CLAIMS

1. A method performed by a pre-order validation device for pre-match risk validation of orders, the method comprising:

receiving (S301) from a client system, by a receiver, an electronic data message comprising an order and identification information identifying an account pertaining to said client system;

receiving (S302) from a clearinghouse system, by the receiver, an electronic data message comprising information associated with a portfolio associated with said account;

receiving (S303) from an exchange system, by the receiver, an electronic data message comprising information about orders associated with said account;

performing (S302, S304), by a processing logic, a risk analysis for said portfolio associated with said account to determine whether the received order will be accepted so that the exchange system is allowed to attempt to match the order;

performing (S303, S304), by the processing logic, a risk analysis for said orders associated with said account to determine whether the received order will be accepted so that the exchange system is allowed to attempt to match the order,

determining (S305), by the processing logic, a margin requirement value for said account based on the risk analysis performed for said portfolio and for said orders;

determining (S307), by the processing logic, if said margin requirement value is higher than a pre-defined threshold value for said account; and

determining (S309), by the processing logic, that the received order is accepted for subsequent matching by the exchange system when the margin requirement value for the account is below or equal to the threshold value for the account.

2. The method according to claim 1, comprising: *determining (S308)*, by the processing logic, that that the received order is rejected for subsequent matching

by the exchange system when the margin requirement value for the account is higher than the threshold value for the account.

3. The method according to claim 1, further comprising: *transmitting*, by a transmitter, the received order to the exchange system for subsequent matching by the exchange system when the margin requirement value for the account is below or equal to the threshold value for the account.

4. The method according to any of the claims 1-3, comprising: *transmitting (S302)*, by a transmitter, an electronic data message to the clearing house system, said electronic data message comprising the identification information associated with said account as well as a request to return information associated with a portfolio associated with said account.

5. The method according to any of the claims 1-4, comprising: *transmitting (S302)*, by a transmitter, an electronic data message to the exchange system, said electronic data message comprising the identification information associated with said account as well as a request to return information about orders associated with said account.

6. The method according to any of the previous claims, wherein parameters of the margin requirement value are determined, by the processing logic, based at least on a scanning risk.

7. The method according to claim 6, further comprising:

establishing (S306), by the processing logic, one or several scenario points for said account, each scenario point being based on an underlying price and an underlying volatility;

establishing (S306), by the processing logic, for each of the one or several scenario points, a profit or loss;

determining (S306), by the processing logic, a worst case scenario point representing a highest loss,

setting (S306), by the processing logic, the highest loss in the worst case scenario point as the scanning risk; and

modifying (S306), by the processing logic, the margin requirement value on the basis of the highest loss in the scanning risk.

8. The method according to claim 7, wherein establishing the profit or loss for each of the one or several scenario points comprises:

identifying, by the processing logic, each order that contribute with a loss in each scenario point; and

calculating, by the processing logic, a profit or loss value for each of the scenario points, wherein the calculation is based on a profit or loss value of the portfolio and a loss value associated with the identified orders in each scenario point.

9. The method according to any of the claims 7-8, further comprising: *modifying* the margin requirement value by adding one or both of the following parameters: an intermonth spread charge and a delivery month charge.

10. The method according to any of the previous claims, wherein the method is performed before an attempt is made, by a matching device of the exchange system, to match the received order with orders previously stored in an order book of the exchange system.

11. A pre-order validation device (306) for pre-match risk validation of orders before an attempt is made to match a received order with orders previously stored in an order book (305) of an exchange system (300), the pre-order validation device (306) comprising:
    - a *receiver*; and
    - *processing logic*, wherein

the *receiver* is configured to receive, from a client system, an electronic data message comprising an order and identification information identifying an account pertaining to said client system; to receive, from a

clearinghouse system, an electronic data message comprising information associated with a portfolio associated with said account; and to receive from the exchange system, an electronic data message comprising information about orders associated with said account; and wherein

the *processing logic* is configured to perform a risk analysis for said portfolio associated with said account to determine whether the received order will be accepted so that the exchange system is allowed to attempt to match the order; to perform a risk analysis for said orders associated with said account to determine whether the received order will be accepted so that the exchange system is allowed to attempt to match the order; to determine a margin requirement value for said account based on the risk analysis performed for said portfolio and for said orders; to determine if said margin requirement value is higher than a pre-defined threshold value for said account; and to determine that the received order is accepted for subsequent matching by the exchange system when the margin requirement value for the account is below or equal to the threshold value for the account.

12. The pre-order validation device (306) according to claim 11, wherein the *processing logic* is configured to determine that that the received order is rejected for subsequent matching by the exchange system when the margin requirement value for the account is higher than the threshold value for the account.

13. The pre-order validation device (306) according to claim 11 or 12, comprising a *transmitter* configured to transmit the received order to the exchange system for subsequent matching by the exchange system when the margin requirement value for the account is below or equal to the threshold value for the account.

14. The pre-order validation device (306) according to any of the claims 11-13, comprising a *transmitter* configured to transmit an electronic data message to the clearing house system, said electronic data message comprising the

identification information associated with said account as well as a request to return information associated with a portfolio associated with said account.

15. The pre-order validation device (306) according to any of the claims 11-14, comprising a *transmitter* configured to transmit an electronic data message to the exchange system, said electronic data message comprising the identification information associated with said account as well as a request to return information about orders included in the order book that is associated with said account.

16. The pre-order validation device (306) according to any of the claims 11-15, wherein parameters of the margin requirement value are determined, by the processing logic, based at least on a scanning risk.

17. The pre-order validation device (306) according to claim 16, wherein the *processing logic* is configured to establish one or several scenario points for said account, each scenario point being based on an underlying price and an underlying volatility; to establish for each of the one or several scenario points, a profit or loss; to determine a worst case scenario point representing a highest loss; to set the highest loss in the worst case scenario point as the scanning risk; and to modify by the processing logic, the margin requirement value on the basis of the highest loss in the scanning risk.

18. The pre-order validation device (306) according to claim 17, wherein the *processing logic* further is configured to identify each order that contribute with a loss in each scenario point; and calculate a profit or loss value for each of the scenario points, wherein the calculation is based on a profit or loss value of the portfolio and a loss value associated with the identified orders in each scenario point.

19. The pre-order validation device (306) according to any of the claims 17-18, wherein the processing logic is further configured to modify the margin

requirement value by adding one or both of the following parameters: an intermonth spread charge and a delivery month charge.

20. The pre-order validation device (306) according to any of claims 11-19, wherein the pre-order validation device is comprised in the exchange system.

CLAIMS:

1. A method, comprising:

at an exchange system that includes a memory, a network interface device, and at least one processor:

storing, in the memory, an order book, the order book comprising orders for financial instruments that have been cleared by the exchange system for matching;

receiving, via the network interface device, an electronic data message including an order, the order comprising information associated with an account;

performing, by the least one processor, a risk analysis based on:

portfolios associated with the account ;

the received order; and

orders associated with the account and stored in the order book;

calculating, by the at least one processor, a margin requirement value for the account based on the risk analysis;

determining, by the at least one processor, if the margin requirement value for the account is higher than a threshold value for the account;

clearing, by the at least one processor, the order for matching when the margin requirement value for the account is equal to or lower than the threshold value for the account; and

upon clearing the order for matching, the at least one processor matching the order against one or more orders in the order book or storing the order in the order book.

2. The method of claim 1, wherein components of the margin requirement value calculations are determined based on at least one of a scanning risk, an intermonth spread charge, or a delivery month charge.

3. The method of claim 2, further comprising:

establishing one or more scenario points for the account, each scenario point based on an underlying price and a volatility;

determining, for each of the one or more scenario points, a profit or a loss value;

determining a worst case scenario point representing a highest loss and setting the profit or loss value in the worst case scenario point as the scanning risk; and

modifying the margin requirement value based on the highest loss in the scanning risk.

4. The method of claim 3, further comprising:

identifying, by the at least one processor, each order that contributes with a loss in each scenario point, and wherein determining the profit or loss value for each of the one or more scenario points comprises:

calculating, by the at least one processor, a profit or loss value wherein the calculation is based on a profit or loss value of the portfolios and a loss value associated with the identified orders in each scenario point.

5. The method of claim 3, further comprising:

setting the intermonth spread charge to a predetermined value;

reducing a tier structure having a plurality of tiers to a single tier containing all orders;

assigning a tier spread charge corresponding to a largest preconfigured tier spread charge;

determining an upper bound value of the intermonth spread charge based on the tier spread charge and an assumption that all orders in the order book have been matched; and

modifying the margin requirement value based on the upper bound value.

6. The method of claim 3, further comprising:

determining a delivery month based on a current calendar month;

determining one or more orders in the order book for an account that could match for the delivery month;

calculating one or more portfolios based on the one or more orders in the order book that could match for the delivery month;

selecting a first portfolio having a highest number of long positions;

selecting a second portfolio having a highest number of short positions;

determining whether the first portfolio or the second portfolio has a highest number of outright positions;

selecting either the first portfolio or the second portfolio when the portfolio is determined to have the highest number of outright positions;

determining an upper bound value of the delivery month charge based on the selected first or second portfolio; and

modifying the margin requirement value based on the upper bound value of the delivery month charge.

7. The method of claim 3, wherein the margin requirement value may be modified by adding together one or more of the scanning risk, the intermonth spread charge, and the delivery month charge.

8. A non-transitory computer-readable storage medium having computer readable code embodied therein which, when executed by a computer having a memory, a data transmission device, and one or more processors, causes the computer to perform functionality comprising:

storing, in the memory, an order book, the order book comprising orders for financial instruments that have been cleared for matching;

receiving, via the data transmission device, an electronic data message including an order, the order comprising information associated with an account;

performing, by the one or more processors, a risk analysis based on:

portfolios associated with the account;

the received order; and

orders associated with the account and stored in the order book;

calculating, by the one or more processors, a margin requirement value for the account based on the risk analysis;

determining, by the one or more processors, that the margin requirement value for the account is higher than a threshold value for the account;

clearing, by the one or more processors, the order for matching; and

matching, by the one or more processors, the order against one or more orders in the order book.

9. An apparatus, comprising:

a memory configured to store an order book, the order book comprising orders for financial instruments;

a network interface device configured to receive an electronic data message including an order, the order comprising information associated with an account; and

at least one processor, coupled to the memory and the network interface device, configured to perform functionality including:

performing a risk analysis based on:

one or more portfolios associated with the account;

the received order; and

orders associated with the account and stored in the order book;

calculating a margin requirement value for the account based on the risk analysis;

determining, based on the margin requirement value, whether to clear the order for matching; and

clearing the order for matching.

10. The apparatus of claim 9, wherein components of the margin requirement value calculations are determined based on at least one of a scanning risk, an intermonth spread charge, or a delivery month charge.

11. The apparatus of claim 10, wherein the at least one processor is further configured to perform functionality comprising:

establishing one or more scenario points for the account, each scenario point based on an underlying price and a volatility;

determining, for each of the one or more scenario points, a profit or a loss value;

determining a worst case scenario point representing a highest loss and setting the profit or loss value in the worst case scenario point as the scanning risk; and

modifying the margin requirement value based on the highest loss in the scanning risk.

12. The apparatus of claim 11, wherein the at least one processor is further configured to perform functionality comprising:

identifying, by the at least one processor, each order that contributes with a loss in each scenario point, and wherein determining the profit or loss value for each of the one or more scenario points comprises:

calculating, by the at least one processor, a profit or loss value wherein the calculation is based on a profit or loss value of the portfolios and a loss value associated with the identified orders in each scenario point.

13. The apparatus of claim 11, wherein the at least one processor is further configured to perform functionality comprising:

setting the intermonth spread charge to a predetermined value;

reducing a tier structure having a plurality of tiers to a single tier containing all orders;

assigning a tier spread charge corresponding to a largest preconfigured tier spread charge;

determining an upper bound value of the intermonth spread charge based on the tier spread charge and an assumption that all orders in the order book have been matched; and

modifying the margin requirement based on the upper bound value.

15. A system, comprising:

a memory configured to store data that includes an order book, the order book including orders for financial instruments;

a data transceiver device configured to receive information that includes an order for a financial instrument, the order associated with an account; and

a processor, coupled to the memory and the data transceiver, and configured to perform functionality comprising:

performing a risk analysis based on:

one or more portfolios associated with the account; and

the received order;

calculating a margin requirement value for the account based on the risk analysis;

determining that the margin requirement value for the account is higher than a threshold value for the account; and

matching the order against one or more orders in the order book or storing the order in the order book.