ATHENS EXCHANGE S.A.

HELLENIC EXCHANGES S.A.

ATHEXClear

Re-innovating

the ATHEX Derivatives Market

July 2013

Version 0.60

Restructuring the Derivatives Market

Having more than 13 years of experience in the Derivatives Market

Because of the Regulation modifications due to *EMIR & ESMA Guidelines*

Taking into consideration the various participants' requests

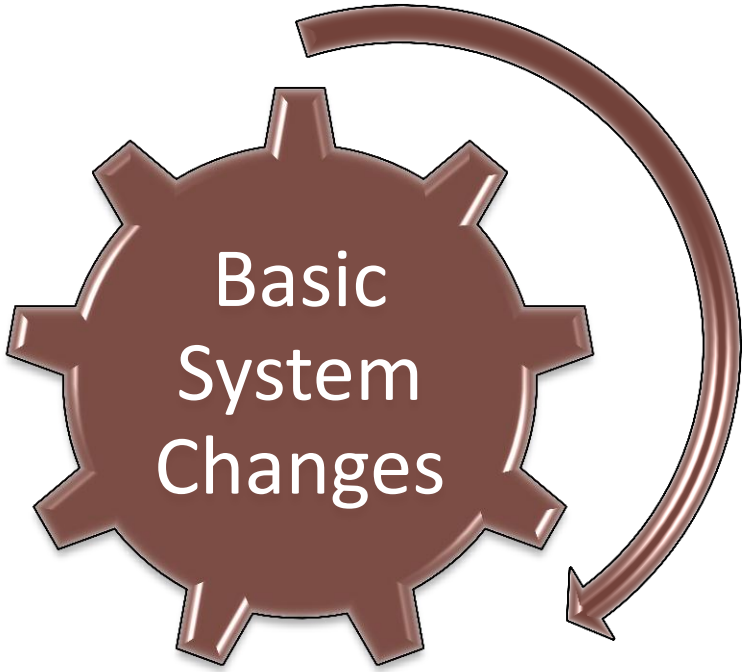
Following the international trends by which exchanges are offering single platforms for all products

We proceed to the operational Re-inovation / Redesigning of the ATHEX Derivatives model with New services-Products & common Infrastructure

Agenda

- Basic System Changes
- Basic Changes on Trading
- New Repo Market
- Basic Changes on Risk, Clearing & Settlement
- Appendix


Cash Market
Derivatives Market


Basic System Changes

Common infrastructure

- **A single and common trading platform** for all traded products (shares, rights, bonds, warrants, futures, options, repo, etc).
  - The new trading platform will be based on the existing OASIS/ETS Trading System and ATHEX GW (ODL+FIX), which means the total abolishment of the current Derivatives Market trading system (OASIS/DTS) and OMNet API
- **A single and common clearing & settlement system** for all post trading procedures for all products
  - The new clearing system will be based on the existing clearing and settlement system that is currently used for the Cash Market (DSS – Dematerialized Securities System), which means the total abolishment of the current Derivatives Market clearing and settlement system (DCS)
- **Common Data Feed for all Markets** (Cash, Derivatives, Repo)
- **The adaptation of the Bloomberg Global ID (BBGID),** as an identifier for all products which does not change during the product lifetime
  - BBGID and Product Symbol (OASIS Symbol) will be the unique keys and not ISIN, as it is now

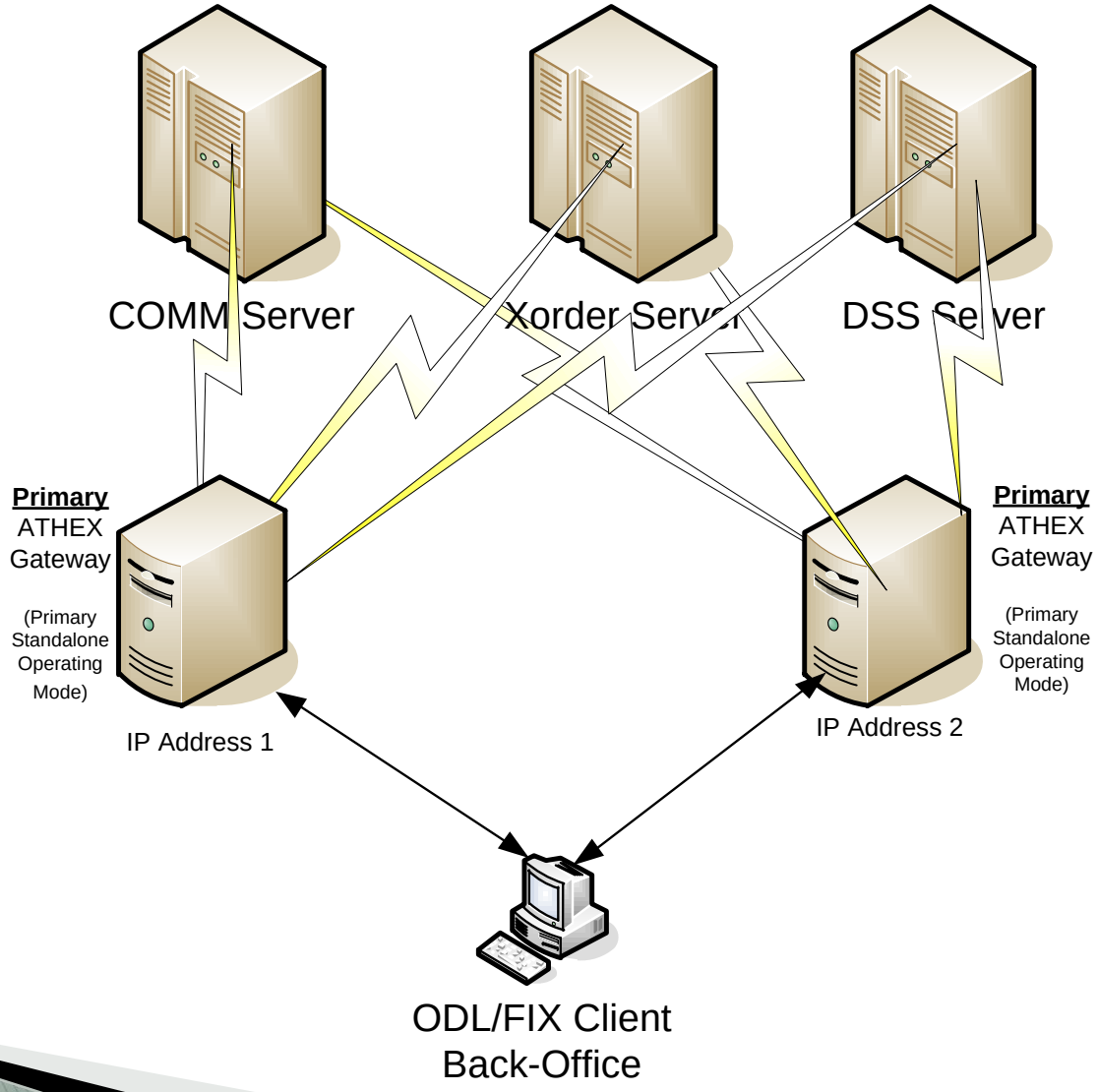
System changes at a glance

SYSTEMS	NOW	AFTER
Trading System for the Cash Market	OASIS / ETS (Equities Trading System)	OASIS / ETS (Equities Trading System) *It will be named **OASIS (v4.0)***
Trading System for the Derivatives and Repo Markets	OASIS / DTS (Derivatives Trading System)	
API for the Cash Market	• ODL (native API), or • FIX 4.2 *Both by using the ATHEX GW (v1.1)*	• ODL (native API), or • FIX 4.4 *Both by using the **ATHEX GW (v2.0)***
API for the Derivatives Market	OMNet API	
Clearing / Settlement System for the Cash Market	DSS (Dematerialized Securities System)	DSS (Dematerialized Securities System)
Clearing / Settlement System for the Derivatives Market	DCS (Derivatives Clearing System)	
Data Feed for the Cash Market	Cash Market Data Feed Spec	Common Data Feed Spec
Data Feed for the Cash Market	Derivatives Market Data Feed Spec	

Benefits from common infrastructure

- **Economies of scale and simplicity** for all market participants, since all of them will be able to access and use common trading & clearing systems, always according to their membership
- **Operational cost reduction** due to the use of common infrastructure regarding trading, clearing and settlement procedures including both Cash, Derivatives and Repo Markets
- **Homogenization of Clearing and Settlement procedures** (e.g. trade rectification, clearing/settlement give-ups, etc)
- Use of **common type of orders** for both Cash & Derivatives Market
- Simplification and **efficiency of Stock Repo Market**
- Implementation of **new Risk Management model**, compliant to the European guidelines and requirements (EMIR), without compromising the quality of offered services and transactions' security of all Market participants

ATHEX GW connections



No data feed via ATHEX GW

- As it is known, ATHEX GW does not disseminate market data feed at the members' systems, as the OMNet API does

- In the new environment, a member can receive this feed either by a data vendor, or by a direct connection to the IOCP (ie, to become a data vendor), by using the existing connectivity to ATHEX:

  - Either for own use, or

  - For redistributing the feed to its clients


Cash Market
Derivatives Market


Basic
Changes
on Trading

Basic changes on trading (1/3)

Members and Users

- Common Members' ID (Cash & Derivatives Markets)
- Common Users' IDs

Trading Limits for Derivatives Market

- Introduction of **daily price fluctuation limits** in the Futures and Options which contributes to:
  - The limitation of the market volatility
  - The participants' protection by preventing erroneous input
- FUTURES: "±X%" on the yesterday's fixing price
- OPTIONS: "±X%" on the theoretical price

Basic changes on trading (2/3)

New Risk Management Model (during the trading session)

- Introduction of Credit Limits consumption also at the Derivatives Market
- Calculation of orders' & trades' risk for Futures, Options and Repo products
- FUTURES: No of contracts*Contract size*Price*ε
- OPTIONS: No of contracts*Contract size*ε*Underlying price

Market Making

- Improvements in the Market Making Model
  - Market making only through API
  - Enrichment using automated procedures (ie, no obligations when the underlying is in a pre-call phase)

Basic changes on trading (3/3)

Combo Orders

- Introduction of Time Spreads to the new system (eg, sell the current expiration and buy the next one with a single order)


Cash Market
Derivatives Market


New
Repo
Market

New Stock Repo model benefits

New Stock Repo Model

- **Simplify the stock lending – borrowing procedure**
  - No expirations on the stock lending – borrowing contracts
  - No need for rollovers
  - ATHEXClear will be the CCP, but without the pool
- **More participants**
  - All the Custodians can lend shares via DSS, and
  - All Cash & Derivatives Trading members can borrow shares via OASIS

Stock Repo market participants

ATHEXClear

Willing to
Borrow stocks

Trading Members of both Cash and Derivatives Market

ATHEX Trading System

Willing to
Lend stocks

Custodians

HELEX Custody System

Repo Clearing

Derivatives Market Clearing Members

ATHEXClear Clearing System

Short Description of the Repo Model (1/2)

- A lender (via his Custodian), by using the HELEX Custody system will state a certain amount of shares that is willing to lend. This lending statement can be valid till a specific date, or till the Custodian of the lender cancels it

- ATHEXClear, collects and aggregates those lending statements and by using a specific algorithm for discovering the lending rates, creates the Lending Orders (Sell Orders)

- Those Lending Orders are forwarded at the ATHEX trading system (OASIS) and more specifically at the Repo Market of ATHEX

- As said, every Sell Order has a specific rate (as a price) and volume. The total volume of the Sell Orders is less or equal to the Daily Total Lending Volume

Short Description of the Repo Model (2/2)

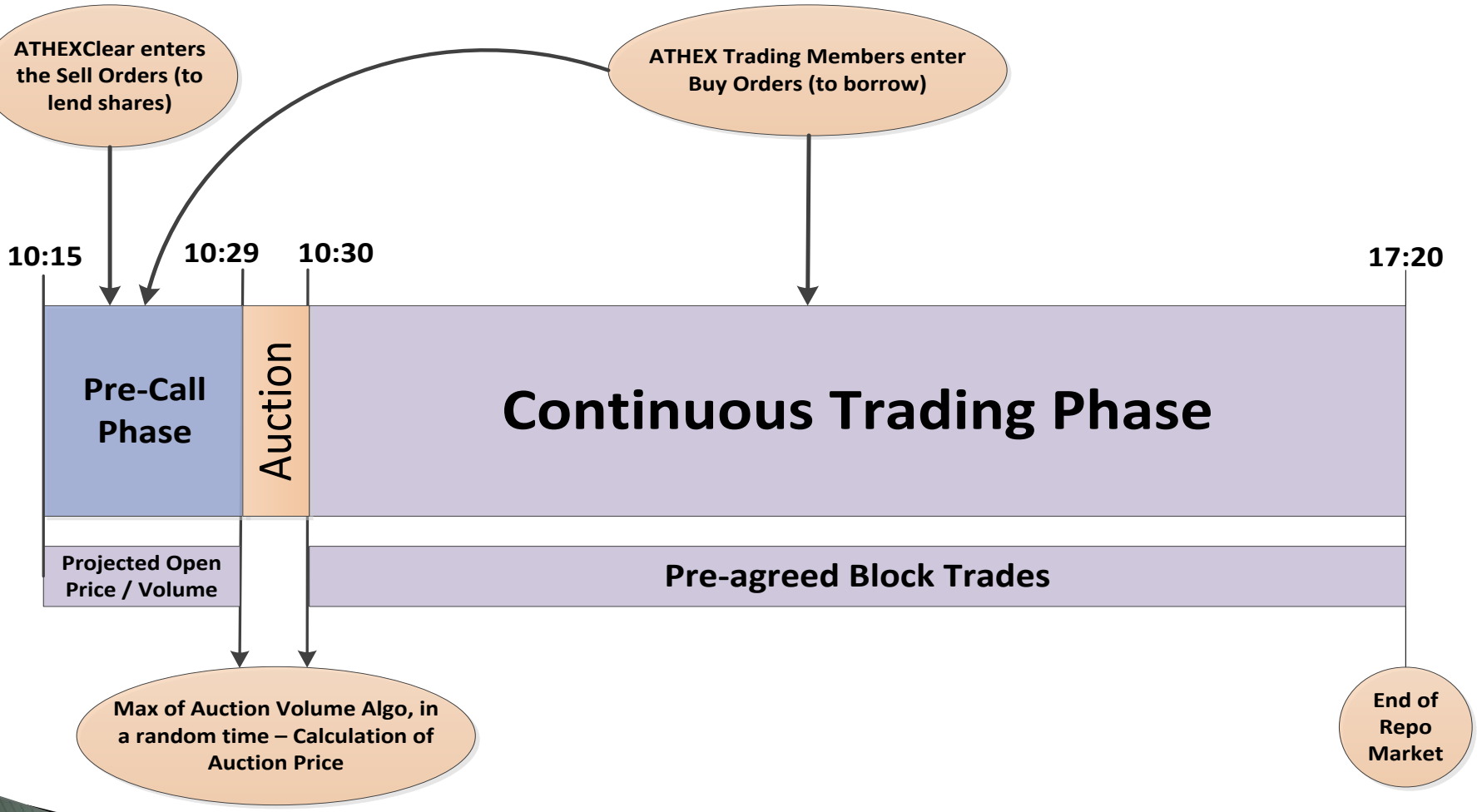
- A participant that is willing to borrow shares, is entering (via his trading member) his Borrow Order (Buy Order) in the OASIS trading system, by stating the volume and the rate

- Then, after a pre-call period in which all Sell and Buy Orders are collected, the trading system runs an opening price algorithm (actually a classic algorithm of volume maximization), determines the opening rate and do the matching of the orders that can be matched. Then all the orders that are not matched are forwarded to a continuous trading phase, where also new Buy Orders can be entered from the trading members.

- Note that at the entry time of any Buy Order, the trading system automatically checks whether the required margin is in place. If not, any Buy Order that its risk is not covered, will be rejected

- ATHEXClear will also accept bilateral pre-agreed repo block trades (high value repo – more than “X” number of shares borrowed)

Basic changes on trading



Clearing and risk management

- ATHEXClear will be the CCP, as it is now
- The Sell Orders (Lending) are not bearing any risk to CCP (no margin required), as the Custody system checks the existence of the shares at the time of lending and blocks them for lending purposes
- The settlement is done on T+0 (afternoon), or even immediately after the trade, since as said it is prerequisite the necessary margin to be in place even before the entry of the Buy Order!
- For the coverage of the Buy Order risk:
  - The ATHEXClear Derivatives Clearing Fund will be used, so only the ATHEXClear Derivatives Clearing Members are participating in the Repo clearing procedures to cover any buy-side risk (margins)
  - Those margins will be allocated as Credit Limits from the clearing members to the trading members and will be used to allow the entry of the Buy Orders from the trading members
  - The Credit Limit that will be covered for the entry of any Buy Order will be equal to the (100% + X%) multiplied by the total value of the shares borrowed. To calculate this value, the system will take into account the start of day price of the stock (ie, previous close price, or maybe adjusted if there was any corporate action)

Calculation and payment of the revenues/interest

- The calculation of the revenue to the lender, will be done by using the current algorithm
- The payment of the revenue to the lenders will be done on a monthly basis
- The interest from the borrowers will be collected on a daily basis
- In both cases, the Target-2 cash accounts of both participants (the Clearing Member of the borrower and the Custodian of the lender) will be used for any cash movements

Exercise from the borrower, or from the lender

The exercise requests (return of shares), either from the lender, or from the borrower, are registered in the ATHEXClear Clearing System

- **Exercise request from the lender**
  - The lender, by putting a application in the clearing system, requests to have the shares back in his shares account
  - ATHEXClear will ask the oldest borrower to return the shares
  - ATHEXClear has to deliver the shares by latest the T+4 from the lenders request
- **Exercise request from the borrower**
  - The borrower, by putting a application in the clearing system, requests to return the shares
  - ATHEXClear receives the shares on T+0 and delivers them to the lender
  - The shares are delivered to the oldest lender


Cash Market
Derivatives Market


Basic
Changes on
Risk, Clearing
& Settlement

Basic changes on risk, clearing & settlement

Members & Users

- **Common Members IDs** for both Cash and Derivatives Markets
- **Common Users IDs**
  - New Clearing users' IDs
  - Common Clearing user ID for both Cash and Derivatives
  - New standardized roles for users' access

Position Handling

(New structure of codes/accounts)

- **Trading Account**: Defined by the Trading Member and entered at the entry of an order
- **Position Account:** Defined by the Clearing Member and is used to manage end-client position
- **Clearing Accounts & Sub-accounts:** Defined & operated by the Clearing Member.

*Risk of Clearing Account (and required margin) comes from the total position of all clearing sub-accounts that are related to this.

Types of accounts

Trading Account

It is defined by the Trading Member and entered upon entry order

- Concerns a specific investor
- There is a relation between a trading account of a trading member and a position account, therefore each transaction ends up to one position account

Position Account

It is defined by the Clearing Member and is used to manage end-client position

- Positions Account is related to one or more Trading Accounts of the Trading Member
- Positions Account corresponds to one and only Investor Account (an account in CSD)
- Clearing Member defines the relations between trading accounts and positions accounts
- Each position account should be linked to one and only clearing sub-account

Clearing Accounts & Sub-accounts

Defined & operated by the Clearing Member

- Each position account is related to one Clearing sub-account. Clearing sub-account risk resulting from the total position accounts that they belong to it and they are calculated for information reasons to the Member.
- Each clearing sub-account could be related to only one Clearing account. Many clearing sub-accounts could be related to the same Clearing Account.
- Risk of Clearing Account (and required margin) comes from the total position of all clearing sub-accounts that are related to this.

Clearing and position management

TRADING CODES

POSITION ACCOUNTS

CLEARING SUB ACCOUNTS

CLEARING ACCOUNTS

TM 1

OWN

MMCL

MMETF

ERROR

1

2

3

4

TM 2

3

4

5

6

CM

OWN Λ.Α

MMCL Λ.Α

MMETF Λ.Α

ERROR Λ.Α

1 Λ.Α

2 Λ.Α

3 Λ.Α

4 Λ.Α

5 Λ.Α

6 Λ.Α

SCA 1

SCA 2

SCA 3

SCA 4

SCA 5

CA 1

CA 2

CA 3

CA 4

Margin CA 1

Margin CA 2

Margin CA 3

Margin CA 4

Guarant. CA 1

Guarant. CA 2

Guarant. CA 3

Guarant. CA 4

New risk management model

Risk Management

- **Derivatives Market Clearing Fund is:**
  - The sum of the contribution of each clearing member
  - Calculated on a monthly basis (ad-hoc calculations if necessary)
- **Margin is:**
  - Calculated daily for each Clearing account following the existing methodology (RIVA)
  - Taking into consideration the calculation of all collaterals that are deposited to the Clearing Account
- **Intraday Margin:**
  - When a transaction is realized the credit limit of the trading Member is reduced accordingly. The risk management system performs on frequent time periods intraday margin calculations (e.g. every 15') at a position account level.
  - If it is calculated that the "consumed" credit limit is higher than the actual risk increase, the difference will be "returned" to the Clearing Member as extra credit limit in the clearing account.

ATHEXClear counterparties

- Only Clearing Members (and not investors) are exclusively counterparties of ATHEX Clearing House
- Display of positions' account per investor's level is provided by ATHEX Clearing House to all Clearing Members

Margin

- Margin is calculated daily for each Clearing account following the existing methodology, called RIVA
- Taking into consideration the calculation of all collaterals that are deposited to the Clearing Account, the required cash margin is defined.
- Clearing Member has the obligation to deposit to ATHEX Clearing House, for each Clearing Account the relative cash margin.

Intraday margin

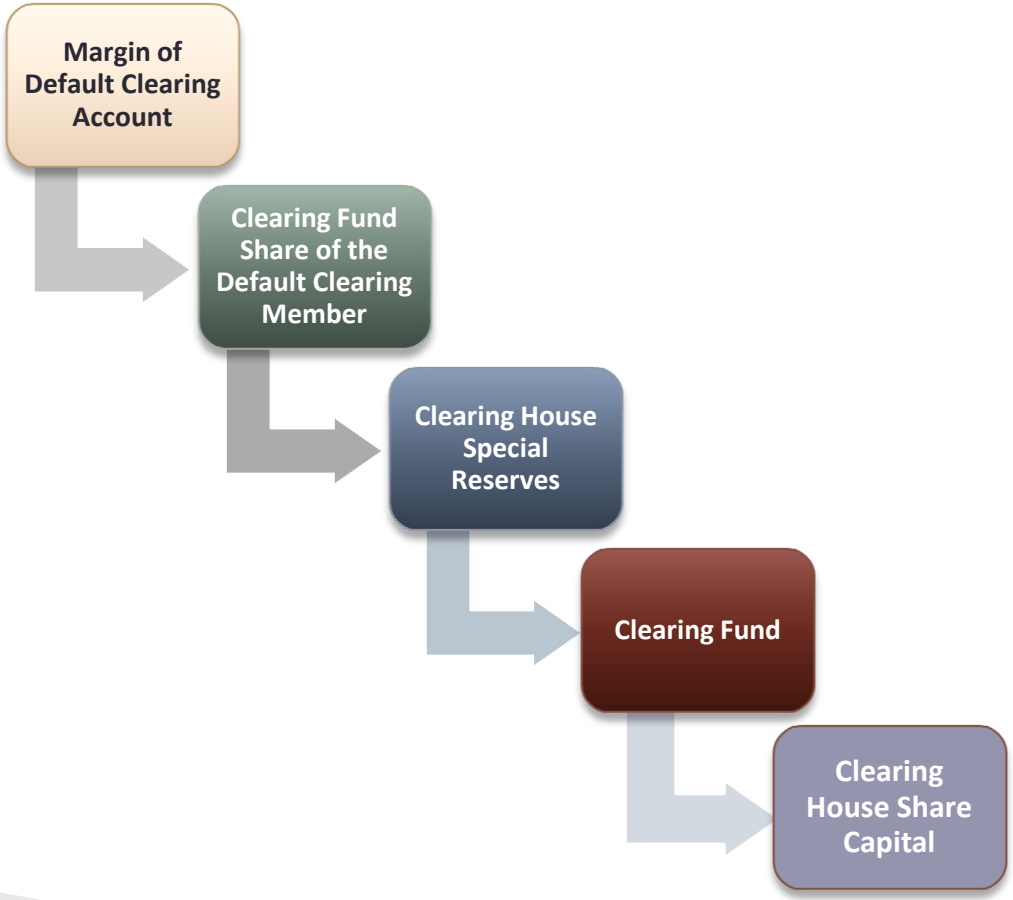
- At the Derivatives Market, when a transaction is realized the credit limit of the trading Member is reduced accordingly. In reality, the risk may be also reduced as this transaction may lead to the closing of an open position. As a consequence, the function of intraday margin calculation is introduced.
- The risk management system performs on frequent time periods intraday margin calculations (e.g. every 30') at a position account level.
- If it is calculated that the "consumed" credit limit is higher than the actual risk increase, the difference will be "returned" to the Clearing Member as extra credit limit in the clearing account.

Implementing the intraday margin calculation function, the following are achieved:

- Better risk monitoring on behalf of ATHEXClear and Clearing members
- Reduction of credit limit consumption in case of netting
- More efficient utilization of Clearing Members' guarantees and cost reduction
- Compliance with international practices and guidelines (requirement about intraday margin)

Use of resources in case of default

The following graph shows the consequence of use of funds in case of Clearing Members' default

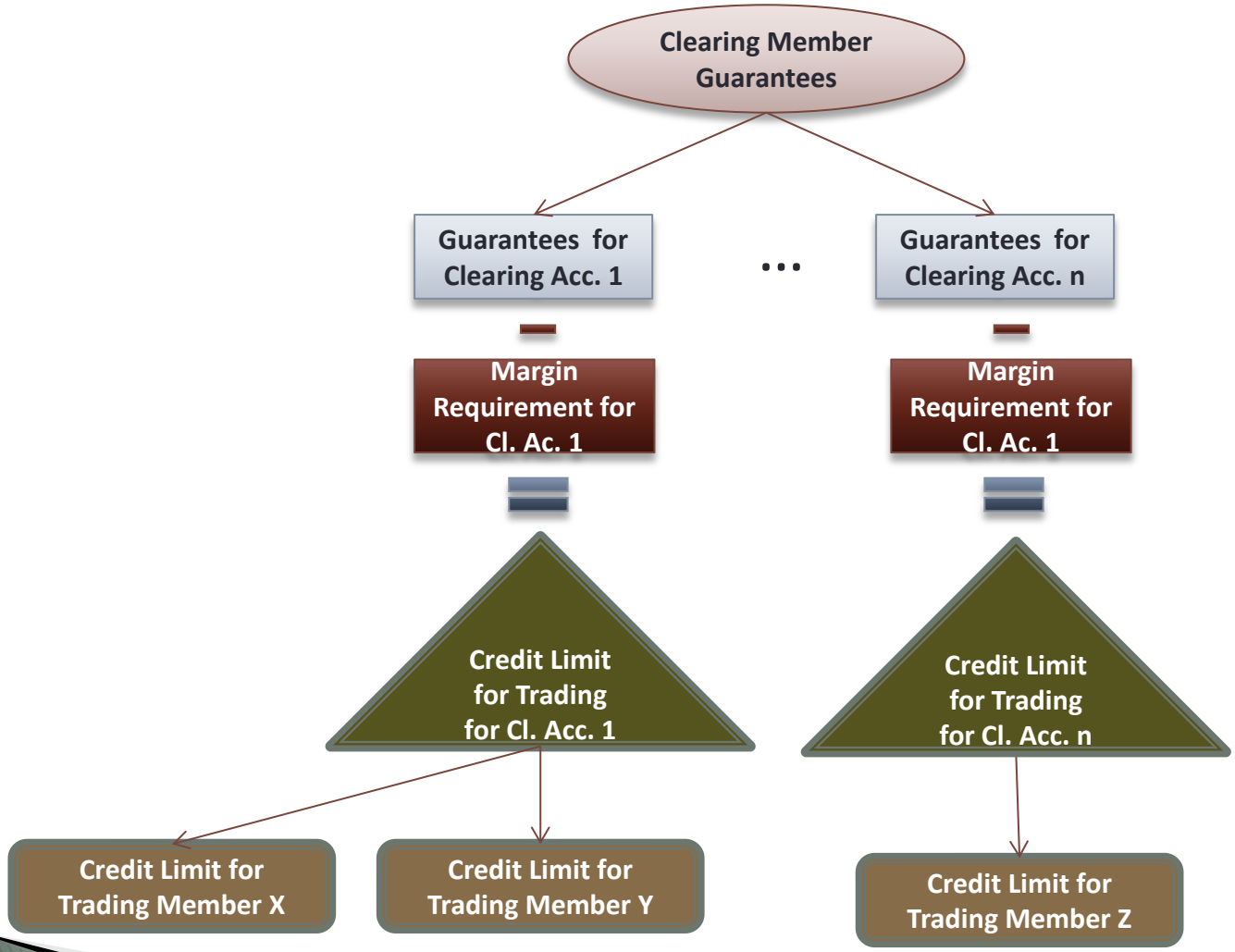


Introduction of Clearing Fund

Clearing Fund for Derivatives Market (existing in Cash Market)

- It is the sum of the contribution of each clearing member
- It is calculated on a monthly basis (ad-hoc calculations if necessary)
- It covers a potential default of the biggest member or the default of second and third member
- It follows the EMIR Regulation standards

Credit Limit for trading in Derivatives Market



Trades handling

Trades Handling

- **Trades Uploading** from the trading system (OASIS) to the Clearing System
- **Shaping procedure**:
  - on behalf of Trading Member till a specific time during the trading day
  - on behalf of Clearing Members till a specific time during the trading day
- **Give-up procedure**
- **Trades finalization:** is realized by the end of the period where cancellation and shaping procedures are allowed. After this, Clearing Members' obligations and credit limits are calculated.
- **Physical Delivery Give-up**

Trades life cycle

- **Trades Uploading from the trading system (OASIS) to the Clearing System**. View of «estimated positions» taking into consideration the new transactions
- **Trades cancellation ONLY** by Athens Exchange during the trading day or to the Clearing system after the end of trading session.
- **Shaping procedures** on behalf of Trading Member till a specific time during the trading day
- **Shaping procedures on behalf of Clearing Members** till a specific time during the trading day
- **Trades finalization** is realized by the end of the period where cancellation and shaping procedures are allowed. After this, Clearing Members' obligations and credit limits are calculated.
- **Elimination of the rectification** possibility during next day

Relative information

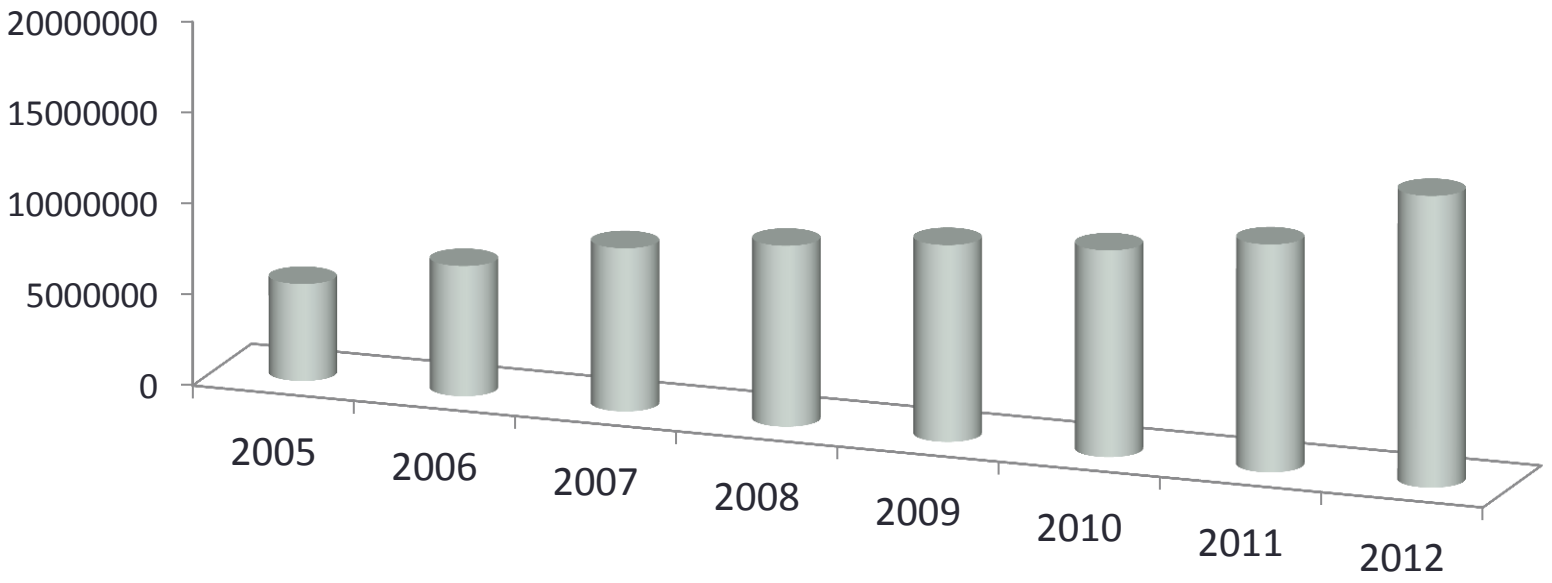
- You can find all the related presentations, documents and software at the www.athex.gr/oasis website and more specifically at the section:

RE-INNOVATING THE ATHEX DERIVATIVES MARKET

Appendix

Derivatives Market Statistics (1/2)

The trading volume of the Derivatives Market continued to rise during 2012 reaching the number of 16,024,344 contracts



Derivatives Market Statistics (2/2)