Securing your access

OTC derivatives and central clearing

January 2012

Securing access to clearing services is more than just a procurement exercise. PwC expertise and insight can help you achieve the right result.
Demand for full-service central clearing is likely to exceed supply. Market participants have just a short time to secure access to the clearing services they need before the end-2012 deadline for implementation.
In just over a year from now the OTC derivatives market will move to a system of central clearing, fulfilling the ambitions of the G20 group of leading nations for a better capitalised derivatives’ trading system that reduces systemic risk in the global financial system. For market participants, getting ready for this deadline – whether it slips slightly or not – represents a huge challenge.

With the shape of the regulatory framework now becoming increasingly evident, and brokers’ clearing service propositions taking shape, PwC set out to study how prepared the market is for central clearing and whether its full implications are understood. In doing so, we examined the services market participants had highlighted as key in our ‘Voice of the Customer’ survey, and spoke to leading brokers to validate our views.

What we found was a very uneven state of preparation. While hedge fund managers are familiar with the issues associated with central clearing, other market participants appear to be less advanced in looking into their route to market. Clearing brokers reported receiving standard request for proposal (RFP) type questions that betrayed limited understanding of the key points.

Furthermore, with potentially many thousands of OTC market participants, and only a relatively small number of clearing brokers, demand for available clearing services is likely to exceed supply, especially in the run-up to the regulatory deadline. Brokers have limited appetites for certain types of client and we expect some might find procuring the services they need, challenging.

What this means is that some market participants – probably smaller asset managers or banks – will not be able to access full-service clearing brokers. Instead, we might see the emergence of slimmed-down clearing services. No organisation has yet announced it will offer such a service, but it seems a logical step to take. Such service propositions would naturally cost less to implement, yet would not offer extensive reporting, collateral transformation and liquidity services, for example.

Those market participants that have not started to analyse how they will carry out their investing and hedging strategies need to start now. We outline in this paper the key points to consider when selecting clearing brokers. Failure to do so might result in a suboptimal trade-off between access to central clearing and cost.

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1 ‘PwC’ refers to PricewaterhouseCoopers LLP (a limited liability partnership in the UK), which is a member firm of PricewaterhouseCoopers International Limited, each member firm of which is a separate legal entity

2 PwC, October 2010
2. Key points

This study has identified a number of issues that affect both the provider and user of clearing services, but in different ways. The following summarises the key points.

- As the shape of the new world of central clearing starts to emerge, market participants should review their investment and hedging goals, making sure that the benefits justify the costs associated with clearing. There will be a trade-off between the increased costs of continuing to clear trades bilaterally and opting for central clearing, as bilateral clearing will attract a higher capital charge.

- Market participants’ bargaining positions will vary, depending on how much brokers value their business. They should be aware of their worth to brokers – not only for clearing services but also across the core fixed income and credit franchises, as well as prime brokerage. Approaching brokers early will help participants to achieve the best costs, terms and conditions. That said, traditionally, only a few have been in a position to negotiate other than non-standard terms.

- Look behind the broking organisation. Different brokers dedicate different levels of balance-sheet support to their clearing businesses, and this affects clients’ trading limits. For some brokers, the evolving interplay of US and European regulations might lead to the establishment of new clearing entities, which will be separately capitalised.

- Take a realistic view of operational issues, especially considering it will probably be desirable to have multiple brokers. Look at the instruments and the volume of clearing that will be allocated to each broker, as well as technology platforms and the ease of consolidating reporting. Additionally, evaluate the processes that will need to be in place should a broker become insolvent, and ensure that contracts are in place and all rights and obligations fully understood.

- Bear in mind that clearing brokers might have to take on a large number of clients in a short space of time, leading to administrative bottlenecks. Allow ample time for the ‘on-boarding’ process, and completing all necessary legal reviews.

- Have a contingency plan in case it is not possible to appoint a clearing broker within the timeframe demanded by the new regulations.
The G20 group of nations initiated the move towards central clearing for OTC derivatives in the wake of the financial crisis, seeking to reduce systemic risk in a market that had grown rapidly.

In September 2009, the G20 leaders meeting in Pittsburgh agreed that: “All standardised OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements.”

European and US regulators have a schedule designed to meet this deadline, planning to mandate use of central clearing counterparties (CCPs) for certain products from the end of 2012; however, some believe this deadline might slip to early 2013, or even later. Already, OTC trade is beginning to migrate to the central clearing model. In particular, a number of large hedge funds have started to use CCPs in advance of new regulations.

At the time of writing, the details of regulations are more advanced in the US than in Europe. The regulations are complicated, and need to be harmonised between one jurisdiction and the next to avoid the risk of regulatory arbitrage. In the US, the Dodd-Frank Act will stipulate just how central clearing will work in practice, but its final rules have been delayed by the regulators’ sheer volume of work. In Europe, the European Market Infrastructure Regulation (EMIR) will dictate the detail of central clearing, and is still being worked upon. In Asia, separate initiatives are underway in Hong Kong, Japan and Singapore to develop central clearing models in line with those emerging in Europe and the US.

In the medium term, we expect that central clearing will lead to a surge in volumes and liquidity for standardised contracts, with the size of the market in these areas growing as much as 30% per annum as contract standardisation sparks the emergence of volatility trading. But in the short term, volumes are likely to shrink as market participants adapt to the new market infrastructure. For market participants, the cost of holding a position will rise, due to either the increased capital charge or the costs associated with posting margin with a broker or clearing house. Clearly, there will be a fee for clearing services, but there will also be costs associated with collateral transformation and provision of liquidity. On the plus side, where products have been standardised and are traded on exchanges, or other regulated trading facilities, spreads should become tighter. Evidently, market participants have a lot to think about. As a first step they need to form a view of how the move to central clearing will affect their OTC derivatives trading – then they need to decide what is required from a clearing broker and initiate discussions early.

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### Milestones OTC Clearing in the US and Europe

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2010</td>
<td>Enactment of Dodd-Frank Act</td>
</tr>
<tr>
<td>September 2010</td>
<td>Publication of the European Markets Infrastructure Regulation</td>
</tr>
<tr>
<td>December 2010</td>
<td>Consultation Paper MiFID</td>
</tr>
<tr>
<td>January 2011</td>
<td>Report of the European Central Bank</td>
</tr>
<tr>
<td>February 2011</td>
<td>Consultation Paper of the European Commission</td>
</tr>
<tr>
<td>February 2011</td>
<td>Draft: European Parliament Legislative Resolution (Langen Report)</td>
</tr>
<tr>
<td>May 2011</td>
<td>Adoption: Langen Report; agreed by the Council</td>
</tr>
<tr>
<td>June 2011</td>
<td>Decision of the EU Parliament</td>
</tr>
<tr>
<td>Oct 2011</td>
<td>Compromise on EMIR agreed in ECOFIN Council</td>
</tr>
<tr>
<td>Q1 2012</td>
<td>Resolution in the EU Parliament</td>
</tr>
<tr>
<td>Q2 2012</td>
<td>ESMA draft of regulatory and technical standards</td>
</tr>
<tr>
<td>End of 2012</td>
<td>Clearing becomes mandatory in the US</td>
</tr>
<tr>
<td>End of 2012</td>
<td>Clearing becomes mandatory in Europe</td>
</tr>
<tr>
<td>2015</td>
<td>Review of the regulation and if necessary, enhancement of 'clearing eligible' instrument classes</td>
</tr>
</tbody>
</table>

### Shape and size of the derivatives market

<table>
<thead>
<tr>
<th>Attribute</th>
<th>OTC derivatives</th>
<th>Exchange-traded derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td># Participants</td>
<td>Limited (~30,000)</td>
<td>Expansive (~5,000,000)</td>
</tr>
<tr>
<td>End user types</td>
<td>Inter-dealer brokers (5–20), dealer banks (50–100), other banks (2,000–5,000), other financial and corporations, including securities firms, insurance companies, asset managers, hedge funds and proprietary trading firms (25,000+)</td>
<td>All of the OTC types, plus traditional asset managers and individual investors (~5,000,000)</td>
</tr>
<tr>
<td>Product categories</td>
<td>Swap (single and cross-currency), forward rate agreement (FRA), swaption, basis swap, cap, floor, exotic swap, inflation swap, debt option, exotic option, exotic cross-currency swap</td>
<td>Vanilla options and futures (&gt; 8,000 unique contracts)</td>
</tr>
<tr>
<td>Strategy types</td>
<td>Hedging primary, investment and trading secondary; limited annual turnover range: 1–20x</td>
<td>Investment and trading primary, hedging secondary; broad annual turnover range: 1–100x</td>
</tr>
<tr>
<td>Notional turnover</td>
<td>$1.7 quadrillion (2010)</td>
<td>$2.0 quadrillion (2010)</td>
</tr>
<tr>
<td>Annual transactions</td>
<td>$16,000,000 (2010)</td>
<td>$3 billion (2010)</td>
</tr>
<tr>
<td>Average trade size / value</td>
<td>NA/$105 million (2010)</td>
<td>5.9 contracts/$103,000 (2009)</td>
</tr>
</tbody>
</table>

Source: *The Global Risk Transfer Market, TABB Group Study, 2010*
When evaluating potential clearing brokers, market participants need to investigate a range of specific and general topics, varying from reporting capabilities through to collateral management practices and segregation of assets.

From a practical perspective, there will no doubt be infrastructure changes required and, although efforts will be made to provide standard agreements, many participants will want to take their own view on the agreement they are being asked to sign. Recent experience suggests that the safety and segregation of assets in the event of a default will be key features.

Risk management, segregation of unencumbered assets and the portability of not just positions but also collateral and margin, in the light of recent events, will no doubt be important. For example, the Lehman default highlighted this issue because entities with open positions were able to move their positions to other brokers, but not their collateral and margin. A key question is going to be: How do you ensure that your broker has adequate client money and client asset segregation processes, and that in the event of a default those assets will be returned in a timely manner? But participants should note that there will undoubtedly be a cost associated with higher levels of risk mitigation.

Services offered at an operational level such as reporting to regulators, single point of contact for all asset types and ease of connectivity will all be differentiating factors. But, as many have noted, the most critical factor is going to be what is done to manage and minimise the costs. Clearly, the trading strategy adopted will determine much of this, but collateral optimisation services, cross-asset margining, financing and a forward view of margin requirements could also be key differentiators.

We list below the key factors that should be assessed when evaluating a broker. We have taken into account the opinions of the brokers we spoke to when preparing this report, and those of market users in our buy-side report ‘Voice of a Customer’, as well as our broad experience in this area.

Products and CCPs

When assessing the offering of a clearing broker, it should not matter which CCP services the broker has access to, as this will be a prerequisite for providing clearing services; note that this is true in Europe and the US, but the CCP services offered by brokers in Asia might vary more due to the number of clearing venues potentially available.

As part of identifying requirements, it will be important to identify the CCPs you will want to access through your broker – this will require analysing the CCP offering in terms of the legal and regulatory environment the CCP operates in, its margining methodology, portability, account structure, default waterfall and products cleared. For example, there still are models offered by some CCPs which do not segregate margin (commingling house and client margin in single omnibus accounts). Yet, since we anticipate that access to all of the major CCPs will be offered by the leading clearing brokers, selecting CCPs, while fundamental, should not be a factor in selecting a clearing broker.

Furthermore, regulation is expected to make sure that margining standards between CCPs will be harmonised and there will be no ‘race to the bottom’ from the point of view of risk management. So competition between CCPs should not be a driver for costs. Yet, differences in regulation relating to indirect clearing could affect client’s ability to clear efficiently.

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4 PwC, October 2010
5 ISDA Commentary on Indirect Clearing – Council Text of EMIR, 29 July 2011
**Credit and balance sheet**

The introduction of central clearing reduces counterparty risk, but does not eliminate it. If your broker failed, your cash and collateral could be at risk. The key factor to analyse is the clearing broker’s credit quality and financial strength in the context of the services offered and the associated asset segregation model. Alternatively, as noted above, portability of positions, collateral and margin would be important considerations.

**Transformation and short-term financing**

Many ‘buy-side’ firms view collateral management as a major concern. Typically, these participants have not held assets that a CCP might regard as eligible collateral. Furthermore, they are not used to holding sizeable cash balances to post variation margin.

The collateral eligible for margin in the clearing process varies from CCP to CCP, and market participants should evaluate brokers’ collateral transformation processes. In our ‘buy-side’ survey, participants voiced misgivings about brokers giving fair values for posted collateral (in other words not imposing excessively aggressive ‘haircuts’), and a desire that brokers should be flexible about the type of collateral they would accept. Brokers can apply their own margining rules to transformation services, so you need to understand how these rules will be applied when assessing transformation services.

By offering access to the limited set of collateral eligible for clearing through collateral transformation, brokers are giving an important service, as demand for these instruments will reduce liquidity.

In addition to collateral transformation services, clearing brokers can offer short-term financing of variation margin. Because this service requires brokers to commit their own balance sheets for clearing, you need to understand the costs and the limits associated with this commitment.

We believe that market participants need to review the following points relating to collateral management and margin financing when evaluating a broker:

- What collateral transformation services will a broker offer you, and how will the broker’s own risk limits affect the level of transformation and financing it can give you?
- How will the new regulations requiring central clearing increase the demand for assets deemed eligible collateral, and how will this affect your access to collateral?
- How will posting daily variation margin – as all CCPs require – affect your liquidity management, and how can your clearing broker help through short-term financing?
- How robust a counterparty is your broker and how is your counterparty risk affected by the service provided?
- Are margin calculations standardised and transparent?
**Omnibus account model**

**Tri-party custodian model**

**Insolvency – remote vehicle model**

Agreement is between the Prime broker and the client, which includes rehypothecation limits on the assets that can be used by the broker.

In addition to the prime brokerage agreement, the client has an agreement with the third party custodian and instructs the excess assets not available for rehypothecation to the custodian from the Prime Broker.

In addition to the prime brokerage agreement, the client has an agreement with the insolvency -remote vehicle. The vehicle is regulated and independently capitalised and holds the segregated client assets.

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### Asset segregation

Following the Lehman and MF Global insolvencies, making sure that assets are adequately segregated is a key consideration when selecting a clearing broker. CCPs segregate collateral, but while some split out individual clients’ assets, others only segregate client assets by clearing broker. Each broker supports several CCPs and offers one or more of these options (note that we do not analyse the CCP asset segregation options in this paper, but Appendix A offers an overview of CCPs).

In addition to the segregation model offered at the CCP, you should understand the asset segregation options offered by clearing brokers themselves for collateral transformation, or when clients are holding excess margin with their brokers. Prime brokers’ asset segregation models give a good guide as to what will be available. They commonly include segregated omnibus accounts at custodians, and individually segregated accounts under tri-party agreements with external custodians. Insolvency-remote vehicles are also an option, although they are not so commonly used.

The main exposure that clients have under the collateral transformation is that they could be in a situation where they have posted collateral that has significantly more value than the collateral that is posted on their behalf to the CCPs by their broker (because of the haircut applied), and in all likelihood this collateral will be rehypothecated by the broker. In this specific scenario, there are no unencumbered assets to segregate under one of the schemes above, and in the case of insolvency the client would not have easy access to these assets. Note that there is a trade-off associated with this scenario as the client would benefit from lower financing costs.

Finally, the ‘Client Money’ regulatory regime governs the segregation of cash. Market participants looking to clear should assess the trade-offs associated with opting out of ‘Client Money’ protection and benefiting from lower financing costs, when selecting clearing brokers.

All of the asset segregation options mentioned above might be offered, with each commanding a different price. When selecting clearing brokers, you should compare equivalent asset segregation models to get an accurate view of the cost and risks associated with each option. Your selected segregation model also needs to be taken into account when evaluating your counterparty risk; you could theoretically have a multi-broker model where there are different segregation levels at each broker.

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6 Through the use of a title transfer collateral agreement
Cross-asset clearing and netting considerations

As part of the selection process, market participants need to evaluate the level of netting and margin optimisation they will be able to achieve. In our 2010 buy-side survey, participants identified cross-product margining as a means of containing costs and reducing overall margin requirements. You should do this through modelling of portfolios.

As noted above, there is a trade-off between the degree of asset segregation, and the scope for cross-asset clearing and netting. The more assets are segregated, the less scope there is for netting and optimising margin. (Assuming the buy-side entity has a mix of both centrally cleared and bilaterally cleared products, there would also be options to take advantage of opportunities to net off margin requirements.)

We outline our theoretical view of a cross-asset collateral management model below.

It would be desirable to model the netting opportunities as part of the selection process to understand how margin might be optimised and this modelling should take into account netting across multiple brokers. In a multi-broker model, you might have scenarios where the level of netting would differ. So when managing clearing operations on an ongoing basis, you would need to allocate clearing transactions to each broker in a manner that would minimise margin requirements and reduce costs.
Portability

Portability of positions, cash and collateral is important for market participants seeking to protect themselves against the possibility of a clearing broker failing. While not all respondents in our 2010 survey highlighted this point, interestingly, those affected directly by high-profile defaults regarded this as significant. Portability of positions alone is not helpful as it will be necessary to fund additional initial and variation margin with your alternative broker (if margin posted with the defaulting clearing broker is trapped in lengthy insolvency proceedings). To guard against this, you might wish to have agreements with multiple-clearing brokers, stipulating that surviving clearing broker(s) will take all open positions in the event of a default. This can only work if CCPs fully segregate client accounts and margin is posted on a gross basis.

Service quality

The broad area of service quality makes a significant difference to maintaining a productive relationship between the client and their clearing service provider. In particular, well-trained staff who can talk knowledgeably about the whole portfolio and deal with operational issues such as reconciliation breaks in a timely and effective manner, is a key differentiator. Errors and operational problems give rise to increased overheads.

The operational robustness of the broker needs to be considered in line with the expected volume of transactions that will go through the broker’s infrastructure as does the level of staff dedicated to clearing. Note that while some transaction flows will be implemented on new infrastructure, there will be a significant amount that leverages the broker’s existing infrastructure for its own cleared transactions and this can be leveraged to assess the overall operational robustness of the broker.

In our buy-side survey, participants also highlighted several general attributes they required from brokers. They thought brokers should organise themselves on cross-product lines, mirroring the structure of buy-side firms, so giving single points of contact and fostering efficiency. They also wanted to have confidence that the broker would innovate, so bringing opportunities for greater efficiency as regulations matured.

The broker’s ability to respond and adapt to the changing environment is an important element of service quality. Over time, regulations will change, as will the CCPs’ offerings. Judging a broker’s ability to execute ‘change’ projects and to deliver benefits from these developments is hard to quantify, but you should make sure this is at the heart of the selection process. Making such a judgement will require extracting ‘proxy’ metrics (e.g. team size, size of existing fixed income franchise) from your RFP response.

You should also look into service quality in a multi-broker environment, which might leverage additional services’ providers to present a holistic view of clearing. For example, our buy-side survey participants wanted to be able to make single payments for margin requirements across their entire portfolios.

General considerations

Apart from the considerations specific to derivatives’ clearing, you need to look into your broker’s overall product offering and financial strength. The broker’s governance and risk management is also important. How strong is your broker’s risk management? Does it have a varied/low risk portfolio of clients? How strong are the broker’s operational controls? Does the broker have an independent, third-party assurance report testifying to the quality of their operational controls (e.g. SAS 70, ISAE 3402, ISAE 3000)?
5. What market participants should do now

Users of OTC derivatives have little time left to prepare for the incoming central clearing regime. They should act swiftly to review how the market is likely to change, and how they will have to adapt to continue achieving your desired investment and hedging objectives. The change in market structure might mean that the benefits of current trading strategies no longer justify the costs.

Some OTC users might decide the cost of becoming a direct clearing member is justified. For example, there has been an increase in the number of direct clearing members in LCH's SwapClear interest rate swap clearing service.

While many have already embarked on securing access to clearing services, there is only 12 months until the OTC market moves to central clearing, and brokers have limited capacity.
# Appendix A: Summary of major CCPs

<table>
<thead>
<tr>
<th>Central counterparty</th>
<th>LCH</th>
<th>CME Group</th>
<th>CME Clearing Europe</th>
<th>ICE Trust</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product region</strong></td>
<td>Global</td>
<td>Global</td>
<td>Europe</td>
<td>North America</td>
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<tr>
<td><strong>Product coverage</strong></td>
<td>Interest rate Swaps ('IRS')</td>
<td>Interest rate Swaps ('IRS') Credit Default Swaps ('CDS')</td>
<td>Interest rate Swaps ('IRS') Credit Default Swaps ('CDS')</td>
<td>North American Index Credit Default Swaps ('CDS')</td>
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<tr>
<td><strong>Eligible collateral</strong></td>
<td>Cash</td>
<td>Cash</td>
<td>Cash</td>
<td>Cash</td>
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<tr>
<td></td>
<td>UK treasury bills and sterling Certificate of Deposits ('CD')</td>
<td>Gold</td>
<td>US Treasury bills, notes and bonds</td>
<td>US Government Treasuries</td>
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<tr>
<td></td>
<td>UK Gilts</td>
<td>Foreign Sovereign Debt</td>
<td>Government Debt</td>
<td>Sovereign Debt</td>
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<td></td>
<td>Performance bonds</td>
<td>U.S. Treasuries and Government Agencies</td>
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<td>Bank issued Letters of Credit ('LoC')</td>
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<tr>
<td></td>
<td>USD cash and USD denominated securities for Swapclear FCM</td>
<td>Select mortgage backed securities</td>
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<tr>
<td></td>
<td>Government Bonds issued in USD by FHLB, FNMA and FHLMC</td>
<td>Specialised collateral programs</td>
<td></td>
<td>Money Market and Mutual Funds ('MMMFs')</td>
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<tr>
<td></td>
<td>Government Guaranteed Bonds and CDs</td>
<td>Bank issued Letters of Credit ('LoC')</td>
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<td></td>
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<td></td>
<td>Foreign Government Treasury bills and Government bonds</td>
<td>Stock : S&amp;P 500 Index</td>
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<td></td>
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<td>Security Deposit</td>
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<td></td>
<td>Temporary Liquidity Guarantee Program ('TLGP') Securities</td>
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<td></td>
<td>Approved Money Market and Mutual Funds ('MMMF')</td>
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<tr>
<td><strong>Initial Margin (IM) Methodology</strong></td>
<td>SPAN algorithm</td>
<td>Historical Value at Risk ('VaR') Model</td>
<td>CME SPAN algorithm</td>
<td>ICE Trust SPAN algorithm</td>
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<td></td>
<td>Portfolio Approach to Interest Rate Scenarios ('PAIRS')</td>
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<td></td>
<td>Equity Risk Analysis for EquityClear</td>
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</tr>
<tr>
<td><strong>Daily margin calls</strong></td>
<td>There are 7 intra-day calculations run hourly.</td>
<td>Twice daily at noon GMT and midnight GMT</td>
<td>Twice daily at noon GMT and midnight GMT</td>
<td>Overnight calculation of margin requirement, published by 4am EST with payments due no later than 10am EST.</td>
</tr>
<tr>
<td><strong>Client margin segregation</strong></td>
<td>Customer margin segregated from house margin on a net or gross basis</td>
<td>Customer margin segregated from house margin on a gross basis.</td>
<td>Customer margin segregated from house margin on a net or gross basis or held in a customer omnibus account.</td>
<td>Customer margin segregated through a customer omnibus account.</td>
</tr>
<tr>
<td>Central counterparty</td>
<td>ICE Clear Europe</td>
<td>NASDAQ OMX</td>
<td>SGX Derivatives Clearing</td>
<td>Eurex Clearing AG</td>
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<tr>
<td>Product region</td>
<td>Europe</td>
<td>Global</td>
<td>Asia</td>
<td>Europe</td>
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<td>Product coverage</td>
<td>Credit Default Swaps ('CDS')</td>
<td>Equity derivatives</td>
<td>Interest Rate Swaps ('IRS')</td>
<td>Interest Rate Swaps ('IRS')</td>
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<td>Short-, medium- and long-term interest rate products</td>
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<td>Credit Default Swaps ('CDS')</td>
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<tr>
<td>Eligible collateral</td>
<td>• Cash</td>
<td>• Cash</td>
<td>• Cash</td>
<td>• Cash</td>
</tr>
<tr>
<td></td>
<td>• Gold Bullion</td>
<td>• Guarantees issued by a bank in favour of a Clearing Member</td>
<td>• Government securities</td>
<td>• Fixed income in euro and other foreign currencies</td>
</tr>
<tr>
<td></td>
<td>• Certificate of Deposit ('CD')</td>
<td>• Letters of Credit ('LoC')</td>
<td>• Selected common stocks</td>
<td>• Equities</td>
</tr>
<tr>
<td></td>
<td>• Letters of Credit ('LoC')</td>
<td>• Commercial paper issued by domestic banks or mortgage institutions</td>
<td>• Bank Certificates of Deposit ('CD')</td>
<td>• Fixed income in CHF</td>
</tr>
<tr>
<td></td>
<td>• Triparty Collateral</td>
<td>• Bonds issued by banks or mortgage institutions</td>
<td>• Gold bars</td>
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<tr>
<td></td>
<td>• Cross Currencies</td>
<td>• Domestic Commercial bank Certificates of Deposit ('CD')</td>
<td>Gold certificates</td>
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<td></td>
<td>• UK Gilts and Treasuries</td>
<td>• Shares listed on NASDAQ OMX Nordic/Oslo Børs main list</td>
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<tr>
<td></td>
<td>• US Bonds and Treasuries</td>
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<td>• Foreign Government Treasuries</td>
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<td>Initial Margin ('IM') Methodology</td>
<td>ICE Clear SPAN 4 algorithm.</td>
<td>Risk Valuation ('RIVA') and RIVA Capital at Risk ('RCaR') models.</td>
<td>Value at Risk Model ('RV') applied to calculate IM.</td>
<td>Prisma Methodology for IRS ('Portfolio Risk Management Methodology')</td>
</tr>
<tr>
<td>Daily margin calls</td>
<td>Margin requirements published by 2am GMT and payments due no later than 9am GMT.</td>
<td>Daily margin call end-of-day with margin required at 11am CET the following day.</td>
<td>Twice daily at 12:00 and 16:00 Singapore time.</td>
<td>Overnight 8am CET for EUR and 9amCET for CHF and intra-day margin issued if clearing member exceeds threshold.</td>
</tr>
<tr>
<td>Client margin segregation</td>
<td>Customer margin segregated through a customer omnibus account.</td>
<td>Customer margin segregated from house margin on a net or gross basis or held in a customer omnibus account.</td>
<td>Customer margin segregated from house margin on a gross basis.</td>
<td>Customer margin segregated from house margin on a gross basis in individual accounts or held comingled in an omnibus account.</td>
</tr>
</tbody>
</table>

Source: PwC analysis, 2011
While the new central clearing regime will lead to the vast majority of OTC trades migrating to a central clearing model, there will effectively be two clearing models.

1. Central clearing

Under this model, which will become the most common under the new rules, the central counterparty (CCP) clearing house performs the role of buyer to every seller and seller to every buyer. Asset managers, banks and hedge funds access the market and CCP through their clearing brokers, or by becoming Direct Clearing Members of the CCP (which requires a significant commitment of capital). The CCP performs the vital role of managing credit, market and settlement risk.

Derivatives’ users pay their clearing brokers both initial (amount required to be collateralised in order to open a position) and variation margins (payment that is made by clearing members to their respective clearing houses, based upon adverse price movements of the contracts that these members hold) to cover the risk on their open positions. The clearing broker then pays margin on to the CCP.

By holding margin and managing risk in this way, the CCP becomes a buffer against systemic risk. If a market participant defaults, the CCP can close its positions in an orderly fashion. Additionally, by intermediating between buyers and sellers, a CCP increases market transparency.

2. Bilateral structure

OTC market participants have historically conducted trades just with each other – and they will continue to execute non-standardised contracts that regulators deem unsuitable for central clearing in this way.

Participants do not always post margin / collateral. So if one party defaults, the non-defaulting party becomes a general creditor to the estate of the defaulter. In a complex insolvency, this could mean waiting years for a payout on the debt.
Appendix C:
List of useful websites

PwC http://www.pwc.co.uk
LCH.Clearnet http://www.lchclearnet.com/
CME Group http://www.cmegroup.com/clearing/
CME Clearing Europe http://www.cmeclearingeurope.com/
ICE Trust https://www.theice.com/clear_overview.jhtml
ICE Clearing Europe https://www.theice.com/clear_europe.jhtml
NASDAQ OMX http://www.nasdaqomx.com/
SGX Derivatives Clearing http://www.sgx.com/
IDCG http://idcg.com/
NYSE Liffe Clearing http://globalderivatives.nyx.com/clearing/nyse-liffe
AIMA http://www.aima.org/

Source: PwC analysis, 2011
Appendix D: Acknowledgements

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