CLEARING HOUSE FUNCTIONS – EXCHANGE TRADED DERIVATIVES
ABSTRACT

This paper outlines various functions performed by clearing house in the area of Exchange Traded Derivatives. Functions include clearing and settlement. EUREX CLEARING has been taken as base and the functions, rules and regulations are explained.

It also outlines the benefits of clearing and settlement through clearing houses and lists various clearing houses around the world.
# TABLE OF CONTENTS

1 INTRODUCTION ........................................................................................................... 4

2 STRUCTURE OF CLEARING AND SETTLEMENT ..................................................... 5
   2.1 GENERAL ASPECTS OF CLEARING HOUSE ................................................. 5
   2.2 CLEARING STRUCTURE ................................................................................ 5

3 CLEARING ................................................................................................................... 7
   3.1 TRADE MANAGEMENT - GIVE UP & TAKE UP ............................................. 7
   3.2 POSITION MANAGEMENT ............................................................................. 7
   3.3 POSITION LIMITS ........................................................................................... 8
   3.4 POSITION TRANSFER .................................................................................... 8
   3.5 EXERCISE/ASSIGNMENT OF OPTIONS ....................................................... 8
   3.6 RISK MANAGEMENT ....................................................................................... 9
       3.6.1 OVERVIEW .............................................................................................. 9
       3.6.2 MARGINING .......................................................................................... 10
           3.6.2.1 INTRADAY AND END OF DAY MARGINING ................................... 11
           3.6.2.2 TYPES OF MARGINS .................................................................. 11
   3.7 COLLATERAL MANAGEMENT .................................................................... 13
       3.7.1 DEPOSITING COLLATERAL ................................................................ 13
       3.7.2 ACCEPTABLE COLLATERAL ................................................................ 14
       3.7.3 CAPITAL REQUIREMENTS .................................................................... 15
       3.7.4 CLEARING FUND ................................................................................... 16

4 SETTLEMENT .............................................................................................................. 17
   4.1 PHYSICAL SETTLEMENT ............................................................................. 18
   4.2 CASH SETTLEMENT .................................................................................... 24
       4.2.1 MARK TO MARKET SETTLEMENT ............................................................. 24
       4.2.2 PREMIUM SETTLEMENT ..................................................................... 24

5 REPORTS .................................................................................................................... 25

6 APPENDIX ................................................................................................................ 26

7 REFERENCES .......................................................................................................... 28
1 INTRODUCTION

Exchange-traded derivatives (ETD) are those derivatives products that are traded in stock exchanges. Clearing House acts as an intermediary to all related transactions, and takes Initial margin from both sides of the trade to act as a guarantee. The world's largest derivatives exchanges (by number of transactions) are the Korea Exchange, Eurex, and CME Group.

Clearing House protects the financial integrity of markets by serving as the counterparty to every transaction and virtually eliminating credit risk. It is responsible for settling trading accounts, clearing trades, collecting and maintaining collateral funds, regulating delivery and reporting trading data. The financial integrity of futures and options markets depends on the robustness of their arrangements for clearing and settling trades.

The clearing and settlement of derivatives transactions are very different from those for securities. Rather than clearing and settling in a few days, derivatives contracts often remain outstanding for several months or years. Unlike securities where the security itself is delivered and promptly paid for in full, derivatives contracts represent the obligation to buy or sell a financial instrument at a future date, with buyer and seller assuming significant financial risk to the CCP in the interim. Whereas the CCP's guarantee lasts only a few days for securities, the CCP revalues exchange-traded derivatives contracts daily and requires market participants to continue to settle with the CCP every day until the derivatives contracts are liquidated, exercised, or mature.

Derivatives clearing systems have far more complex risk management, margining, and collateral management systems as compared to Securities clearing. Similar to securities clearing systems, derivatives clearing organizations novate trades, substituting the CCP as the counterparty acting as seller to buyer and buyer to seller, creating two new contracts. Novation also allows the liquidation of derivatives contracts prior to maturity, a concept very different from that of clearing securities transactions. In all clearing systems, the number of buyers must always equal the number of sellers. Novation allows market participants to enter and leave the marketplace while keeping the number of buyers (longs) and sellers (shorts) equal at any point in time.

Besides providing risk management, margining, and collateral management practices to organized derivatives markets, the CCPs' intermediation provides other, more subtle benefits. For example, the substitution of the CCP as the central guarantor of performance allows trading on organized securities and derivatives markets to occur anonymously. If one benefit of anonymity is increased market liquidity, this in turn leads to more efficient price discovery and trade execution.

To protect itself from a potential financial loss as the result of liquidating the positions of a defaulting clearing participant, the CCP also requires all clearing participants to deposit performance collateral. The process of revaluing all derivatives contracts to market prices (marking-to-market), collecting incremental unrealized losses, and passing the value of the incremental unrealized profits to firms with a credit balance with the CCP, replenishes the value of the performance collateral that the CCP holds for all positions. Thus, in most cases, CCPs set their performance collateral requirements at levels that would be expected to cover one day's market move.
2 STRUCTURE OF CLEARING AND SETTLEMENT

2.1 GENERAL ASPECTS OF CLEARING HOUSE

A derivatives clearing house may be a department within the exchange for which it clears or an independent legal entity. If organized as an independent legal entity, the clearing house is typically owned by the exchange for which it clears or by its clearing members. Historically, a derivatives exchange was typically owned by its members (primarily brokers, banks, investment companies and insurance companies). The members were also generally the exchange’s largest users.

When a trade is executed, Clearing House stands between the buyer and seller as counterparty of both contractual partners. The Clearing House enables the parties of the transaction to make further decisions fully independent of each other and limit counterparty risks to a single contractual partner.

2.2 CLEARING STRUCTURE

The derivatives clearing house restricts direct participation in the clearing process to the most creditworthy subset of the exchange’s members; these are those clearing members that have a principal relationship with the clearing house in its capacity as central counterparty for all contracts submitted and accepted for clearing. Market participants that are not clearing members must establish an account relationship directly or through another party (a non-clearing broker) with a clearing member to effect settlement. Generally, there is no contractual relationship between the derivatives clearing house and these non clearing member market participants.

Only a market participant which has been admitted as a Clearing Member may be a counterparty of Eurex Clearing AG. Companies may become General Clearing Members (GCM) or Direct Clearing Members (DCM) of Eurex Clearing AG and may apply for one or more Clearing Licenses.

A General Clearing Member (GCM) may settle its own transactions, those of its customers, as well as those of market participants which do not hold a clearing license (Non Clearing Members – NCM). A Direct Clearing Member (DCM) is entitled to clear only its own transactions, those of its customers, and those of its corporate affiliates which do not hold a clearing license.
If a market participant does not itself hold a Clearing License, it must clear its transactions via a GCM or a company-affiliated DCM. In such cases, the contractual party of the Non-Clearing Member (NCM) will not be the clearing house, but rather the GCM or company-affiliated DCM, which in turn is the contractual party of the Clearing House.

Each Clearing Member is obliged to demand from its customers and NCMs margin amounts which are at least as high as the levels that result from the clearing house method of calculation.
3 CLEARING

3.1 TRADE MANAGEMENT - GIVE UP & TAKE UP

The give-up functionality allows Members to transfer trades to other Members. The receiving Clearing Member is required to accept or reject the give-up. Only transactions originated on the trading day (current give-up) or the previous business day (historical give-up) may be designated. The acceptance of transferred trades is called take-up.

GCMs have to accept the give-ups of their NCMs to Clearing House. Acceptance must occur on the same day the give-up transaction takes place. Give-up and take-up Clearing Members have the possibility to inquire (pending) trades that are designated for give-up or take-up.

After a trade has been given up to another Member, it will not be transferred until the give-up Clearing Member has accepted the give-up and until the appointed take-up Exchange Member and its Clearing Member accepts or "takes up" the trade.

3.2 POSITION MANAGEMENT

Individual trades are aggregated at each derivatives contract level to reflect positions in individual accounts. Net position is calculated as sum of all long trades netted against sum of all short trades. Net position is either LONG or SHORT at each contract level. Positions are calculated at each client of the clearing member that includes proprietary account of the clearing member, clients of the clearing member and the Non Trading Member (NCM) who is clearing through the clearing member.

Positions are maintained separately for proprietary trades and client trades. In some of the clearing houses positions are maintained for market maker trades.

Principal Position Account

It is called proprietary account i.e. clearing member’s own account. All trades executed on behalf of their own proprietary by the clearing member will be aggregated to LONG and SHORT positions. Net position is calculated at each derivatives contract level by netting of long position against short position and net position is carried forward to next exchange day as either long or short.

For example in EUREX clearing, clearing member can have two principal position accounts with the clearing house.

Long position in one contract holding by the principal position account one can not be netted off against the short position on the same contract holding by another principal position account.
**Agent Position Account**

It is also called clearing member’s client account. There is a separate account at each client who is clearing through the clearing member. All traded executed by clearing member on behalf of their clients are netted off and net position is calculated at each client account level for a particular derivatives contract.

Long position in one contract holding by the client position account can not be netted off against the short position on the same contract holding by another client position account.

**Market Maker Position Account**

Trades that are resulted from market maker activities by the clearing member considered for position maintenance in a separate account called market maker position account. These trades may be transferred to either agent position account or principal position account depending upon the client orders to fill the trades. In some of the clearing houses like EUREX clearing, clearing member can have two market maker position accounts.

Long position in one contract holding by the position account one can be netted off against the short position on the same contract holding by another position account.

**3.3 POSITION LIMITS**

A position limit is a maximum number of contracts that may be held by one Exchange Participant for its own account or by one of its customer alone or in cooperation with others. Position limits are related to products; they are not related to the financial soundness of individual Exchange Participants.

If a position limit is exceeded pursuant to aforementioned provisions, the Exchange participant is obligated to immediately reduce the respective position to the limit. The Exchange participant undertakes to obtain the consent of its customer, in case such consent is necessary. In case position limit is violated, penalty will be charged to the clearing member by the clearing house and may be the trading activity will be suspended till the time position is reduced to the limit.

**3.4 POSITION TRANSFER**

Position can be transferred both within the Clearing Member and between Clearing Members.

Clearing Members can transfer positions between their accounts. The transfers can take place only between agent and proprietary accounts. Position account transfers are possible during the Pre-Trading Period, Opening Period, Trading Period and the Post-Trading Full Period. Exercised or assigned positions cannot be transferred.

In addition, position transfers between different Members (not Market Maker positions) are allowed from Pre-Trading until the end of the Post-Trading Full Period. However, the actual adjustment is performed in the pre-batch assignment process or during batch processing. Partial position transfers on futures or option products will be executed with previous day's settlement price. This is done, irrespective of whether the transferred positions result from trades of the previous business day or the current business day.

**3.5 EXERCISE/ASSIGNMENT OF OPTIONS**

**AUTOMATIC EXERCISE**

With the automatic exercise facility a Member is able to define individually the minimum in-the-money amount, so that every open option product with a defined minimum in-the-money amount may be exercised automatically on expiration day. The minimum in-the-money amount is defined per product and per client account and can be an absolute value or a percentage. An automatic exercise is prevented by setting the high value of 99,999.99 for all products and accounts, i.e. this is the default value and an exercise has to be performed manually by the Member. Additionally, individual option positions can be excluded from automatic exercise by the Member.
MANUAL EXERCISE
In addition to the automatic exercise functionality, the Member can still exercise options manually at any time. In exceptional cases exercise requests can also be entered by the Clearing House on behalf of the Member. Members can exercise their long positions in an option series totally or partially. Adjustments of exercises on the same day are still possible. A fee is charged for exercises.

ASSIGNMENT
All exercises are randomly assigned to the writers of the exercised option series during the daily pre-batch assignment procedure. In contrast to European style options, American style option exercises can be assigned to the writers of options during the entire life of the options contract. Assignments are binding for the holders of short positions.

For example in EUREX clearing, physical deliveries and cash payments that arise from exercise and assignment should be settled on second exchange day from the date of exercising the option.

3.6 RISK MANAGEMENT

3.6.1 OVERVIEW
As a central counterparty to its clearing members, a derivatives clearing house assumes a variety of risks which must be managed. More specifically, the clearing house must have adequate risk management measures in place to cover

A. Default of a clearing member
B. Default of a settlement bank and
C. Number of other risks.

A) DEFAULTS OF CLEARING MEMBERS
The defaults of clearing members on their outstanding contracts may expose the clearing house to principal (delivery) risk, replacement cost risk and liquidity risk.

Principal Risk
Can occur if contracts are settled through delivery of the underlying commodity or instrument. For example, if a commodity or underlying instrument is delivered prior to receipt of payment, the deliverer risks losing its full value. If payment is made prior to delivery, the payer risks losing the full value of the payment.

Replacement Cost Risk
The clearing house has an obligation to the clearing member on the other side of the contract, so that it must take a position identical to that on which the clearing member has defaulted. However, as time passes after the default, market prices will tend to move away from the level that existed at the time the defaulting clearing member last posted margin to cover its obligations under the contract. As a result, the obligations of the clearing house may fluctuate from the time of the default until the clearing house covers and closes out the position.

Liquidity Risk
Clearing house must fulfill its payment obligations without delay even if one or more members default or their performance of their settlement obligations is delayed. This is particularly critical because, owing to the central counterparty’s central position, any doubts about its ability to conclude settlement may create systemic disturbances.

B) SETTLEMENT BANK FAILURES
If clearing houses effect money settlements through private settlement banks, they are exposed to the risk of settlement bank failure. Such failures could expose a clearing house to both credit risk and liquidity risk.
C) OTHER RISKS TO WHICH THE DERIVATIVES CLEARING HOUSES MAY BE EXPOSED

Market Risk:
A clearing house may be subject to market risk if it accepts securities as margin. Clearing houses usually address this market risk by discounting the value of non-domestic currencies and securities posted as margin (i.e. by subjecting them to “haircuts”) and by marking them to market daily.

Currency Exchange Risk
If the clearing house accepts non-domestic currency as margin or if it clears contracts that are denominated and settled in a non-domestic currency, but that are collateralised with domestic currency or assets denominated in domestic currency. Clearing houses usually address this risk by subjecting non-domestic currency and assets denominated in non-domestic currency to haircuts and by marking all assets to market daily.

Operational risk:
Any operational problem that delays settlement or prevents the clearing house from resolving a default could increase counterparty exposures. In addition, an operational breakdown might prevent a clearing house from monitoring its exposures.

Legal risks:
The enforceability of netting arrangements, the ability to realize a defaulting member’s assets, the finality of payments and securities transfers, the enforceability of the clearing house’s internal rules and the general legal framework applicable in the jurisdiction in which the clearing house operates must be subject to a high degree of legal certainty.

RISK MANAGEMENT PROCEDURES OF CLEARING HOUSE

- Imposition of membership requirements, including capital requirements, and an ongoing monitoring of compliance with such requirements in order to limit the likelihood of defaults;

- Imposition of security deposit, collateral requirements and exposure ceilings to limit loss by using more than one settlement bank. Another technique to minimize the risk of settlement bank failure is to convert customer cash held in deposits at the settlement bank into securities, e.g. Treasury bonds, held by the settlement bank. While a cash deposit account creates a debtor/creditor relationship between the bank and its customer for the amount on deposit and a customer claim against the assets of the bank in the event of its insolvency, customer securities held by a settlement bank are segregated for the benefit of the customer on its books, are not included in its assets upon its insolvency and can be recovered by the customer free of any claims against the bank.

3.6.2 MARGINING
Margining process is a complex and time critical process that takes into account a variety of factors in order to calculate margins that adequately protect the marketplace, while simultaneously setting appropriate levels that do not tie up excess capital.

In order to protect themselves against the risks emerging from a clearing member’s default, clearing houses typically apply a range of risk management procedures. In particular, every clearing member must post an initial amount with the clearing house as margin (initial margin) upon the creation of a position. The margin necessary to secure each position is then recalculated at least once a day and, at many exchanges, more often per day, with any additionally required margin (maintenance margin) having to be paid accordingly.

Margin is defined as the funds or securities which must be deposited by Clearing Members as collateral for a given position. Margining encompasses the entire process of measuring, calculating and administering the collateral that must be put up for coverage of open positions. The provision of collateral is intended to ensure that all financial commitments related to the open positions of a Clearing Member can be offset within a very short period of time.
3.6.2.1 INTRADAY AND END OF DAY MARGINING
Intra-day margining is an important feature as it directly reduces the counterparty credit risk of the CCP. The intra-day margin call allows to quickly respond to increased price volatility or the growing positions of Members which in turn allows to take action to lower the exposure to the CCP. The intra-day margin call also allows us to take into account day trading clients.

Advantages of Intra day margin process includes:

- Real time position updates
- Intra-day risk evaluation for positions using current underlying prices/volatilities
- Information to allow forecasts of overnight requirements for cash and collateral management
- Risk reports that are delivered at regular intervals.
- The possibility to break down margin requirements on customer and margin class level

End of Day margining is the batch process of computing the margins at the end of trading day based on final positions taken by clearing members. Based on margin requirements and collateral valuation, margin calls are made to clearing members by clearing house in case of collateral is insufficient to adjust the margin requirements.

3.6.2.2 TYPES OF MARGINS
- Premium Margin
- Variation Margin
- Additional Margin
- Futures Spread Margin
- Delivery Margin

PREMIUM MARGIN
For Option Contracts
Premium margin must be deposited by the writer of an option. The premium margin is continuously adjusted, i.e. if prices fluctuate so that the potential loss upon liquidation increases, the writer will be obliged to deposit additional premium margin. If on the other hand, prices fluctuate so that the potential loss upon liquidation decreases, the writer will receive a credit for
his premium margin. The purchaser of a traditional option need not deposit any margin because, with the payment of the options premium, he acquires a right but not an obligation to take any further action. His maximum close-out risk simply amounts to a total loss of the options premium if the contract is allowed to expire without having been exercised or sold in a closing transaction.

For Options On Futures Contracts
No premium margin is required because here a daily profit and loss adjustment (variation margin) is made by the procedure known as “marking-to-market”. The profit of one party to the contract is the loss of the other party. The resulting gains and losses are either debited or credited to the appropriate account on a daily basis via the mark-to-market process.

VARIATION MARGIN
Marking-to-market (MTM) is carried out on futures and options on futures. Using variation margin, profits and losses that arise due to the price fluctuations of open positions are offset daily. All MTM profits and losses are cash settled everyday. With the mark-to-market procedure, the owner of a long position which was purchased at a lower price than the daily settlement price is credited with the difference between the two prices, whereas the owner of the related short position must pay that difference. When options positions are marked-to-market, calculation of the appropriate credits and debits depends on how the value of a call or put position changed during the trading day.

The mark-to-market procedure ensures that each position is revalued at the daily settlement price. The difference between today’s and the previous day’s settlement price is offset by daily compensating payments.

ADDITIONAL MARGIN
Additional margin serves to cover through the next trading any potential additional costs that could arise if the positions had to be liquidated immediately. These possible close-out costs would arise if, based on the current prices of contracts/securities held in an account, the worst case loss would occur during the subsequent trading day. Additional margin is imposed on options (also options on futures), non-spread futures positions, as well as equities.

FUTURES SPREAD MARGIN (INITIAL MARGIN)
A futures spread position usually involves the simultaneous buying and selling of two different contract months within the same commodity. The combined long and short futures positions on a given commodity product is called a futures spread. In a futures spread, you are trading a closer futures contract against a farther out futures contract. This strategy is also known as a calendar spread. If an account holds a number of futures positions that are based on the same underlying instrument, then the long and short positions can be offset against each other as long as they have the same maturity (“netting of positions”). In such a case, the price risks are equal and opposite. Only those long or short positions remain which have expiration dates that are not identical. These positions can also be offset against each other (spreading) because the associated risks roughly offset each other, e.g. a long futures contract with expiry month as September versus a short future contract with expiry month as December of the same underlying. Counterbalanced positions of this kind are called “spreads”, and those which are not are referred to as “non-spreads”.

However, a latent risk still exists, one arising from the fact that contracts with differing expiration dates do not demonstrate a perfect price correlation. The purpose of futures spread margin is to cover this risk until the next trading day. Most of the clearing houses around the world use SPAN methodology for calculating futures spread margin. This margin is part of initial margin.

The SPAN® method considers not only futures contracts and options on futures contracts but also other types of options. It estimates in a uniform manner all products having the same underlying instrument thus taking an overall view of the portfolio composed of options and futures contracts.
Portfolio based margining methodology is used for initial margin calculation using a completely automated interface with SPAN. Positions are loaded into SPAN along with the risk array files to compute margin requirement. Output from the SPAN gives the Initial Margin (IM) as

\[
IM = \text{SPAN Margin} - \text{LOV} + \text{SOV} \quad \text{(If LOV benefit is available)}
\]

If the LOV benefit is not applicable, with the span engine output SOV, for a particular security, IM is computed as

\[
IM = \text{SPAN Margin} + \text{SOV} \quad \text{(If LOV benefit is NA)}
\]

Where,

- \text{SPAN} = \text{Standard Portfolio Analysis of Risk}
- \text{NOV} = \text{Net Option Value}
- \text{LOV} = \text{Long Option Value}
- \text{SOV} = \text{Short Option Value}

**Risk arrays**
The SPAN® method is based on the estimation of the balance liquidation value of a portfolio according to several scenarios representing changes in market conditions. This data is stored in risk arrays which are specific to each contract and updated on a daily basis.

**Intermonth spreads (Calendar spreads)**
SPAN® also takes into account reductions in risk due to the presence of opposite positions on different months within the same combined commodity.

SPAN® proceeds as follows:
The net delta for each month for which a position is held is considered. The long net deltas are totaled as also the short net deltas. The greatest number of possible spreads is formed. This number is then multiplied by the charge for each spread specified by the clearing house. The resulting amount is added to the amount calculated from the risk arrays (or "scanning risk").

Tiers are generally defined within the months in order to consider risks specific to a given quotation period. A spread within a tier (which, for example, groups together the first two months) results in a specific charge, whereas a spread calculated with another tier results in a different charge.

**3.7 COLLATERAL MANAGEMENT**
The kinds of assets that may be posted as initial and maintenance margin are specified by the clearing house and generally include cash, government securities and bank guarantees or letters of credit. More and more often, clearing houses are also accepting shares in money market mutual funds and listed equities as initial margin. Variation margin is typically paid in cash.

The clearing house reserve the right to demand from the Clearing Member a higher, or additional, amount of either cash collateral or those securities or rights to securities that are accepted by the Clearing House. Additional collateral must be deposited immediately in the appropriate currency in the appropriate account. The same right to demand supplemental collateral exists with respect to a General Clearing Member or a Direct Clearing Member to their any Non-Clearing Members for which they clear.

**3.7.1 DEPOSITING COLLATERAL**
Clearing Members can satisfy margin requirements by depositing cash or securities. Cash collateral can be paid in a variety of currencies. The Clearing House stipulates which currencies are permitted for the deposit of cash collateral.
In the case of variation margin (i.e. the daily settlement of profits and losses), and margin calls, payment must be made in cash. In addition, the payment of premiums on traditional options and options on futures, must always be made in cash.

Collateral processing takes place in a straightforward manner. In order to provide clarity for back office staff, we outline the procedures. Individual steps take place in the following sequence:

**Cash Collateral:**
- The Clearing Member announces the planned provision of cash collateral to the Clearing House. Generally this is done by sending the collateral deposit instruction through fax.
- Clearing House debits the announced amount from the deposited account of the respective payment infrastructure. This may be done through S.W.I.F.T messages.
- As soon as the payment has been received, the amount will be credited to the Member as margin and henceforth considered in Intraday Margining and End of Day Margining.
- In order to release the deposited cash collateral, the Clearing Member announces the respective instruction to the Clearing House. Generally this is done by sending the collateral release instruction through fax.
- Clearing House transfers the respective amount to the deposited account of the respective payment infrastructure. Generally this is done by sending S.W.I.F.T instructions.

**Securities Collateral:**
- The Clearing Member announces the planned securities collateral to the clearing house. Generally this is done by sending the collateral deposit instruction through fax.
- The Clearing Member debits the securities directly within the system of the relevant CSD (Clearstream Banking AG Frankfurt (CBF) or SegalInterSettle Zurich (SIS) in case of EUREX CLEARING) to the relevant pledged account.
- These securities will be considered as margin in the next end-of-day margining.
- In order to release the deposited securities, the Clearing Member announces the respective instruction to the clearing house. Generally this is done by sending the collateral release instruction through fax.
- Clearing House releases the securities after the next relevant night time batch as long as sufficient margin is provided.

### 3.7.2 ACCEPTABLE COLLATERAL
The clearing house can accept the collateral in many forms such as Cash in multiple currencies, equity stocks, money market instruments, bonds and Letters of Credit etc.

**HAIR CUT**
Hair cut is the bucket value that is applied on the market value of the collateral. For example, if a 1% haircut is applied to Treasuries, then Treasuries are valued at 99% of their market value. A 5% haircut might be applied to certain corporate bonds, etc.

**CONCENTRATION LIMIT**
Concentration limit is acceptable limit of a particular collateral type. For example, clearing house asks the clearing member to deposit collateral in many forms provided, 25% is maximum
accepted for Bonds, 25% maximum accepted for stocks and remaining for Cash. Concentration limits can be applied based on individual issuers of the bond and stock, asset classes, equity indices, currencies, security ratings and countries of origin etc.

### Acceptable forms of collateral at clearinghouses

<table>
<thead>
<tr>
<th>Clearinghouse</th>
<th>CASH</th>
<th>GOVT. BONDS</th>
<th>CORPORATE BONDS</th>
<th>EQUITIES</th>
<th>OTHER</th>
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<tbody>
<tr>
<td>CME - Clearing Division</td>
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</tr>
</tbody>
</table>

1. **Currenct notes:**
   - 95 currencies = CHF, JPY, GBP, USD
   - 95 + 5 currencies = DKK, NOK, SEK
   - 1. USD only
   - 2. All 95 currencies except GBP
   - 3. JPY only

### EUREX Clearing Acceptable Collateral is as follows:

<table>
<thead>
<tr>
<th>Collateral Type</th>
<th>Currency</th>
<th>Admission Criteria</th>
<th>Security Sub-Group</th>
<th>Haircut %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Collateral</td>
<td>EUR, DEM</td>
<td>1. Marketable assets as announced by ECHR</td>
<td>Government and Short Term Issues (Dubias) Bonds</td>
<td>2.5%</td>
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<tr>
<td></td>
<td>CHF</td>
<td>2. Issuer is Bank</td>
<td>State Issues</td>
<td>2.3%</td>
</tr>
<tr>
<td></td>
<td>USD, GBP,</td>
<td>3. Issuer is Clear</td>
<td>City and Municipality Bonds</td>
<td>4.6%</td>
</tr>
<tr>
<td></td>
<td>DKK, NOK,</td>
<td>4. Exchange listing &amp; price</td>
<td>Corporate &amp; Other Bonds</td>
<td>22.4%</td>
</tr>
<tr>
<td></td>
<td>SEK, AUD,</td>
<td>5. Admissible proportion of the</td>
<td>Bank Bonds</td>
<td>14.8%</td>
</tr>
<tr>
<td></td>
<td>CAD, JPY</td>
<td>6. Also eligible</td>
<td>Central Government Obligations</td>
<td>2.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Exchange listing</td>
<td>City and Municipality Bonds</td>
<td>4.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Admissible proportion of the</td>
<td>State Agencies</td>
<td>4.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Issuer is Clear</td>
<td>Corporate &amp; Other Bonds</td>
<td>22.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Exchange listing</td>
<td>Bank Loans, Mortgage Loans</td>
<td>14.8%</td>
</tr>
<tr>
<td>Equities, ETFs</td>
<td>EUR</td>
<td>1. Issuer is Clear</td>
<td>DAX, DAX Ex, DAX 50, DAX Ex Products</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>CHF</td>
<td>2. Admissible proportion of the</td>
<td>DAX, DAX Ex, DAX 50, DAX Ex Products</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Maximum 30% of required</td>
<td>DAX, DAX Ex, DAX 50, DAX Ex Products</td>
<td>50%</td>
</tr>
<tr>
<td>Cash</td>
<td>CHP, EUR, USD, GBP</td>
<td>4. Issuer is Clear</td>
<td>DAX, DAX Ex, DAX 50, DAX Ex Products</td>
<td>50%</td>
</tr>
</tbody>
</table>

### 3.7.3 CAPITAL REQUIREMENTS

Clearing Houses set capital requirements for Clearing Licenses. These capital requirements are set in line with estimated risk levels and are reviewed quarterly to reflect developments in the markets.

In case of EUREX Clearing, irrespective of the minimum amounts of liable equity capital specified below, the actual amount of liable equity capital that we require our Clearing Members to demonstrate and maintain is equal to the higher amount of:
Ten percent of the 30-day average of the total margin requirements or
Ten percent of the 250-day average of the total margin requirements

The level of the liable equity capital is calculated on a quarterly basis at the end of March, June, September and December for the subsequent quarter.

<table>
<thead>
<tr>
<th>Eurex Derivatives Clearing License</th>
<th>Liable Equity Capital GCM (in EUR/in Millions)</th>
<th>Liable Equity Capital DCM (in EUR/in Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>125</td>
<td>12.5</td>
</tr>
</tbody>
</table>

### 3.7.4 CLEARING FUND

Clearing Fund is the line of defense in order to protect market participants in the event of a Clearing Member default. In addition, the Clearing Fund is reviewed every quarter to ensure the fund is aligned with current market risk. The contribution level is calculated on a quarterly basis at the end of March, June, September and December for the subsequent quarter. The total margin requirement includes all products and asset classes cleared by the Clearing Member.

The amount that each Member to contribute to the Clearing Fund varies depending on the status of the given Clearing Member and its total outstanding margin requirement.

For example, EUREX Clearing - the largest of the following amounts must be deposited by Clearing Members:

- EUR 5 million for GCMs or EUR 1 million for DCMs (minimum contribution)
- Two percent of the 30-day average of the total margin requirement
- Two percent of the 250-day average of the total margin requirement
4 SETTLEMENT

Clearing house directs the clearing member to maintain several accounts for settlement of derivatives contracts. It includes bank account for cash settlement and securities account with Central Depository for physical settlement of the underlying.

**Cash account (By Clearing Members)**
In order to settle Variation Margin (MTM), Premium and taxes etc, each clearing member has to open one cash account which is settlement account with the designated banks. Clearing members may have to open different account with different banks based on the currency. For example, EUREX clearing directs its member to open four accounts separately for settlement in multiple currencies such as EUR, CHF, USD and GBP.

**Settlement Account (By Clearing Members)**
In order to fulfill the physical delivery of securities that arise from physical settlement of futures and options contracts, each clearing member should have account with Central Security Depository. Clearing member who has to deliver the securities should kept their securities in this account so that clearing house able to transfer securities to the counterparty clearing member by providing instructions to the CSD.

EUREX Clearing house directs its members to open account with either Clearstream Banking AG Frankfurt (CBF) or Segaintersettle Zurich (SIS) for physical settlement.
CASH ACCOUNT of CLEARING HOUSE
For each Clearing Member, Clearing House manages internal cash accounts for all currencies, to which premiums, fees, margin (requirements), cash settlements, penalties, as well as other cash obligations resulting from the clearing procedure are debited or credited.

SECURITIES ACCOUNT OF CLEARING HOUSE
Clearing House also manages an internal collateral accounts, for each Clearing Member, that contain the movement of the securities pledged to one of a Clearing Member's collateral accounts at the CSD.

4.1 PHYSICAL SETTLEMENT
Clearing House is responsible for delivery of the underlying to the buyer and cash payment to the seller.
COMMODITY DERIVATIVES SETTLEMENT – FUTURES CONTRACT
The process flows in the event of physical settlement of commodities are different from that of other underlying. The process flow is as follows:

1) DELIVERY NOTICE PERIOD
Unlike in the case of say equity futures, in the case of commodities, a seller has an option to give notice of delivery. This option is given during a period identified as ‘delivery notice period’ (DNP). In a manner similar to options markets such contracts are then assigned to a buyer. The intention of this notice is to allow verification of delivery and to give adequate notice to the buyer of a possible requirement to take delivery.

Typically in all commodity exchanges, delivery notice is required to be supported by a warehouse receipt. The warehouse receipt is the proof for the quantity and quality of commodities being delivered. Some of exchanges have certified laboratories for verifying the quality of goods. In these exchanges the seller has to produce a verification report from these laboratories along with delivery notice. Some exchanges like LIFFE, accept warehouse receipts as quality verification document while others like BMF–Brazil have independent grading and classification agency to verify the quality. In the case of BMF–Brazil a seller typically has to submit following additional documents:

- A declaration, verifying that the asset is free of any and all charges, including fiscal debts related to the stored goods.
- A provisional delivery order of the goods to BM&F (Brazil), issued by the warehouse
- A warehouse certificate showing storage and regular insurance have been paid, covering a 15 day period counted as from the delivery notice issuance date.

The gap between last notice day and last trading day will be driven by possible duration to inspect and take physical delivery. These factors need to be considered while deciding the settlement mechanism.

The seller who notifies the clearing house about delivery of the commodity can not net off his position. Position should be kept open till the time delivery is done. After delivery, the position will be closed out by the clearing house.

2) ASSIGNMENT
Whenever delivery notices are given by the seller, the clearing house identifies the buyer to whom the delivery notice may be assigned. One approach of assignment is to display the delivery notice and allow buyers wishing to take delivery to bid for taking delivery. Among the international exchanges, BMF, CBOT, CME display delivery notices. Alternatively, the clearing houses may assign deliveries to buyers on some basis.

Clearing house assigns the delivery intentions to open long positions. Assignment is done typically either on random basis or first-in–first out basis. In some exchanges (CME) the buyer has the option to give his preference for delivery location. The clearing house decides on the daily delivery order rate at which delivery will be settled. Delivery order rate depends on the spot rate of the underlying adjusted for discount/ premium for quality and freight costs. The discount /premium for quality and freight costs are published by the clearing house before introduction of the contract. The most active spot market is normally taken as the benchmark for deciding spot prices. Alternatively, the delivery rate is determined based on the previous day closing rate for the contract or the closing rate for the day.
3) DELIVERY

After the assignment process, clearing house/exchange issues a delivery order to the buyer. Exchange also informs the respective warehouse about the identity of the buyer. The buyer is required to deposit a certain percentage of the contract amount with the clearing house as margin against the warehouse receipt. The period available for the buyer to take physical delivery is stipulated by the exchange. Buyer or his authorized representative in presence of seller or his representative takes the physical stocks against the delivery order. Proof of physical delivery having been effected is forwarded by the seller to the clearing house and the invoice amount is credited to the seller’s account. If a seller does not give notice of delivery then at the expiry of the contract the positions are cash settled by price difference exactly as in cash settled equity futures contracts. Penalty is imposed on the seller for not marking open positions for delivery.

1. Clearing Member who has Short position in the contract sends a delivery notice to the clearing house about its intent to deliver the underlying. This happens before the last day of the delivery notice period.

2. Some clearing houses request a report from the entire clearing member who has LONG positions in the contract.

3. Clearing House allocates the delivery to the clearing members who has LONG positions.

4. Clearing House notifies the allocated buyer-clearing member (LONG Position holder) about the delivery allocation that includes the seller-clearing member information.

5. Clearing House notifies the seller-clearing member (LONG Position holder) about the delivery allocation that includes the buyer-clearing member information against their delivery notice.

6. Upon receipt of the names of the buyer-clearing member obligated to accept delivery from him, the seller-clearing member shall prepare invoices addressed to its assigned buyers describing the commodity to be delivered to each such buyer and, if applicable, the delivery location. Such invoices shall show the amount which buyers must pay to sellers in settlement of the actual deliveries, based on the delivery prices established by the Clearing House for that purpose, adjusted for applicable premiums, discounts, storage charges, premium charges, premium for FOB conveyance, quantity variations and other items for which provision is made in these Rules relating to contracts. Such invoices shall be in the form designated by the Exchange.

7. Such invoices shall be delivered to the Clearing House by seller-clearing member.

8. Upon receipt of such invoices, the Clearing House shall promptly make them available to buyers to whom they are addressed.

9. A buyer receiving a Delivery Notice from the Clearing House shall make payment in same day funds for the invoicing price and based on receipt of payment can take the delivery.
Typically in all commodity physical settlement, delivery notice is required to be supported by a warehouse receipt. The warehouse receipt is the proof for the quantity and quality of commodities being delivered. Some of exchanges have certified laboratories for verifying the quality of goods. In these exchanges the seller has to produce a verification report from these laboratories along with delivery notice. Some exchanges like LIFFE, accept warehouse receipts as quality verification document while others like BMF–Brazil have independent grading and classification agency to verify the quality.

In the case of BMF–Brazil a seller typically has to submit following additional documents:

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- A provisional delivery order of the goods to BM&F (Brazil), issued by the warehouse.

- A warehouse certificate showing storage and regular insurance have been paid, covering a 15 day period counted as from the delivery notice issuance date.

The gap between last notice day and last trading day will be driven by possible duration to inspect and take physical delivery. These factors need to be considered while deciding the settlement mechanism.
## EXAMPLE – CONTRACTS ON COMMODITY

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Futures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Underlying Commodity</strong></td>
<td>Green coffee beans produced in Brazil, variety coffee arabica, type six or better, good cup or better, to be delivered in the city of São Paulo, State of São Paulo, Brazil.</td>
</tr>
<tr>
<td><strong>Price Quote</strong></td>
<td>USD per 60-net kilogram bag to two decimal places.</td>
</tr>
<tr>
<td><strong>Tick Size</strong></td>
<td>USD 0.06 per 60-net kilogram bag</td>
</tr>
<tr>
<td><strong>Contract Size</strong></td>
<td>100 bags weighing 60-net kilograms each, or 6,000 net kilograms</td>
</tr>
<tr>
<td><strong>Delivery Months</strong></td>
<td>March, May, July, September and December</td>
</tr>
<tr>
<td><strong>Last trading day</strong></td>
<td>The sixth business day preceding the last day of the delivery month. On that day, neither opening of new short positions nor day trading shall be allowed.</td>
</tr>
<tr>
<td><strong>Daily settlement - Variance Margin</strong></td>
<td>Delivery shall be made at registered warehouses. Whenever a delivery is made in a city other than São Paulo, freight costs shall be deducted when the cash settlement value is calculated.</td>
</tr>
<tr>
<td><strong>Delivery points</strong></td>
<td>The sellers who decide not to offset their positions up to the last trading day shall electronically register a Delivery Notice via the BM&amp;F Physical Delivery System, during the period that initiates on the second business day of the delivery month and terminates on the seventh business day preceding the last day of the delivery month, at 6:00 p.m. (Brasilia time).</td>
</tr>
<tr>
<td><strong>Period for Delivery Notice registration</strong></td>
<td>The sellers who reside in Brazil shall be allowed to assign third parties to make delivery of the coffee. The sellers who do not reside in Brazil must mandatorily appoint a third party residing in Brazil to make delivery of the coffee. The buyers shall be allowed to assign third parties to take delivery of the coffee. Should a nonresident buyer wish to take delivery of the coffee, the nonresident buyer must mandatorily appoint a legal representative to provide transportation and shipment. The type must be six or better. Inferior grades shall not be eligible for delivery.</td>
</tr>
<tr>
<td><strong>Third-party assignment and invoice</strong></td>
<td>The coffee, which cannot have been salvaged from fire or contain foreign matter other than that is typically found among the beans, must be packed in well identified new and sound first quality jute bags, type 2 or 3J, which cannot come from waste or be re-used; must have a minimum 520-gram weight with a 3% tolerance, and must be free from hydrocarbon and treated with vegetable oil. When one-way big bags are used for coffee delivery, they must be made of woven polypropylene and have a capacity of 1,200 net kilograms. Each bag must weigh between 3,300 and 3,700 kilograms and be 60 centimeters in width, 90 centimeters in length and 100 centimeters in height. The coffee must be classified by BM&amp;F, in accordance with its rules and regulations which conform to current legislation—Law No. 97/2, of May 28, 2000, Decree No. 3864, of November 17, 2000, and Normative Instruction No. 8, of June 11, 2003, signed in our warehouses and grouped.</td>
</tr>
<tr>
<td><strong>Quality Information</strong></td>
<td>Coffee which has been poorly dried, damaged by rain, moisture, mud, oxidation, or having a taste uncharacteristic to arabica coffee shall not be eligible for delivery.</td>
</tr>
<tr>
<td><strong>Cash Settlement</strong></td>
<td>The cash settlement of a physical delivery shall be made by the buyer on the third business day subsequent to the day the Delivery Notice has been designated to the buyer. The funds transfer to the seller shall be made by BM&amp;F on the fifth business day subsequent to the day the Delivery Notice has been designated to the buyer.</td>
</tr>
</tbody>
</table>
### Commodity Derivatives Settlement – Options Contract

In option contracts, there is exercise request from the buyer of the contract either manually or automatically by the clearing house. Clearing house will randomly assign the exercise request to the open short positions, thereby resulting in physical delivery of commodities by the seller to the buyer. Buyer will make cash payments against the delivery to the clearing house.

### Futures on Financial Instruments Settlement

Financial instrument may include the underlying such as Equity Stocks, currency and bonds etc. At expiration, holders of short positions of stock futures are required to deliver physical shares of the underlying securities, and holders of long positions take delivery of the underlying securities. This process is facilitated by the clearing house through the settlement account of clearing members with CSD. Random assignment of short positions against long positions is done by the clearing house.

### Options on Financial Instruments Settlement

Financial instrument may include the underlying such as Equity Stocks, currency and bonds etc.

The following scenarios are possible in case of Exercise/Assignment Settlement:

- The assignment of a call position obliges the short position holder (writer) of a call option to deliver the underlying against payment to the long position holder.

- The assignment of a put position obliges the short position holder (writer) of a put option to accept delivery of the underlying against payment to the long position holder.

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Call Options on Futures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying Contract</td>
<td>The Arabica Coffee Futures Contract traded at BM&amp;F.</td>
</tr>
<tr>
<td>Price Quotation</td>
<td>Option premium in USD per 60-net kilogram bag to two decimal places</td>
</tr>
<tr>
<td>Price Tick</td>
<td>US$0.01 per 60-net kilogram bag</td>
</tr>
<tr>
<td>Contract Size</td>
<td>Each option contract is based on one Arabica Coffee Futures Contract, the round lot of which is 100 bags, weighing 60 net kilograms each.</td>
</tr>
<tr>
<td>Strike Price</td>
<td>Strike prices shall be expressed in USD per 60-net kilogram bag. Strike prices shall have minimum increments of US$2.50 per bag.</td>
</tr>
<tr>
<td>Delivery Months</td>
<td>March, May, July, September, and December, whose underlying futures will respectively be the contract that expires in March, May, July, September, and December.</td>
</tr>
<tr>
<td>Beginning of Trading</td>
<td>First business day subsequent to the beginning of trading of the underlying futures month, provided that the series be authorized by BM&amp;F.</td>
</tr>
<tr>
<td>Last Trading Day</td>
<td>Second Friday of the month preceding the option calendar month, or should this day not be a trading day at BM&amp;F the preceding business day.</td>
</tr>
<tr>
<td>Premium Cash Settlement</td>
<td>Premiums shall be cash settled on the business day following the trading day.</td>
</tr>
<tr>
<td>Option Style</td>
<td>This is an American option, which means that it may be exercised by the buyer as of the first business day following the day a position has been initiated, up to the last trading day.</td>
</tr>
<tr>
<td>Option Exercise</td>
<td>The exercise of an option implies that the buyer shall enter into a long position on the Arabica Coffee Futures Contract and the seller shall enter into a short position on the Arabica Coffee Futures Contract, both at the corresponding strike price. The requirements of the Arabica Coffee Futures Contract relating to margins, daily settlements, and delivery settlement shall be applicable in both cases.</td>
</tr>
</tbody>
</table>
In case of options on futures, the short position holder (writer) of a call option is obliged to take a short position in the corresponding futures contract. Corresponding long position on futures contract will be taken by the long position holder. Clearing house automatically opens the short and long position in futures contracts based on exercise-assignment. In some of the clearing houses, in the case of options on an index, cash settlement takes place.

In the case of options on futures the short position holder (writer) of a put option has to take a long position in the corresponding futures contract. Corresponding short position on futures contract will be taken by the long position holder. Clearing house automatically opens the short and long position in futures contracts based on exercise-assignment. In some of the clearing houses, in the case of options on an index, cash settlement takes place.

1. The clearing member who has assigned will deliver the securities to clearing house through the securities account with Central Depository.

2. The clearing member who has exercised will make payment to clearing house through its settlement account with bank.

3. Clearing house will transfer settlement amount to the assigned clearing member’s settlement account and transfer the securities to the exercises clearing member’s securities account.

4.2 CASH SETTLEMENT

4.2.1 MARK TO MARKET SETTLEMENT

For each Futures Contract, profits and losses arising out of open positions on any Exchange day will be determined at the end of the Post-Trading Period and credited to or debited from the internal cash clearing account.

- **DAILY SETTLEMENT** - For open positions from the previous Exchange day, the amount to be credited or debited shall equal the difference between the daily settlement prices of the contract in question on the relevant Exchange day and the previous exchange day.

- **FINAL SETTLEMENT** - For the closed positions on the final trading day, the amount to be credited or debited shall equal the difference between the final day settlement price at which the contract was expired and the daily settlement price for the previous exchange day.

4.2.2 PREMIUM SETTLEMENT

For Option Contracts, net premium to be payable are receivable by the clearing member is calculated based on outstanding positions. This should be settled in cash through designated clearing banks. Premium should be payable on the exchange day following the day of the trade (T+1 day).
5 REPORTS

Clearing house provides the trading members and clearing member with various reports in Intra-day and end of day that help the members remain on top of their risk situations. These reports contain detailed and extensive information about risk exposure. Dedicated risk reports that provide an important break-down of all necessary margin and cash flow components make the calculation of margin comprehensible and transparent.

These reports allow Clearing Members to control and monitor margin and cash flow components of their clients on a near-time basis intra-day and end of day.

<table>
<thead>
<tr>
<th>Report</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Report</td>
<td>Clearing house provides the contract details i.e. the products which can be traded on exchanges. It is common to all trading members and clearing members.</td>
</tr>
<tr>
<td>Trades Report</td>
<td>Clearing house provides the trade details in intra day and end of the day. Separate trade files are provided to clearing member and trading members at the end of day. Trading members and Clearing members get trade details which are specific to it.</td>
</tr>
<tr>
<td>Positions Report</td>
<td>Clearing house provides the position details at each client account level in end of day to the clearing member. Clearing members get position details which are specific to it.</td>
</tr>
<tr>
<td>Exercise / Assignment Report</td>
<td>Clearing house provides the report that contains all the exercise/assignment details to the clearing member. Clearing members get exercise/assignment details which are specific to it.</td>
</tr>
<tr>
<td>Margin Summary</td>
<td>This contains all the margins levied by the clearing house at clearing member level. Margin includes Initial Margin, Premium Margin and Exposure Margin etc. Clearing member get margin summary which are specific to it.</td>
</tr>
<tr>
<td>Detailed Margin Statement</td>
<td>This contains all the margins levied by the clearing house at each client account level of the clearing member. Margin includes Initial Margin, Premium Margin and Exposure Margin etc. Clearing members get margin details for those client accounts specific to it.</td>
</tr>
<tr>
<td>Collateral Summary</td>
<td>This contains all the collateral deposited by the clearing member and the available collateral after margin adjustments.</td>
</tr>
<tr>
<td>Premium Settlement Statement</td>
<td>This contains the premium amount to be payable/receivable to/from clearing member for the trades done for the day.</td>
</tr>
<tr>
<td>Variation Margin (MTM) Settlement Statement</td>
<td>This contains the marked to market amount to be payable/receivable to/from clearing member for the day based on end of day positions.</td>
</tr>
<tr>
<td>Delivery Reports</td>
<td>Clearing member get physical delivery details which are specific to it.</td>
</tr>
<tr>
<td>Daily Settlement Statement</td>
<td>This contains the all the settlement amount that are payable/receivable by the clearing members.</td>
</tr>
<tr>
<td>Fees and Tax Statement</td>
<td>Clearing house provides all the fees and tax details to clearing members and trading members. Details are different for different trading members and clearing members.</td>
</tr>
</tbody>
</table>
BENEFITS OF USING CCP

Trading benefits
- Traders value anonymity. The facilitation of full post-trade anonymity through the introduction of CCP benefits both users and trading platforms.
- CCPs help narrow trading spreads. The reduction in market impact allows a trader to offer tighter spreads to buy-side institutional clients. Narrower spreads, in turn, attract further trading activity to the order book.

Risk benefits
- Decreased (counterparty) credit risk. Use of a CCP offers two credit exposure enhancements. First, it facilitates multilateral exposure netting, which typically reduces overall credit exposure. Second, it consolidates bilateral exposures into a single low risk exposure with a CCP.

Balance sheet benefits
- Increased return on capital via cost reduction.
- Improved credit standing. Firms may elect to retain the released capital and thereby improve their credit standings (contribution to profitability).
- Reduced leverage ratios. Use of a CCP in the repo market has the further benefits of enabling users to net cash assets and liabilities and reducing leverage ratios.

Operational benefits
- CCPs can reduce back-office tasks over the long run. Use of a CCP and accompanying risk management methods introduces significant savings at the operational level.
- Reductions in overall market costs. While the cost discussion often focuses on merger activity at the settlement level, most of these anticipated savings are achieved at the clearing level through the expansion of netting and the appropriate choice of settlement platform.
- Netting cuts settlement costs when fewer trades proceed to settlement. These cost reductions are valuable to private investors.
- Increased straight-through processing (STP). By standardizing market processes, documentation and systems and processing trades through a single channel, STP can be increased greatly and costs reduced, optimizing the level of capital required to support operational risk.
## Derivatives Clearing Houses in US Region

<table>
<thead>
<tr>
<th>Clearing House</th>
<th>Exchanges Cleared</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Clearing Corporation</td>
<td>Cantor Financial Futures Exchange, New York Board of Trade</td>
</tr>
<tr>
<td>Board of Trade Clearing Corp</td>
<td>Chicago Board of Trade, MidAmerica Exchange, Merchant’s Exchange of St. Louis</td>
</tr>
<tr>
<td>BrokerTec Clearing Company, LLC</td>
<td>BrokerTec Futures Exchange</td>
</tr>
<tr>
<td>Chicago Mercantile Exchange (Clearing Division)</td>
<td>Chicago Mercantile Exchange</td>
</tr>
<tr>
<td>Intermarket Clearing Corporation</td>
<td>Amex Commodities Corporation, Philadelphia Board of Trade</td>
</tr>
<tr>
<td>Kansas City Board of Trade Clearing Corp</td>
<td>Kansas City Board of Trade</td>
</tr>
<tr>
<td>Minneapolis Grain Exchange</td>
<td>Minneapolis Grain Exchange</td>
</tr>
<tr>
<td>New York Mercantile Exchange</td>
<td>New York Mercantile Exchange</td>
</tr>
<tr>
<td>OneExchange Clearing Corporation</td>
<td>OneExchange Board of Trade</td>
</tr>
<tr>
<td>Options Clearing Corporation</td>
<td>American Stock Exchange (options)</td>
</tr>
<tr>
<td></td>
<td>Chicago Board Options Exchange (options)</td>
</tr>
<tr>
<td></td>
<td>International Securities Exchange (options)</td>
</tr>
<tr>
<td></td>
<td>Pacific Exchange (options)</td>
</tr>
</tbody>
</table>

## Derivatives Clearing Houses in Europe Region

<table>
<thead>
<tr>
<th>Clearing House</th>
<th>Exchanges Cleared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athens Derivatives Clearing House (ADECH)</td>
<td>Athens Derivatives Exchange (ADEX)</td>
</tr>
<tr>
<td>Bolsa de Derivados do Porto</td>
<td>Bolsa de Derivados do Porto</td>
</tr>
<tr>
<td>Clearnet SA</td>
<td>Euronext Paris SA, Euronext Brussels, Euronext Amsterdam</td>
</tr>
<tr>
<td>Cassa di compensazione e garanzia</td>
<td>MIF-MTO (Italian government bond derivatives market), IDEM (Italian stock derivatives market)</td>
</tr>
<tr>
<td>Eurex Clearing AG</td>
<td>Eurex Deutschland, Eurex Zurich, Helsinki Exchange</td>
</tr>
<tr>
<td>FUTOP</td>
<td>Copenhagen Stock Exchange (CSE)</td>
</tr>
<tr>
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<td>OM Stockholmsbörsen AB</td>
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<td>Wiener Börse AG</td>
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