

Impact of Central Clearing from a CCP perspective

ECB Bond Market Contact Group

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The macro-economic environment and fundamental regulatory reforms are driving changes in the markets, at Exchanges and CCPs

Macroeconomic environment

Quantitative Easing and **low interest rate environment** continue to drive search for yield in **new products and markets**

Volatility will continue as a theme in equities due to high likelihood of further political and macroeconomic disruptions

Increasing regional divergence in Europe (e.g. Brexit) along with lack of yield and volatility in Fixed Income will create **further demand for derivatives** as risk management tools

Fundamental regulatory reform

Capital requirements, regulatory costs and profitability challenges **push sell-side intermediaries into agency models**

Clearing and trading obligation and best execution requirements will **pull buy-side into central infrastructures**

Third-country equivalence and open non-discriminatory access regimes will **create level playing field and attract new entrants**

The financial markets, participants and infrastructures are going through significant structural change

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Increased systemic importance of CCPs

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Variation Margin (VM) and Initial Margin (IM) concept

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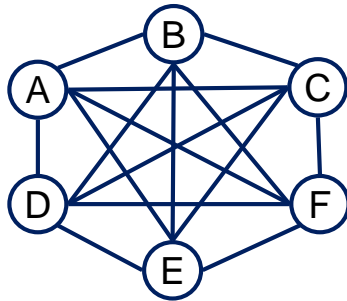
New participants at CCPs including more direct buy-side members

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Less perfect hedge structure but significantly higher hedge efficiency

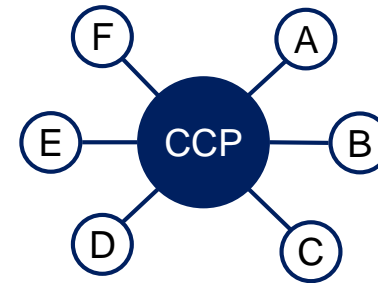
1 CCP services improve soundness of market infrastructure and strengthen market integrity

Bilateral trading & clearing



Bilateral trading & multilateral clearing

CCP market structure - 1:1 relationships between CM and CCP



Benefits of multilateral clearing with Central Counterparty

① Reduced systemic risk

- CCP takes over counterparty risk through trade novation
- CCP enforces strict risk control and adequate collateralisation of open positions
- Automatic multilateral netting reduces gross risk exposure
- CCP mutualizes risk across entire member space effectively reducing impact of extreme events
- CCPs facilitate recovery and resolution

② Increased transparency

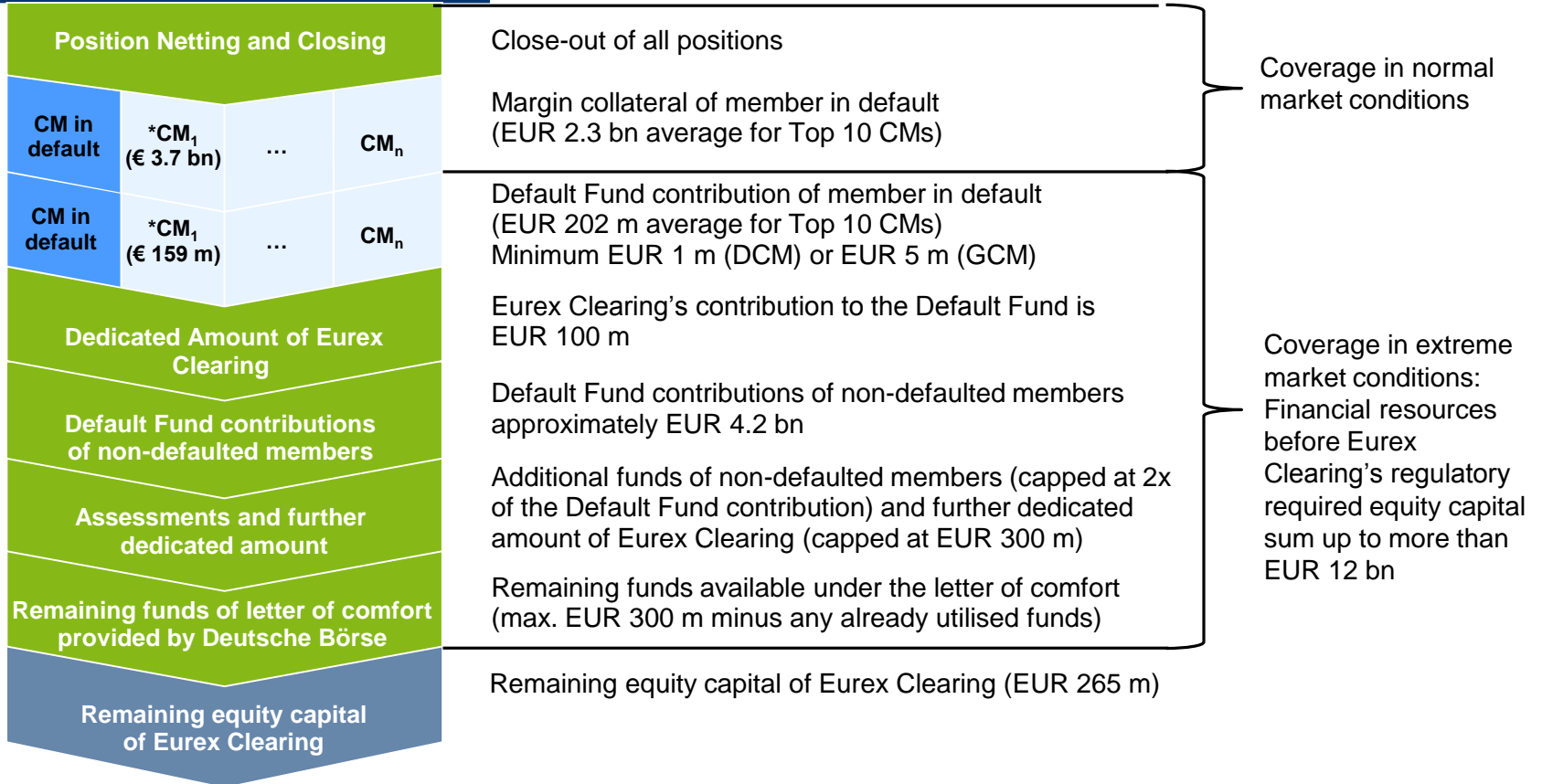
- Awareness of concentration risk
- Independent position valuation by neutral institution
- Early warning function by daily mark-to-market

③ Efficiency gains

- Full automation and straight-through processing reduces manual errors
- Efficient use and management of collateral
- Increased capital efficiency by reduced balance sheet exposure

1 Lines of defense waterfall ensures loss coverage in normal and extreme market conditions - Incentives are rightly managed

Eurex Clearing Lines of Defense



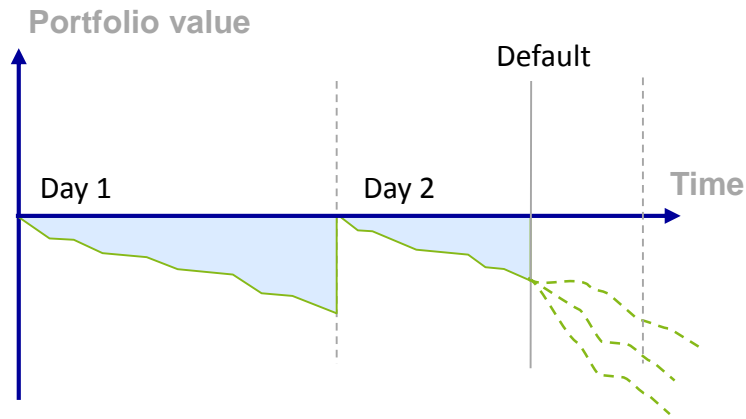
* Largest Clearing Member by TMR.

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Variation Margin (VM) and Initial Margin (IM) concept

Variation Margin (VM)

- Collateralizes current exposure
- Real-time intra-day enforcement
- Accumulated VM is paid out daily, resetting position value to zero

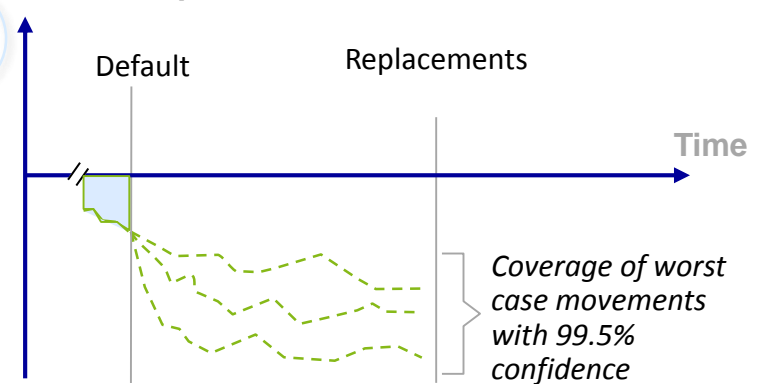


VM closely tracks market movements

Initial Margin (IM)

- Collateralizes potential exposure until replacements
- Daily enforcement base on expected future market movements

Potential portfolio value after default

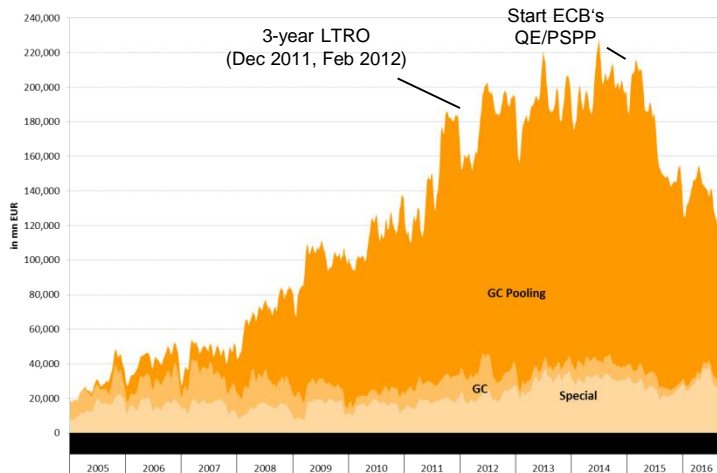


IM covers worst case close out costs

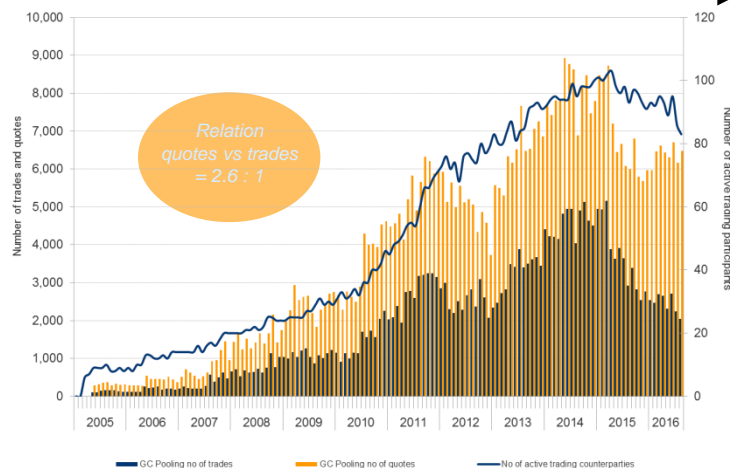
Functioning and liquid bond and repo markets are an important facilitator for buy and sell side participants to support VM and IM concept

Consolidation of GC Pooling volumes on high level due to excess liquidity created by ECB's QE/PSPP

Average outstanding volume on Eurex Repo*



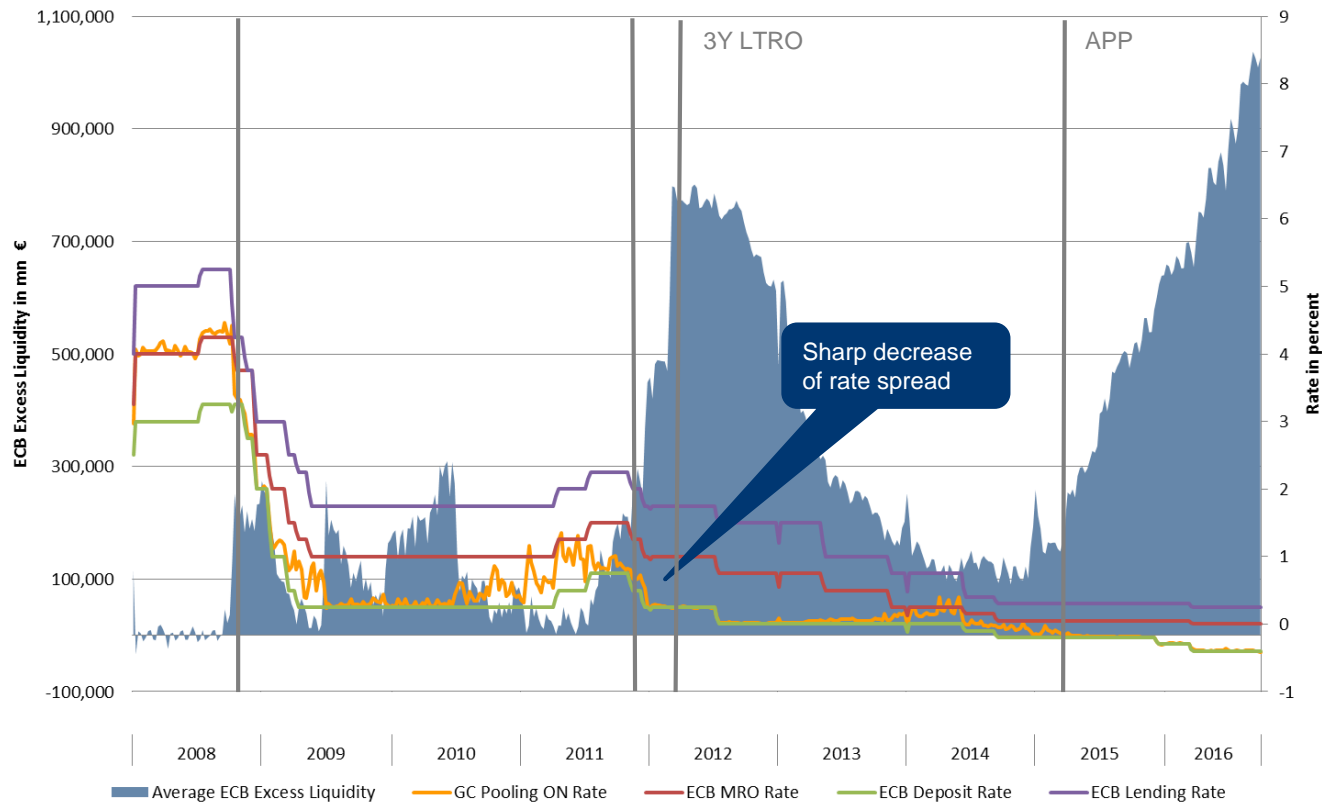
Continuous growth of quotes & trades on GC Pooling



Key figures

- Daily outstanding volume record € 245.9 bn reached on June 12, 2014
 - Outstanding volume decrease -21.4%: € 117.4 bn average outstanding volume in August 2016 (€ 149.3 bn in August 2014)
 - Continuous growth – CAGR = 35.6% (2005-2015)
 - As per previous monetary interventions, since start of ECB's QE programme in March 2015 declining volumes in GC Pooling and Euro Repo Market
 - In addition, uncertainty in financial markets (e.g. Greece, Italy and China) and regulatory changes may lead to further reduction in bank's funding activities
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- Although recent drop in volumes, GC Pooling continues to be a highly liquid market with quote vs. trade ratio of 2.6:1
 - Average active trading participants
2015: 97 participants; 2016: 91 participants
Q1/16: 93 participants; Q2/16: 92 participants;
 - Average trades per month
2015: 3,713 trades; 2016: 2,459 trades
Q1/16: 2,570 trades; Q2/16: 2,559 trades
 - Average quotes per month
2015: 6,853 quotes; 2016: 6,389 quotes
Q1/16: 6,346 quotes ; Q2/16: 6,481 quotes

Extreme accumulation of excess liquidity carries negative side effects for interbank lending activity



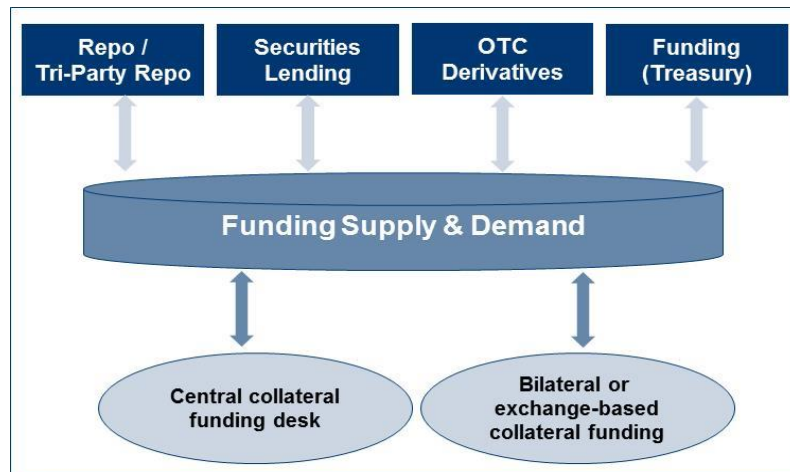
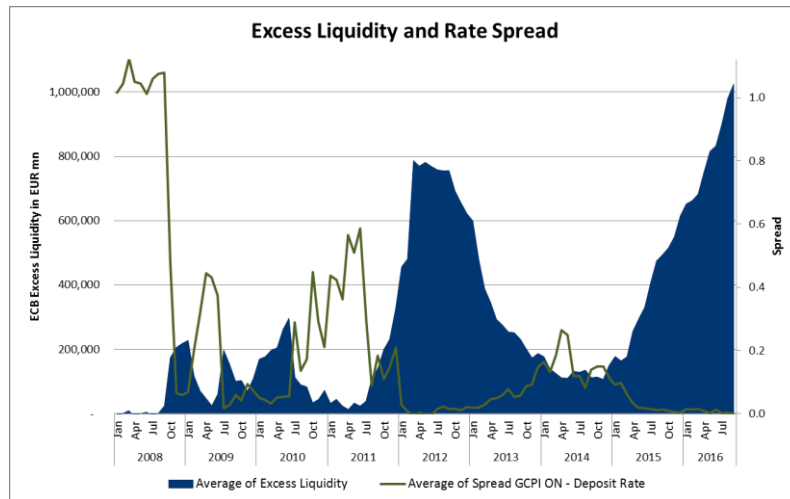
*weekly average

- Central bank liquidity key driver of GC Pooling repo rates
- ECB excess liquidity increase of around EUR 900 bn since the beginning of the APP
- ECB's liquidity injections create imbalance between supply and demand
 - demand for liquidity in the interbank market decreases

* Given negative interest rates the impact of ECB excess liquidity during the PSPP even higher than during the 3Y LTRO's in 2011/2012.

ECB's QE/PSPP with significant impact on funding and financing activities and desk structures

Current market situation



ECB's Public Sector Purchase Programme (PSPP)

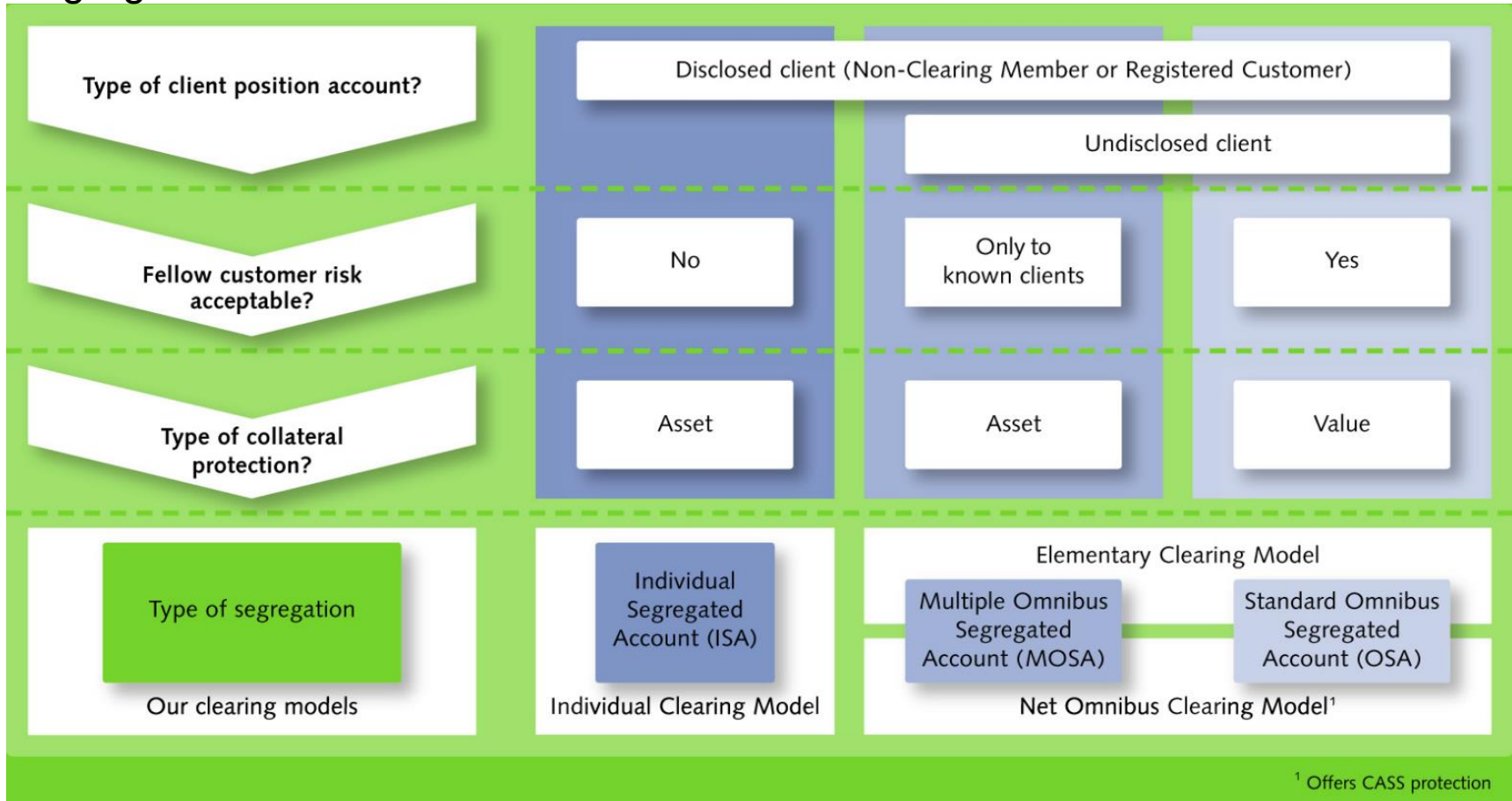
- In March 2015 the Eurosystem started to buy public sector securities under the PSPP with cash supply in total of EUR 1,600 billion until 03/2017 (avg. 80 bn/months).
- By the end of September 2016, about EUR 1,000 billion excess liquidity have been provided to the market under the PSPP
- Securities purchased under the PSPP are made available for securities lending to support market liquidity and collateral availability in the market

Market impact

- Cash taker's need for short term funding has been reduced significantly; profit margin for cash providers in money market drops below zero risk investment at ECB deposit facility
- In addition, markets shifting to non-CCP markets (bilateral and tri-party) with lower quality collateral whilst CCPs are required to rigorously implement regulatory changes (e.g. risk parameters)
- Central banks currently evaluating lending programmes in order to avoid collateral squeeze
- QE enforces structural changes already happening within sell- and buy-side firms to centralised collateral funding desks

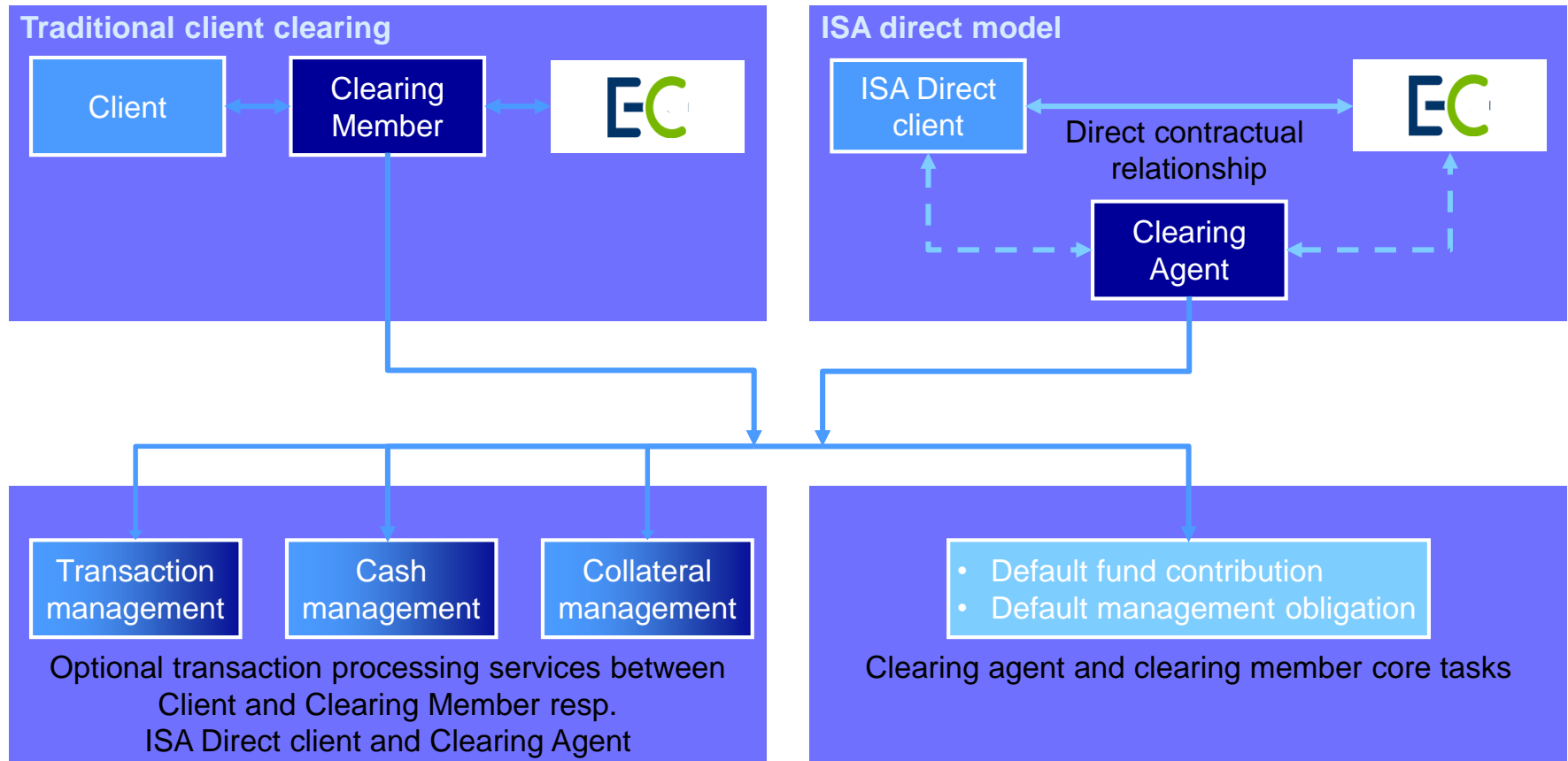
3 Eurex Clearing offers a variety of segregation models to address the needs of different client types

Segregation Decision Matrix



3 Overview of ISA Direct model

ISA Direct model combines elements of direct clearing membership and the traditional service relationship in client clearing, tailored specifically for the buy side.





Thank You

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Backup

Eurex Clearing's Credit Risk Management Framework

Overview of major areas within CCP Risk Management

Counterparty Assessment

- Eurex Clearing has strict criteria for counterparties to guarantee that clearing members, payment banks, treasury counterparts have sufficient credit quality and financial strength
- Credit assessments are repeated on a regular basis

Collateral and Member Monitoring

- Eurex Clearing only accepts secure, liquid and accessible collateral with low credit risk
- A comprehensive risk management framework has been established in order to identify, manage and control credit, concentration and wrong way risks

Margining

- Margin requirements are aimed to cover potential losses arising during the default management process according to the "defaulter pays" scheme
- Margin requirements are monitored and enforced intraday

Stress Testing

- Additional post-default backings are available to cover risks beyond the margin confidence level
- The adequacy of the Clearing Fund size, Eurex Clearing's total financial resources and liquid financial resources is verified by means of stress tests

Default Management Process

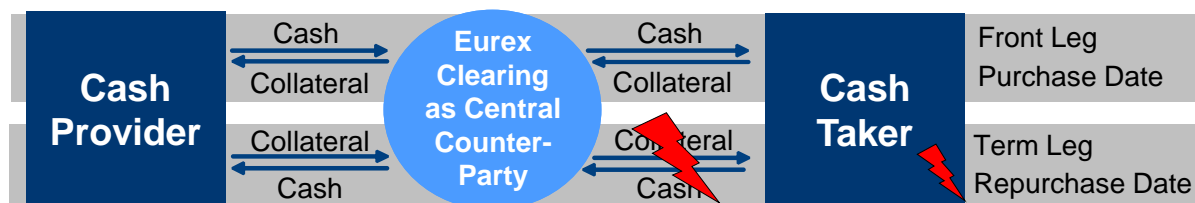
- When a Clearing Member goes into default, one of Eurex Clearing's principle objectives is to protect customers and minimize harm to clients and their positions
- Losses to the CCP's lines of defense and the disruption of the wider market are minimized

Two step liquidation needed for repo transactions

Overview of general liquidation process

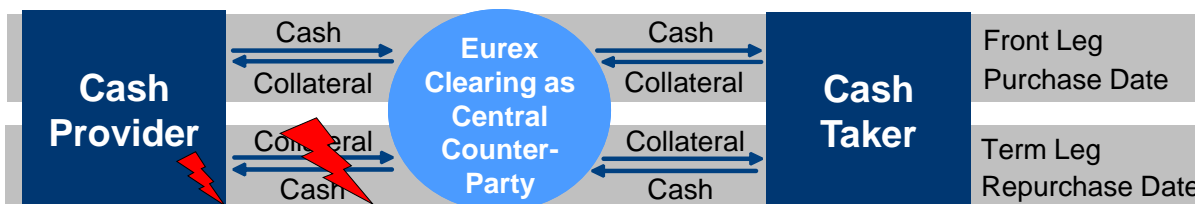
- Due to the product characteristics of repo transactions, the DMP requires two steps:
 - the CCP needs to enter into a repo transaction replacing the one terminated with the defaulted clearing member, and
 - the CCP needs to buy or sell the underlying bond in the market.

- Cash taker default in a repo transaction:



If a cash taker defaults, Eurex Clearing acts as cash provider/ collateral taker in the frontleg of the replacement repo (performing a 'reverse repo'), and sells the underlying bond in the markets.

- Cash provider default in a repo transaction:



If a cash provider defaults, Eurex Clearing acts as cash taker/ collateral provider in the frontleg of the replacement repo (performing a 'repo'), and buys the underlying bond in the markets.

- At maturity of the term leg, the underlying bond and cash are exchanged via Eurex Clearing by the non-defaulted counterparty of the initial repo and the counterparty of the replacement repo.
- The liquidation process is aiming to be completed within 5 business days after termination of the clearing license.
- The process for the securities lending service is similar, considering the product specifics.

Breakdown of repo related bond exposure*

The bond exposure across all repo types (GC Pooling, GC Repo and Special Repo) to be sold in default cases is in general of high quality, while with some higher exposures exist towards government bonds of Spain and Italy.

		ECB Issuer Group									
		IG2	IG3	IG4	IG5	IG6	IG7	IG8	IG9	IG11	Total
Issuer Residence	Austria (AA+)	0.5	0.3	0.9						0.0	1.7
	Belgium (AA)	2.3		0.1							2.4
	Canada (AAA)			0.4					0.0		0.4
	Czech Republic (A+)		0.0								0.0
	Denmark (AAA)			2.9							2.9
	Finland (AA+)	0.2	0.0	0.2					0.1		0.5
	France (AA)	1.3	0.1	2.5			0.7	0.1	0.0		4.6
	Germany (AAA)	14.0	0.0	2.0	7.3		9.1	4.4	0.0		36.9
	Iceland (BBB+)		0.2								0.2
	Ireland (A)	0.2									0.2
	Italy (BBB-)	7.8	0.2	0.0	0.3						8.4
	Luxembourg (AAA)	0.0		0.2							0.3
	Netherlands (AAA)	0.7	0.2	0.4					0.1		1.5
	Norway (AAA)		0.0	0.5							0.5
	Poland (BBB+)	0.4									0.4
	Slovakia (A+)	0.5									0.5
	Slovenia (A)	0.0									0.0
	Spain (BBB+)	7.1	1.4	2.0	0.1			0.4			10.9
	Supranational					4.9					4.9
	Sweden (AAA)		0.0	0.5							0.5
	Switzerland (AAA)			0.1							0.1
	United Kingdom (AA)		0.0	1.6					0.0		1.6
	United States (AA+)		0.0						0.2		0.2
Grand Total		35.1	2.3	14.5	7.8	4.9	9.7	4.8	0.4	0.0	79.6

- IG2 Central Government
- IG3 Corporates
- IG4 Credit Institutions (excl Agencies)
- IG5 Regional / Local Government
- IG6 Supranational Issuers
- IG7 Agency – Non Credit Institutions
- IG8 Agency – Credit Institutions
- IG9 Financial Corporations other than Credit Institutions
- IG11 Public Corporations