for the default fund for central clearing.
4. The capital requirements for counterparty credit risk for bilateral and centrally cleared trades.

The above stylised example can be useful for introducing key concepts and comparing at a high level simplified regulatory costs for bilateral trading and central clearing. However, it is not possible to extrapolate general conclusions about incentives on the basis of these observations. To obtain greater depth of understanding of the relative incentives and reach more informed conclusions, it was necessary to conduct a more thorough quantitative analysis, drawing upon data derived from actual bank and CCP portfolios.

II. Quantitative analysis

Due to the limitations of the stylised framework, further work was needed to understand how present and future regulatory requirements will affect the costs of bilateral trading and central clearing. In addition, the stylised framework did not include the impacts of the revised SA-CCR or the revised capital requirements for exposures to CCPs. The impetus behind the quantitative analysis was therefore to ensure that the standard-setting bodies' new regulatory initiatives were – to the extent possible – developed in such a way that they would provide incentives for central clearing. The need to assess the incentives during the development phase of the initiatives necessitated a parallel process where the quantitative analysis was based not on the final rules text but on consultative versions of the rules. The results of the quantitative analysis were then utilised to assess the appropriateness of the consultative rules text and therefore influenced the final rules text. As a result, we were not able to base the analysis in this study on the final rules of SA-CCR and the revised capital requirements for exposures to CCPs.

This study focuses on three regulatory reforms (two revised capital requirements plus the new margin requirements) and their impact on the incentives for central clearing:

- The new standardised approach for counterparty credit risk.
- The new standard for capitalisation of banks' exposures to CCPs.
- The new margin requirements for non-centrally cleared OTC derivatives.

These three regulatory reforms are described in more detail below.

Standardised approach for counterparty credit risk

The standardised approach for counterparty credit risk (SA-CCR) will affect capital requirements on bilateral and centrally cleared trade exposures for banks that do not have supervisory approval to use internal models. Currently, these banks mainly

use the current exposure method (CEM).[10] Importantly, the SA-CCR is intended to differentiate between transactions with and without margins, a feature that the CEM did not have. As a result, capital requirements for bilateral margined trades for these banks without approval to use internal models may decrease compared to the CEM. For unmargined trades, the calibration of the SA-CCR is more conservative than the CEM in some cases (since it is based on a stressed calibration), implying a potential increase in the associated capital requirements.

Capitalisation of banks' exposures to CCPs

The new rules for the capital requirements for bank exposures to central counterparties will directly impact banks' regulatory capital cost of central clearing. A major part of banks' exposures to central counterparties consists of the default fund contributions. One important assumption this analysis makes about the capitalisation of banks' exposures to CCPs is that all CCPs are considered to be qualifying – that is, to be subject to regulations consistent with the principles for financial market infrastructures developed by CPSS-IOSCO. The final rules text estimates these default fund exposures based on a hypothetical level of default resources calculated using a BCBS-approved methodology based on the standardised approach for counterparty credit risk for measuring capital requirements for derivatives exposures ("Kccp"). The analysis in this paper therefore focuses on this way to estimate the exposure to default funds. In the process of deciding on the final rules, another way of estimating the default fund exposure was also considered. It was based on the minimum level of default resources that a CCP must maintain under the CPSS-IOSCO PFMIs ("Cover*"). The analysis was also carried out using the latter approach, making it possible to estimate the financial cost incentives under this alternative.

Margin requirements for non-centrally cleared OTC derivatives

The margining requirements for non-centrally cleared derivatives will require the bilateral exchange of variation margin and initial margin. This will significantly increase the amount of collateral required to trade bilaterally, resulting in an increased collateral cost. However, generalisation of collateralisation as well as better recognition of collateral as a credit risk mitigant under the SA-CCR may result in a decrease in the capital requirements against counterparty risk.

Scenarios of the quantitative analysis

Since the study intended to capture different effects of the reforms, participants were asked to provide data under three different scenarios (or "states") of the regulatory framework affecting OTC derivatives:

[10] Banks may also use the standardised method (SM), but it is rarely employed.

"State 0": current capital and bilateral margin requirements pre-clearing mandate.

Under the first scenario, banks were requested to provide data on their current capital requirements (ie under Basel III) and collateral arrangements associated with their cleared and non-cleared derivatives portfolios. This means that banks used standardised methods for capital requirements where they currently apply standardised methods, and models were instead used for those parts of banks' activity for which they currently have supervisory model approval. A breakdown of the centrally cleared portfolios with nine major CCPs (called incentive assessment CCPs or IA-CCPs) that clear the majority of the OTC derivatives was requested.

"State 1": future capital and bilateral margin requirements pre-clearing mandate.

Under the second scenario, banks were requested to provide data on the same portfolios, but assuming that the three new regulatory reforms considered in this study had all been implemented.

"State 2": future capital and bilateral margin requirements post-clearing mandate.

Finally, banks were asked to recompose their centrally cleared and non-centrally cleared portfolios, assuming that all clearing-eligible bilateral trades were moved to CCPs.[11] To ensure a consistent and objective portioning of the clearing-eligible bilateral trades to CCPs, it was assumed that there is one hypothetical CCP for each of the five main asset classes (called asset class CCPs or AC-CCPs). This assumption may overestimate the benefits of multilateral netting, since in practice we would expect several CCPs operating in each OTC asset class.

By moving bilateral trades to CCPs, two "portfolio effects" are produced:

- **The "break-hedge effect" in bilateral portfolios.** If participants have bilateral portfolios in which clearing-eligible trades act to hedge risks on clearing-ineligible trades, removing those clearing-eligible trades from the portfolios may reduce hedging benefits. As a consequence, the exposures and the initial margin of those portfolios are likely to increase, resulting in an increase of costs.
- **The multilateral netting effect in central clearing.** For banks with many counterparties, moving clearing-eligible trades from multiple bilateral counterparties to a single CCP would be expected to reduce overall exposures, due to the multilateral netting achieved by the CCP. Absent the break-hedge effects described above, the overall exposure of the bank is expected to decrease, resulting in a decrease in costs.

This analysis indicates whether banks have incentives to move current bilateral trades to CCPs, when mandated. If banks are not incentivised to do so, they may try to circumvent the clearing mandate by using more complex instruments not eligible for central clearing rather than standardised cleared products.

[11] The list of clearing-eligible trades was taken from the quantitative impact study performed by the Working Group on Margining Requirements (WGMR) in 2012.

Quantitative analysis scenarios

Table 2

	State 0 Current regime under Basel III	**State 1** Post-reform implementation	**State 2** Post-clearing mandate
Bilateral capital requirements	CEM Internal model method	SA-CCR Internal model method	SA-CCR Internal model method
Bilateral margining requirements	Current practice but no requirements	WGMR requirements	WGMR requirements
Capital requirements for exposures to CCPs	Interim method	New method	New method
Portfolio	Current bilateral Current centrally cleared	Current bilateral Current centrally cleared	Current bilateral – clearing-eligible Current centrally cleared + clearing-eligible
CCPs	9 IA-CCPs	9 IA-CCPs	5 AC-CCPs

Participating banks

The quantitative analysis is based on data from 20 banks. In cases where there were data quality issues, the analysis was limited to a qualitative assessment.

Representativeness of the sample

The total OTC gross notional amount reported by the participating banks comes to approximately 25% of the total global gross notional amount in OTC derivatives.[12] Hence, the analysis is based on a sample only, not on the full population.

Table 3 shows the breakdown of the total gross notional amount between centrally cleared and non-centrally cleared, grouped per asset class, across all participating banks in the quantitative analysis. Exposures to CCPs that only clear exchange-traded, but not OTC, derivatives are not included in this study, as it focuses only on costs associated with OTC derivatives. However, exposures to CCPs that clear both OTC and exchange-traded products together are included. For reference, the total gross notional amount as estimated from the BIS OTC derivatives statistics is also reproduced in the table.

[12] The total notional amount aggregated across respondents in the data collection exercise is not adjusted for double-counting, since we capture data from less than half of the 16 largest dealers ("G16"). Therefore, the gross notional amount reported here is an upper bound on the share of the market captured in this analysis. We take as our baseline an estimate of the total global notional amount in March 2013 (the reporting date for the quantitative data). This estimate is an interpolation between notional values reported for December 2012 and June 2013 in *BIS Statistical release: OTC derivatives statistics at end-June 2013* (http://www.bis.org/publ/otc_hy1311.pdf).

Total OTC gross notional amount in the sample (in billions of euros) Table 3

	Interest rate derivatives	Foreign exchange derivatives	Credit derivatives	Equity derivatives	Commodity derivatives	Total
Non-centrally cleared	58,272	15,824	4,170	1,588	566	80,421
Centrally cleared	56,533	21	458	0	0	57,013
Total in sample	114,805	15,845	4,629	1,588	566	137,434
Total global	403,585	53,944	18,938	5,020	1,937	508,879
Sample as share of global	28%	29%	24%	32%	29%	27%

Definitions and assumptions

This section provides information on how costs have been defined and what important assumptions have been made in the analysis.

Definition of regulatory costs

The regulatory costs considered in this study stem from capital and margin requirements. In order to increase the amount of regulatory capital, banks need to finance more of their assets with equity instead of debt. We therefore define the cost of capital as the difference between the cost of equity and the cost of debt. The cost of collateral is defined as the difference between the cost of debt and the interest earned on collateral. The costs of capital and collateral were the same as those used in the *Macroeconomic impact assessment of OTC derivatives regulatory reforms* (MAGD report).[13]

- Incremental cost of regulatory capital: 6.7%.
- Cost of collateral: 0.7%.

It should be noted, however, that there may be other significant costs, which are not included in this analysis. For instance, cost of IT systems can be a non-trivial component of both central clearing and bilateral trading.

Additional assumptions used for the exercise

Estimating the cost of full implementation of new global regulations necessitates making assumptions about how national regulators will implement these reforms and how market participants will react. In this analysis, we consider the global reforms in their final "steady state" in "state 2". Thus we disregard the national implementations as well as any grandfathering rules, phasing-in of requirements, etc. Where possible, we have used the same assumptions as those used in the MAGD report.[14]

[13] A scenario analysis using a high-cost and a low-cost scenario was also performed but did not alter the observations.

[14] For additional details on the data collection, see http://www.bis.org/bcbs/qis/iainst_jul13.pdf.

Non-centrally cleared derivatives

One of the important assumptions made in our quantitative analysis is that banks were asked to estimate their initial margin requirements using internal models that are consistent with the new margin requirements. For banks without internal models, the new margin requirements have specified a standardised methodology for calculating initial margin. However, having considered the complexity of the data request, we asked these banks to make the simplifying assumption that the new SA-CCR is the standardised method for calculating initial margins. Since the SA-CCR is calibrated to an average exposure measure while initial margins should be based on a peak exposure measure with a high confidence level, the new approach may underestimate initial margin levels, and the results herein should be viewed as providing a potentially lower bound on initial margin requirements.

Banks were also asked to make some assumptions about how their portfolio-level credit valuation adjustment capital charges are allocated to counterparties; and about how hedging of counterparty credit risk is accounted for in their costs. In the former case, banks were asked to allocate their portfolio-level CVA capital costs in a way consistent with how they price trades, so this assumption should broadly reflect costs on bilateral portfolios. In the latter case, banks were asked to ignore the CVA and the counterparty credit risk hedges for current portfolios; this might lead to an overestimate of current capital levels against bilateral portfolios.

Centrally cleared derivatives

To assess the costs of central clearing post-clearing mandate (state 2), banks were asked to move clearing-eligible trades to CCPs. This list of clearing-eligible trades was taken from the quantitative analysis performed by the WGMR, the group that proposed the new margin requirements. To ensure a consistent and objective portioning of the clearing-eligible bilateral trades to individual CCPs, we assumed that there is one CCP for each of the five main asset classes (AC-CCPs) in state 2. This is consistent with the assumptions used in the MAGD report. This assumption may result in an overestimation of netting efficiency, as in practice there may be more than one CCP per asset class, leading to a potential increase in the cost of central clearing compared to our results.

Once all current centrally cleared and clearing-eligible trades had been assigned to the five AC-CCPs, banks were asked to estimate the initial margin requirements on centrally cleared portfolios using the same model as used for bilateral margin requirements, but scaled down to reflect a five-day margin period of risk as opposed to 10 days for bilateral trades. The results of the present quantitative analysis are therefore sensitive to how closely banks' estimates of initial margin align with CCPs' actual initial margining practices.

To estimate capital requirements for centrally cleared portfolios, we assume that the ratio of the size of default funds to initial margin remains constant for each asset class, consistent with the assumptions in the MAGD report. We estimated the ratio using data collected in an earlier quantitative analysis, and used this data to estimate the size of the default funds for future centrally cleared portfolios. Finally, a risk weight for each AC-CCP was applied based on representative values from this other quantitative analysis.

Impacts of the regulatory reforms on the current portfolios

Table 4 shows the relative impact on the costs of the participating banks from implementing the three new regulatory requirements. Results are presented for banks' current bilateral and centrally cleared portfolios, respectively, and in total (states 0 and 1 as well as the difference between the states). The total cost is calculated as the sum of collateral cost and capital cost.

Impact of the new capital and margin requirements considered on current portfolios (in millions of euros)

Table 4

	Centrally cleared			Non-centrally cleared			Total		
	Current rules (state 0)	(state 1)	Change	Current rules (state 0)	(state 1)	Change	Current rules (state 0)	(state 1)	Change
Gross notional amount (in billions of euros)	56,145	56,145	0	80,025	80,025	0	136,170	136,170	0
Collateral costs	65	65	0%	8	660	7,726%	74	725	882%
Capital costs	54	13	–75%	2,807	1,657	–41%	2 861	1,671	–42%
Total costs	119	79	–34%	2,816	2,317	–18%	2,935	2,396	–18%

Observations on incentives to clear centrally

To translate the results from Table 4 into incentives, the costs attributed to centrally cleared and bilateral transactions need to be compared using an equal basis. As there is no perfect basis on which the total costs should be compared, we chose to convert the absolute cost figures in Table 4 into unit costs with the help of gross notional amounts. An alternative unit cost based on exposures produced the same ordering of costs between bilateral trading and central clearing but with much smaller differences.[15]

Cost per unit of notional volume (in basis points)

Table 5

	Pre-reform (state 0)	Post-reform (state 1)
Bilateral	0.352	0.290
Centrally cleared	0.021	0.014

These numbers suggests that central clearing was cheaper than bilateral trades before the reforms and became even less expensive after the implementation of the reforms, reinforcing incentives to clear centrally.

[15] The ordering of costs was reversed when Cover* was used in state 1 for centrally cleared trades, implying that incentives did not seem to be properly aligned.

Bilateral trades are likely to incur lower costs under the new post-reform standards compared to the pre-reform standards. The data indicate that costs for bilateral trades will fall by approximately 20% when these standards are applied. Two opposite forces drive the overall reduction in costs. On the one hand, new margining requirements for non-centrally cleared derivatives imply increased margin requirements and thereby higher costs for funding this collateral. On the other hand, the proposed introduction of the new SA-CCR gives greater recognition to collateral in mitigating counterparty credit risk. Therefore, exposures under both the internal model method and the new SA-CCR will fall, resulting in lower capital requirements.

The reforms imply a substantial reduction in regulatory costs for banks' current centrally cleared portfolios. In aggregate, the costs fall by approximately 34%, ie by a larger percentage than for bilateral portfolios. This suggests that the regulatory reforms reinforce the G20 mandate by incentivising central clearing.

Impacts of the clearing mandate

This section brings together the impacts of all regulatory reforms and the effects of the clearing mandate on respondents' portfolios (from state 1 to state 2). This includes both the impact of moving all clearing-eligible bilateral trades to CCPs after the three reforms have been implemented and reassigning all current centrally cleared trades from the nine IA-CCPs to the five AC-CCPs.[16]

Implementing the clearing mandate on current portfolios simply involves moving clearing-eligible trades from bilateral to centrally cleared portfolios. However, this shift has a significant effect on the participating banks' portfolios; approximately half of the current bilaterally traded portfolios are moved to central clearing, as measured by the gross notional amount. This suggests that there are many bilateral trades that are eligible for central clearing, highlighting the need to provide banks with incentives not only to continue to clear existing trades with CCPs but also to move bilateral trades to CCPs, where appropriate. The assumption that all clearing-eligible trades will be centrally cleared under the clearing mandate therefore implies a shift from the majority of gross notional volumes currently residing in bilateral portfolios to the majority being in cleared portfolios.

Note that since we assume a single CCP per asset class, we would expect that the multilateral netting benefits arising from central clearing in practice may be weaker than the results in the table imply, since portfolios in a given asset class would be split between two or more CCPs. We have also assumed that all clearing-eligible trades with all counterparties will be centrally cleared in the future. This will, however, be unlikely; consequently, the true netting effects will depend on the types of counterparty portfolios that are captured by the mandate and those that are not. This means that we may have overestimated the multilateral netting efficiency in CCPs.

Table 6 indicates that the total cost of collateral is mainly unchanged on introduction of the clearing mandate. However, collateral is reallocated from

[16] Note that since this section intends to highlight the effect of the clearing mandate, it does not consider the current CCP structure but the AC-CCP structure as a starting point. Due to differences in netting as well as margin assumptions, the numbers for both collateral and capital are not directly comparable to those for the centrally cleared state 1 in Table 4.

bilateral to centrally cleared portfolios. Initial margins for CCPs increase by almost the same amount as bilateral initial margins decrease from state 1 to state 2, if scaled to reflect a margin period of risk of 10 days. This may suggest that gains in netting efficiency made by increasing multilateral netting on centrally cleared portfolios could be offset by losses of netting benefits on bilateral portfolios. In other words, the "break-hedge effect" when moving trades from bilateral to centrally cleared portfolios appears to be as important as the multilateral netting effect in CCPs.

Impact of the clearing mandate after implementation of the three revised regulations

(in millions of euros) Table 6

	Centrally cleared			Non-centrally cleared			Total		
	Current portfolio (state 1)	Future portfolio (state 2)	Change	Current portfolio (state 1)	Future portfolio (state 2)	Change	Current portfolio (state 1)	Future portfolio (state 2)	Change
Gross notional volume (in billions of euros)	56,169	87,512	56%	79,346	37,295	–53%	135,515	124 806	–8%
Collateral costs	23	141	515%	657	510	–22%	680	651	–4%
Capital costs	3	12	364%	1,624	1,193	–27%	1,627	1,205	–26%
Total costs	26	153	500%	2,282	1,703	–25%	2,307	1,856	–20%

Observations on incentives to clear centrally

As in the analysis presented in Table 5, the costs attributed to centrally cleared and bilateral transactions are compared using cost per unit of notional volume as a basis in Table 7.

Cost per unit of notional volume

(in basis points) Table 7

	Pre-reform, post-clearing mandate (state	Post-reform, post-clearing mandate (state 2)
Bilateral	0.287	0.456
Centrally cleared	0.0046	0.017

Table 6 indicates that the total costs decrease by 20% when the clearing mandate is introduced. However, the total gross notional volume in Table 5 also decreases, by 8%, from the current to the future portfolio. This missing notional volume indicates some potential error in the way that firms have moved trades from bilateral to cleared portfolios, and this error may potentially distort the fall in total costs and weaken the observation that incentives appear to be properly in place.

When jurisdictions start mandating central clearing of standardised OTC derivatives, multilateral netting benefits may increase when more trades are cleared at a specific venue. On the other hand, migrating clearing-eligible trades to CCPs may cause hedging relationships in bilateral netting sets to be broken and netting

benefits to be reduced for existing bilateral trades that are not clearing-eligible. This "break-hedge effect" might actually increase exposures for the residual bilateral netting sets.

When "clearing-eligible" trades are assumed to migrate to central clearing, aggregate total costs appear to be lower than with the present clearing pattern (Table 6). This indicates that banks would have incentives to move clearing-eligible trades to CCPs. It should be noted, though, that these results depend on the assumption that only one CCP exists per asset class. The incentives could be modified if a more fragmented clearing configuration were assumed.

III. Limitations

There are a number of limitations to the above analysis, including the following:

- The analysis is restricted to considering trades that existed at the reporting date. It does not consider or try to anticipate any changes in market participants' behaviour in response to the regulatory reform initiatives considered.
- The analysis assumes that all clearing-eligible trades will be moved (back-loaded) to CCPs.
- The analysis does not consider whether collateral availability or costs may be affected as a result of reforms.
- The analysis does not consider the impact of changes in CCPs' margin models (eg to meet the PFMI standards), which may affect the cost of central clearing.
- The analysis is based on a limited data set. Therefore, the results may not be fully representative of the effects across the full spectrum of banks.
- The analysis is based on a number of assumptions about the relative changes in portfolio compositions resulting from the central clearing mandate. Implementing the G20 commitment of centrally clearing standardised OTC derivatives in different jurisdictions can cause incentives to vary. Furthermore, as the global standards in many cases have not yet been transposed into detailed national rules, the exact interpretation may be unclear in some cases. Therefore, some banks may have applied the rules in a different manner than intended when they supplied the data for this exercise.
- For banks and other institutions that do not have direct access to CCPs and therefore access central clearing indirectly, the results are less clear. The available data on these indirect participants are not granular and comprehensive enough to permit us to assess whether incentives for central clearing are aligned for indirect clearers. There are preliminary indications that total clearing costs for some of these indirect participants remain lower for bilateral trading than for central clearing. Additional data and empirical analysis would be needed to draw any firmer conclusions.
- The analysis does not take into account potential changes to market participants' behaviour – including their desire to rebalance the bilateral portfolios after central clearing becomes mandatory, which can significantly reduce their exposures and associated capital and collateral costs – or potential

changes in trading strategies and volumes of OTC derivatives due to the central clearing mandate or to other reform initiatives that apply eg to the leverage ratio, liquidity coverage ratio or the large exposure limit.

- The analysis focuses on financial costs of counterparty risk capital and initial margin collateral, and therefore measures neither the added benefits of reduced counterparty risk nor the incremental costs resulting from increased concentration due to central clearing. Moreover, the analysis does not include the effects of changing liquidity needs or the associated costs of (intraday) variation margin that result from the central clearing mandate.
- The PFMIs and their implementation in different jurisdictions may affect the cost of central clearing, eg due to changes in margin methodology or default fund requirements. The quantitative effects of these changes were not assessed in this incentives study.
- The analysis is based on the consultative versions of the new SA-CCR and capital requirements for bank exposures to CCPs as formulated in 2013. Differences between the consultative and final versions have not been taken into account.
- The direction and amount of incentives based on the capital and collateral cost differential derived from the quantitative analysis depends on the capital and collateral unit costs assumed for large banks. These costs, in turn, are based on the assumptions made in the MAGD report. Those assumptions may change for other market participants. For example, the cost of capital and of collateral may be the same for some market participants, such as hedge funds.

IV. End users' perspectives

As noted in the preceding section, the incentives to centrally clear OTC derivatives are less obvious for institutions that cannot clear directly at a CCP and therefore access central clearing indirectly through a clearing member.

Different end users

There are many different kinds of these indirect clearing participants or "end users", each of which has a distinct business model that determines its trading strategies. The end users include:

- Insurance companies and pension funds that hedge long-term interest rate risks in their investment portfolios.
- Asset managers that use OTC derivatives to hedge risks or as investment tools.
- Central banks.
- Hedge funds that adopt a variety of trading strategies.
- Corporates (non-financial firms) that are generally directional in their approach, hedging key business risks.

- Non-dealer banks that use OTC derivatives as a tool for their asset-liability management.

Each end user adopts trading or hedging strategies fitting its business model. When compared to the trading strategy of a dealer bank, an end user's portfolio is typically more directional, guarding against unwanted volatility arising from key business risks. Moreover, end users often transact through one or a few brokerage firms or prime brokers, whereas dealers typically face a significant number of counterparties in the OTC derivatives market. This means that the benefits derived from multilateral netting by CCPs will be less pronounced for end users than for dealer banks, and the incentives to clear centrally will be relatively weaker.

End users are also subject to different regulatory requirements. Furthermore, many (but not all) end users have a much smaller footprint in the OTC derivatives market than typical broker-dealers like the ones covered in this analysis, so they may fall below the thresholds in the margin requirements and become effectively exempted from the margin requirements to post and collect initial margin on non-centrally cleared derivatives.

Workshop results

The lack of high-quality, comprehensive data for these end users makes it difficult to make far-reaching conclusions about their relative incentives. Notwithstanding these data challenges, the OTC DAT obtained useful feedback from participants at the industry workshop in April 2013 on the relative incentives for end users.

Key topics raised by workshop participants included:

- Incentives to centrally clear differ among end users, given their disparate business models, cost structures and regulatory environments. In this regard, a distinction was made between "risk-takers" (eg hedge funds) and "hedgers" (eg institutions such as corporates, insurers and pension funds that employ OTC derivatives for hedging purposes).
- The risk-takers reported significant savings as a result of central clearing activities (with one institution citing savings as high as 40% of clearing costs) and were generally positive about the benefits of central clearing. They noted that they required fewer professionals to manage their counterparty exposures as a result of the move towards central clearing.
- The hedgers, whose portfolios are more directional in nature than those of their dealer bank and risk-taker counterparts, were less enthusiastic about the benefits of central clearing, citing concerns about:
    - The security of their collateral (they perceived greater security for their collateral when it was placed with custodian banks in a bilateral trading relationship).
    - Costs (including opportunity costs) associated with obtaining eligible collateral for a given CCP, including via collateral transformation services provided by clearing member banks.
    - The lack of cross-product netting at CCPs and the potential for "breaking" or disrupting bilateral netting sets and thereby obtaining fewer netting

benefits overall (at least until the central clearing market is more fully developed).

- Less certainty about margining practices for CCPs as compared with bilateral trading relationships.
- Operational and liquidity risks associated with meeting variation margin calls intraday across multiple currencies.

In total, they favoured the relative stability of bilateral trading and the customisation it affords.

- Notwithstanding their concerns and preferences, the hedgers acknowledged that the benefits of central clearing would become more pronounced as the market developed in the medium to longer term.

Effects of regulatory requirements on different end users

The framework presented in this paper allows specific types of end users to analyse which costs are relevant for their purposes by performing a sort of component analysis to determine the incremental effects of changes in capital or margin requirements.

For example, if an end user is not subject to capital requirements for counterparty credit risk, its incentive for central clearing is reduced because the absence of capital costs lowers the cost of bilateral trading. In contrast to the bilateral case, the end user is likely to incur expenses (ie higher clearing fees) related to capital requirements imposed on its clearing member bank for the related counterparty risk exposure to a CCP.

For end users that are not subject to the margining requirements on non-centrally cleared derivatives (or that fall below the margin requirement thresholds), the impact on incentives to clear centrally is not straightforward. In the absence of regulatory requirements, some firms may choose not to exchange initial margin. On the other hand, the requirement to post and receive initial margin can actually reduce the total costs of bilateral trading because margin collateral reduces the related capital requirement and the costs of capital exceed the costs of collateral. Where this is the case, firms may choose to exchange initial margin even though they are not required to do so. The actual impact on incentives to clear centrally could vary across firms.

Table 8 collates the feedback from the industry workshop and some further analysis to highlight the qualitative and directional effects on incentives of the various regulatory requirements on capital and margin:

Observations on varying incentives for entities by type of regulatory requirement applicable

Table 8

	Subject to bilateral margin requirements	**Exempt from bilateral margin requirements**
Subject to capital requirements (eg banks or insurance companies) on counterparty risk exposures	Direct clearing: Incentives to clear centrally, created by higher bilateral margin and capital (credit valuation adjustment) costs than CCP margins and capital costs. Indirect clearing: Incentives depend on cost pass-through from the dealer. Incentives to clear centrally may be lower due to reduced multilateral netting benefits and the capital requirements for the clearing member's exposure to its client.	Direct clearing: Incentives to clear centrally depend on relative collateral and capital costs for central clearing versus the capital cost for bilateral trading. Indirect clearing: Incentives depend on cost pass-through from the dealer on bilateral and indirectly cleared trade.
Exempt from capital requirements on counterparty risk exposures	Direct clearing: Incentives to clear centrally created by higher margin requirements for bilateral than for central clearing. Indirect clearing: Incentives depend on cost pass-through from the dealer. Incentives to clear centrally may be lower due to reduced multilateral netting benefits.	Direct clearing: Incentives to clear centrally may not be present in view of margin and capital requirements for central clearing. Indirect clearing: Incentives depend on cost pass-through from the dealer. Incentives to centrally clear may weaken due to capital requirements for a clearing member's exposure to its clients. .

Appendix 1 – Participating institutions and authorities

Chair: Jonas Niemeyer *(Sveriges Riksbank)*

Secretariat support was provided by the Basel Committee on Banking Supervision.

Autorité de Contrôle Prudentiel et de Résolution (France)

Arnaud Sandrin

Bank of Canada

Carol Ann Northcott (formerly with the organization)
Jean-Philippe Dion (formerly with the organization)

Bank of England

Mikael Katz
Paul Nahai-Williamson
Derek Nesbitt
Anne Wetherilt

Bank of France

Nicolas Maggiar
Priscille Schmitz

Deutsche Bundesbank

Waltraud Wende

Federal Reserve Bank of New York

Ning Luo
Kapo Yuen

Federal Reserve Board

Samim Ghamami
Travis Nesmith

Financial Services Agency (Japan)

Ko Nishiuchi

Netherlands Bank

Rien Jeuken

Secretariat to the Committee on Payments and Market Infrastructures

Umar Faruqui
Philippe Troussard

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Anders Rydén