

Compressing Over-the-counter Markets

Marco D'Errico¹

Tarik Roukny²

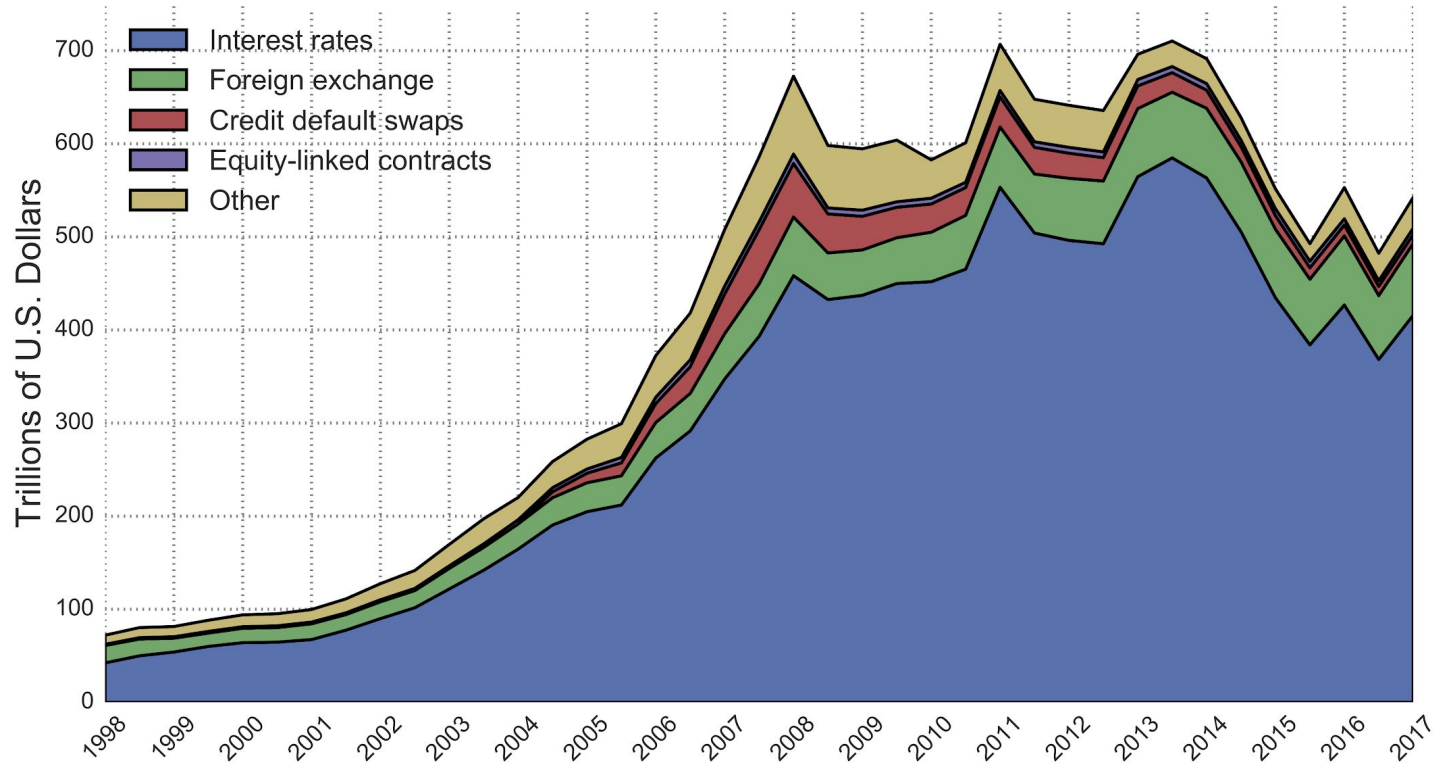
¹ European Systemic Risk Board

² KU Leuven

EBA Policy Research Workshop

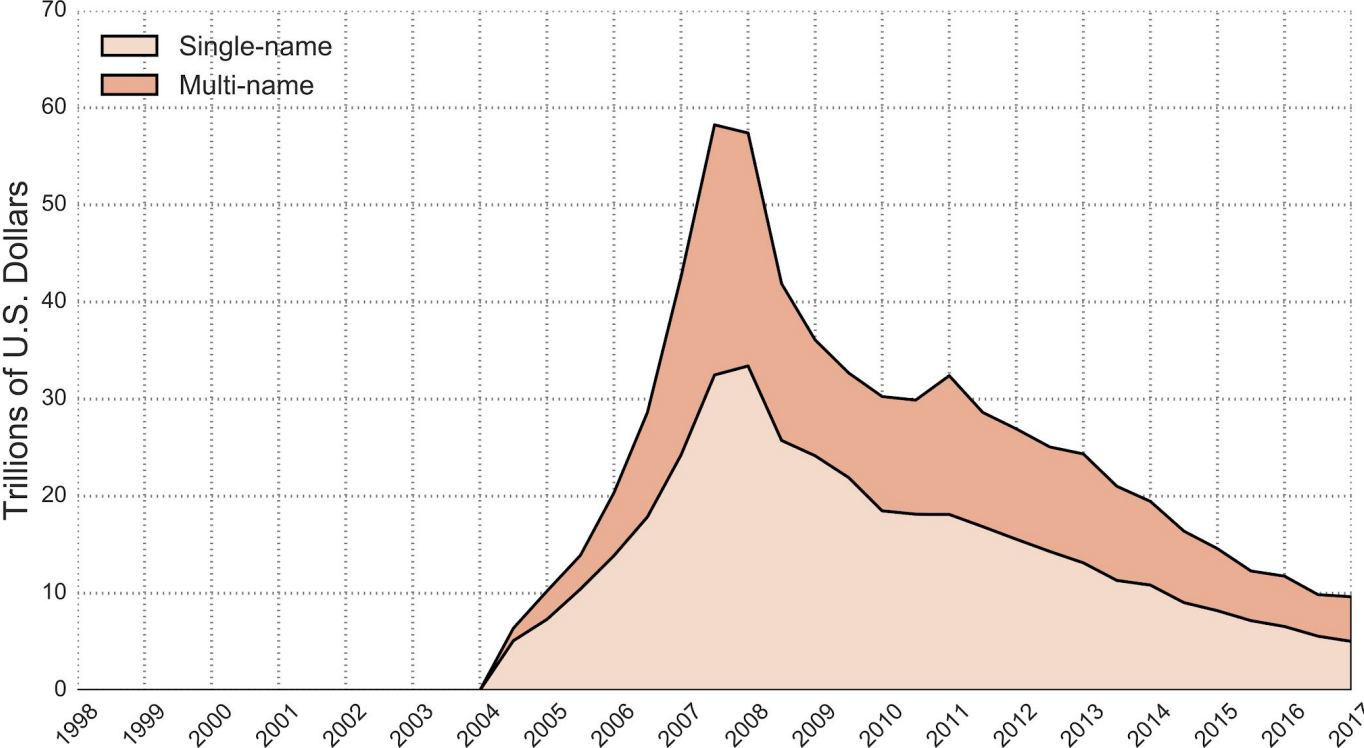
Nov 13 2020

Size of OTC derivatives markets



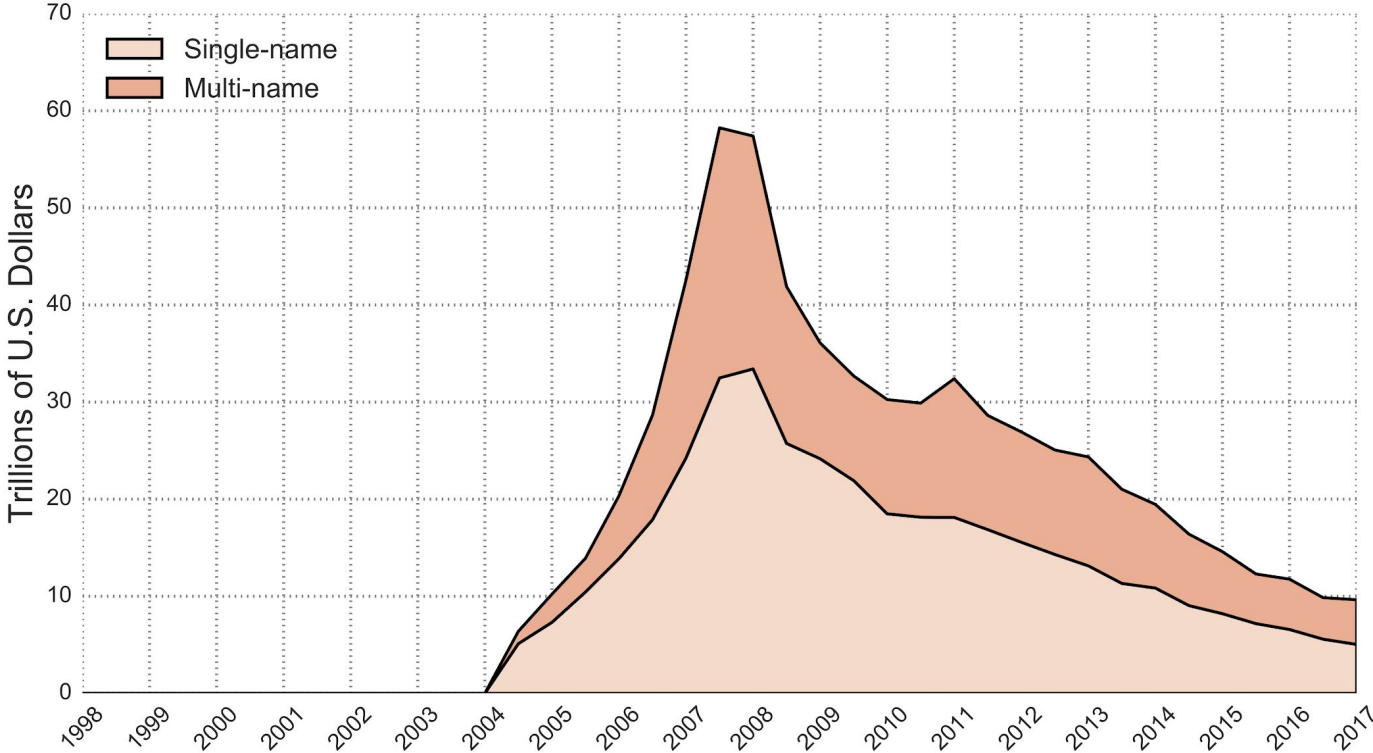
Source: BIS OTC derivatives statistics

Size of OTC CDS markets



Source: BIS OTC derivatives statistics

Size of OTC CDS markets



Source: BIS OTC derivatives statistics




What drives this reduction in size?



Clearing and settlement + Add to myFT

OTC derivatives shrink to lowest level since financial crisis

Banks utilise trade compression strategy which has been 'key driver' in fall, according to BIS



© Getty

Joe Rennison in New York MAY 5, 2016

1

*“Banks attempting to limit the impact of new requirements have turned to a tool known as **trade compression** [...]*

The tool was a “key driver” of the fall in outstanding notional.”

Financial Times, May 5, 2016



The credit default swap market: what a difference a decade makes



BIS Quarterly Review | June 2018 | 05 June 2018

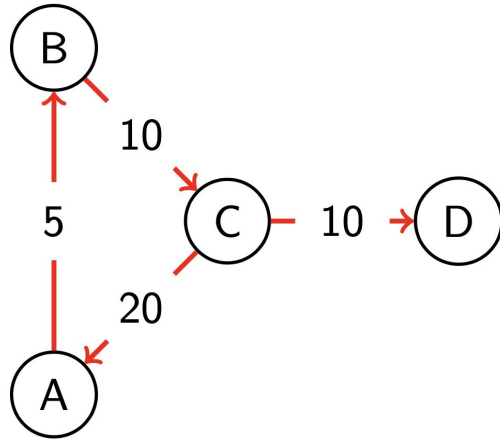
by [Iñaki Aldasoro](#) and [Torsten Ehlers](#)

“Outstanding notional amounts of credit default swap (CDS) contracts fell markedly, from \$61.2 trillion at end 2007 to \$9.4 trillion 10 years later.

*During the Great Financial Crisis (GFC) and its aftermath this was driven by **portfolio compression**”*

Portfolio compression

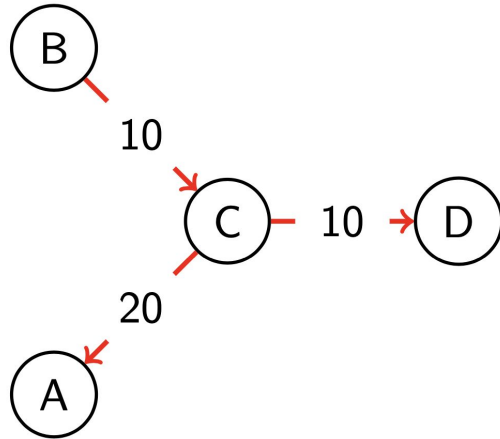
Post-trade technology that reduces gross positions while maintaining net balances



<u>Gross</u>	<u>Net</u>
$V_A^g = 25$	$V_A^n = -15$
$V_B^g = 15$	$V_B^n = +5$
$V_C^g = 40$	$V_C^n = +20$
$V_D^g = 10$	$V_D^n = -10$
$V^g = 45$	$V^n = 0$

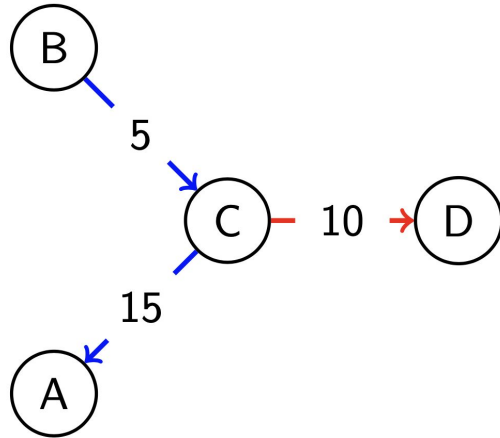
Portfolio compression

Post-trade technology that reduces gross positions while maintaining net balances



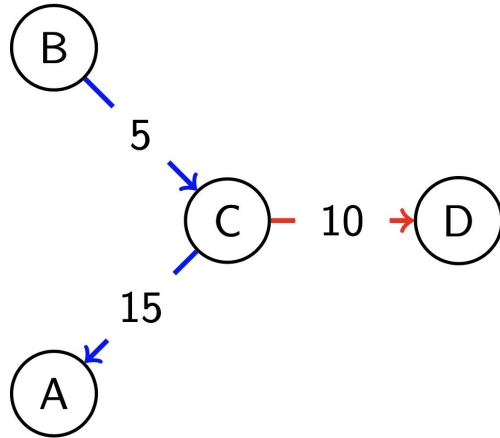
Portfolio compression

Post-trade technology that reduces gross positions while maintaining net balances



Portfolio compression

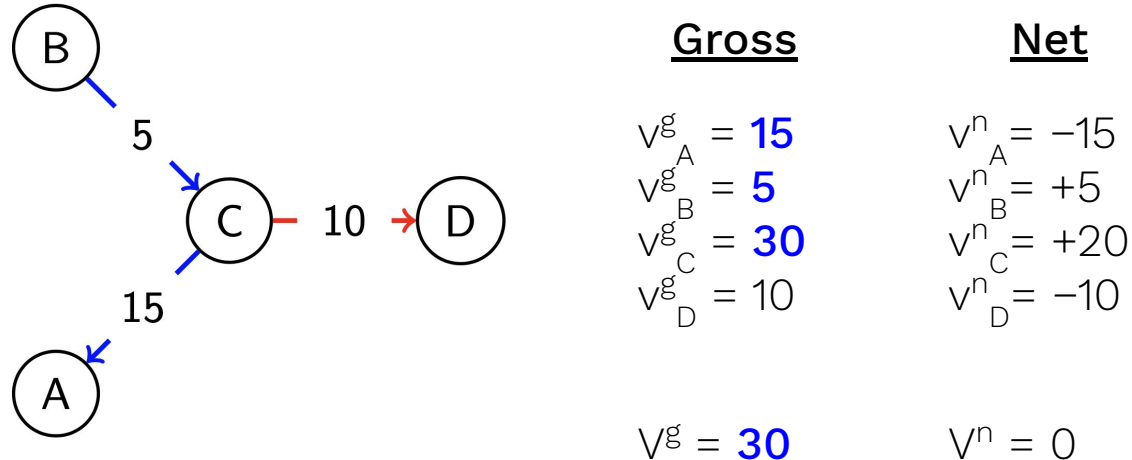
Post-trade technology that reduces gross positions while maintaining net balances



<u>Gross</u>	<u>Net</u>
$V_A^g = 15$	$V_A^n = -15$
$V_B^g = 5$	$V_B^n = +5$
$V_C^g = 30$	$V_C^n = +20$
$V_D^g = 10$	$V_D^n = -10$
$V^g = 30$	$V^n = 0$

Portfolio compression

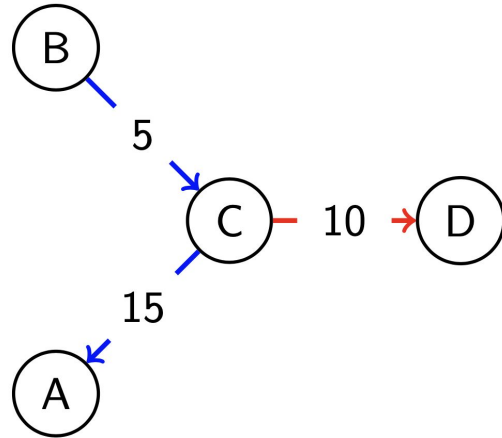
Post-trade technology that reduces gross positions while maintaining net balances



Reduction in aggregate gross notional: 15

Portfolio compression

Post-trade technology that reduces gross positions while maintaining net balances



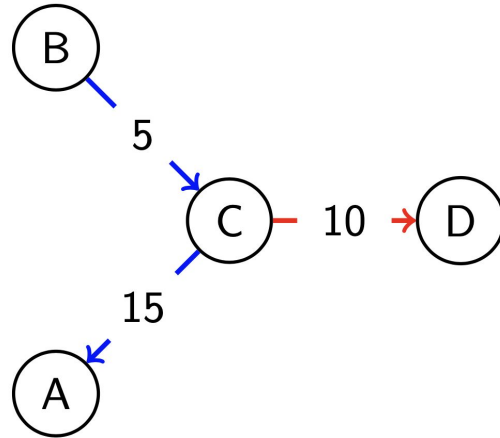
<u>Gross</u>	<u>Net</u>
$V_A^g = 15$	$V_A^n = -15$
$V_B^g = 5$	$V_B^n = +5$
$V_C^g = 30$	$V_C^n = +20$
$V_D^g = 10$	$V_D^n = -10$
$V^g = 30$	$V^n = 0$

Remark 1

Over-the-counter markets exhibit some redundancy in notional

Portfolio compression

Post-trade technology that reduces gross positions while maintaining net balances



<u>Gross</u>	<u>Net</u>
$V_A^g = 15$	$V_A^n = -15$
$V_B^g = 5$	$V_B^n = +5$
$V_C^g = 30$	$V_C^n = +20$
$V_D^g = 10$	$V_D^n = -10$
$V^g = 30$	$V^n = 0$

Remark 2

Compression is a multilateral novation netting technique that does not require a Clearinghouse or Central Counterparty

Why compress?

2008 Crisis aftermath (1)



“Only now is the industry discovering the joys of compression”

The Economist, November 2008

Why compress?

2008 Crisis aftermath (2)

New Regulatory Framework



Capital requirements

Leverage ratio

Collateral management



Demand for new post-trade services

(Duffie, 2017),(FSB,2017)

Why compress?

2008 Crisis aftermath (2)

New Regulatory Framework



Capital requirements

Leverage ratio

Collateral management



Demand for new post-trade services

(Duffie, 2017),(FSB,2017)

New role for compression

System wide multilateral deleveraging operation which does not entail asset sales or capital injection

Taking stock

How?

Bilateral level → Mutual agreement

Multilateral level → External service provider

TriOptima, LMRKTS, Quantile, Capitalab

How much?

TriOptima (TriReduce): \$1,855 trillion (2003-2020)

ISDA: 67% reduction of IRD markets (2010-2016)

Regulation

Defined in MiFIR / Dodd-Franck

Supported adoption under EMIR and Dodd-Franck

However...

Limited literature and analytical research on the topic

(O'Kane, 2014 QF)

Policy: Benos et al. (2013), Schrimpf (2015), Abad et al. (2016), Duffie (2017, 2018), Aldasoro and Ehlers (2018)

New Working papers: Veraart (2019), Schuldenzucker and Seuken (2019), Amini and Feinstein (2020)

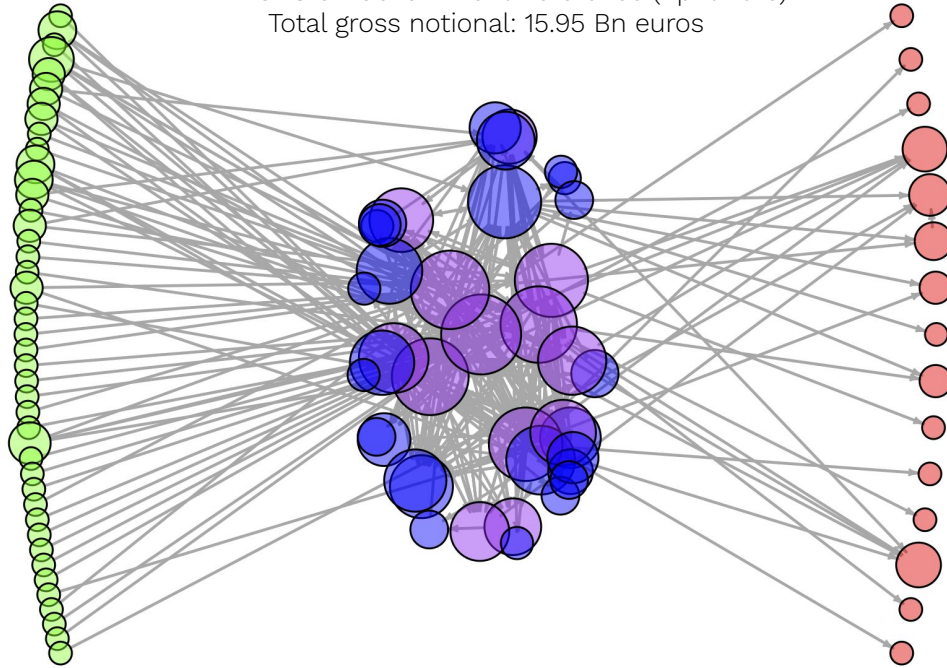
Today

1. Formalize key concepts related to portfolio compression
 - Excess
 - Tolerance
2. Identify the mechanics of compression
 - Condition: fungibility and intermediation
 - Efficiency: tolerance trade-off
 - Topological characterization
3. Apply the framework to CDS markets
 - Large notional levels eligible for compression
 - Large impact of a EU-wide adoption of compression services
 - Interaction with central clearing
4. Policy implications

OTC Networks

Dealers and customers

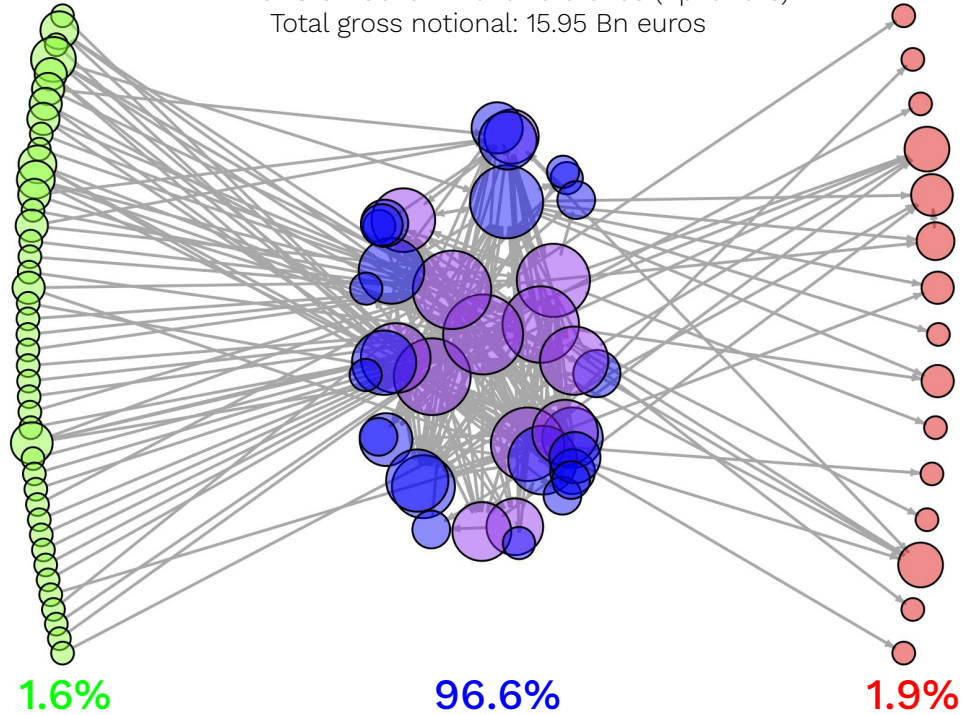
EMIR CDS on Government Reference (April 2016)
Total gross notional: 15.95 Bn euros



OTC Networks

Dealers and customers

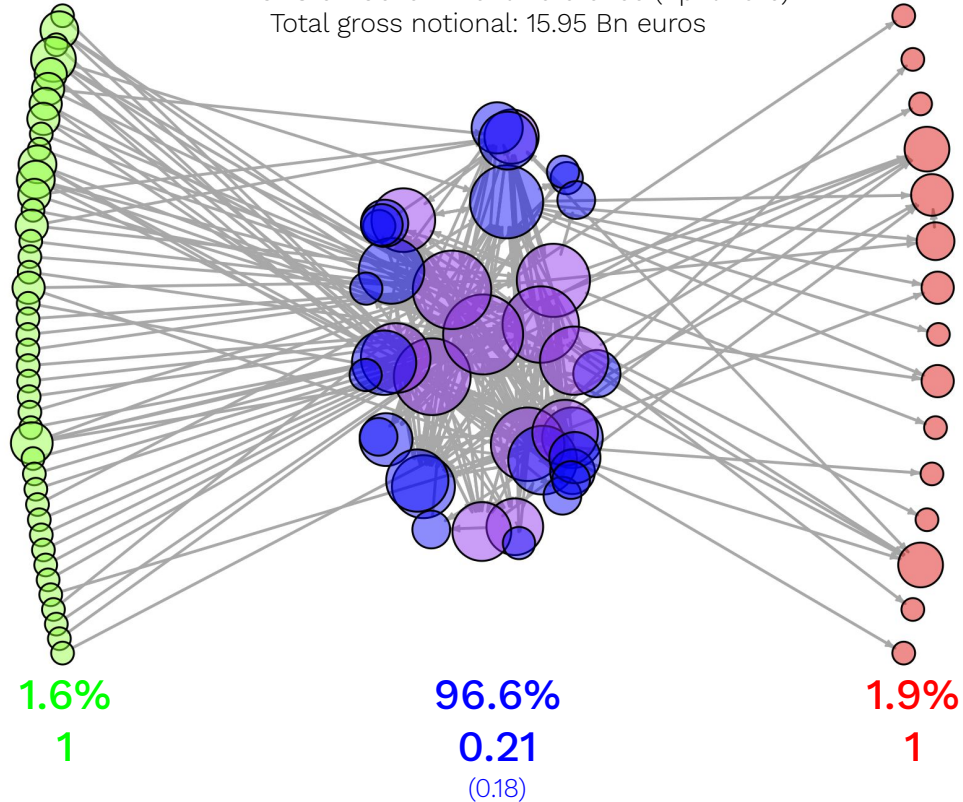
EMIR CDS on Government Reference (April 2016)
Total gross notional: 15.95 Bn euros



OTC Networks

Dealers and customers

EMIR CDS on Government Reference (April 2016)
Total gross notional: 15.95 Bn euros



Notional excess

$$\Delta = \sum_{i,j} e_{ij} - \frac{(\sum_i | \sum_j e_{ij} - \sum_j e_{ji} |)}{2}$$

Notional excess

$$\Delta = \sum_{i,j} e_{ij} - \frac{(\sum_i | \sum_j e_{ij} - \sum_j e_{ji} |)}{2}$$

↓↓

Gross notional Minimum notional

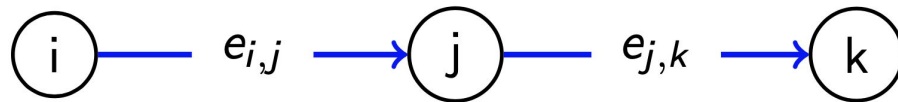
Notional excess

$$\Delta = \sum_{i,j} e_{ij} - \frac{(\sum_i |\sum_j e_{ij} - \sum_j e_{ji}|)}{2}$$

\downarrow Gross notional \downarrow Minimum notional

Theorem

*In a market of fungible and outstanding trades: There is **excess** \Leftrightarrow there is **intermediation** in the market*



Compression preferences

Conservative

Relationship constraints

Non-conservative

No constraints

Hybrid

Intra-dealer → Non-conservative

Dealer-customer → Conservative

When?
(feasibility)

How much?
(efficiency)

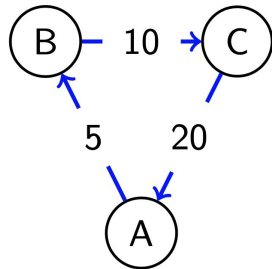
Compression preferences

When?
(feasibility)

How much?
(efficiency)

Conservative

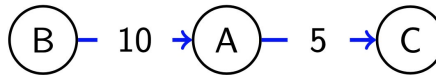
Relationship constraints



Closed chains of intermediation

Non-conservative

No constraints



Chains of intermediation

Hybrid

Intra-dealer → Non-conservative
Dealer-customer → Conservative

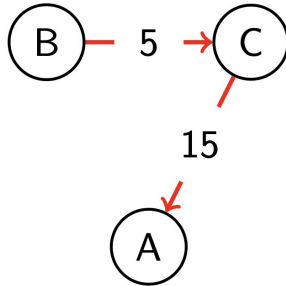
Compression preferences

When?
(feasibility)

How much?
(efficiency)

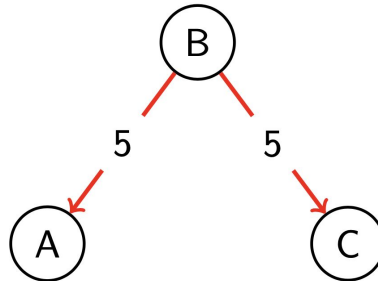
Conservative

Relationship constraints



Non-conservative

No constraints



Hybrid

Intra-dealer → Non-conservative
Dealer-customer → Conservative

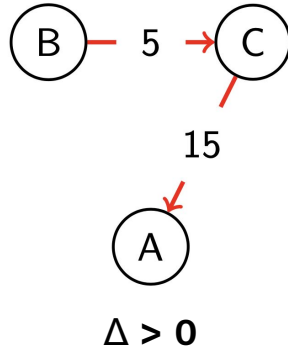
Compression preferences

When?
(feasibility)

How much?
(efficiency)

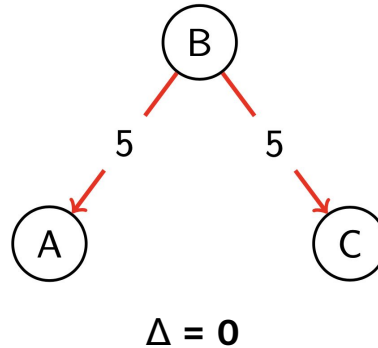
Conservative

Relationship constraints



Non-conservative

No constraints



Hybrid

Intra-dealer → Non-conservative
Dealer-customer → Conservative

Application

Approach

Data

Trade state report under EMIR: EU-wide Credit Default Swaps (single name)

- □ Oct 2014 - Apr 2016
- 100 most traded instruments (ref. entity + maturity) ≈ 70 Bn euros

Implementation

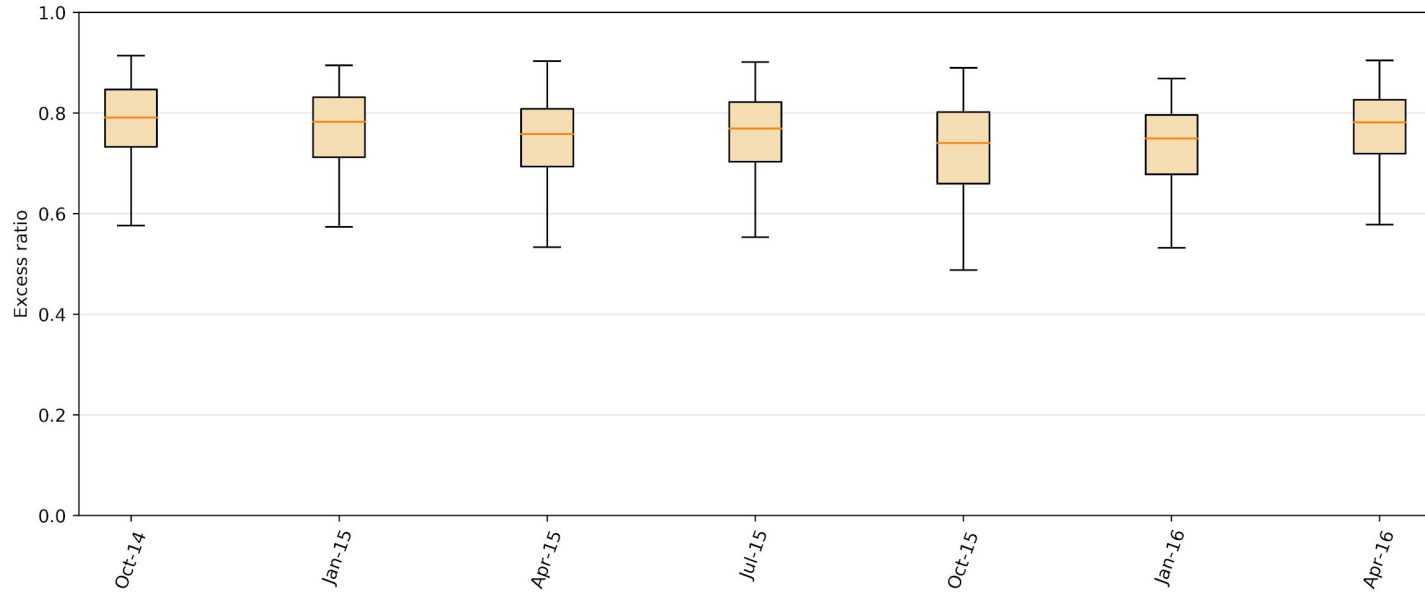
- Design optimal solution for each benchmark

Analysis

1. Excess levels
2. Efficiency of market wide adoption
3. Interaction with Central Counterparties (CCPs)

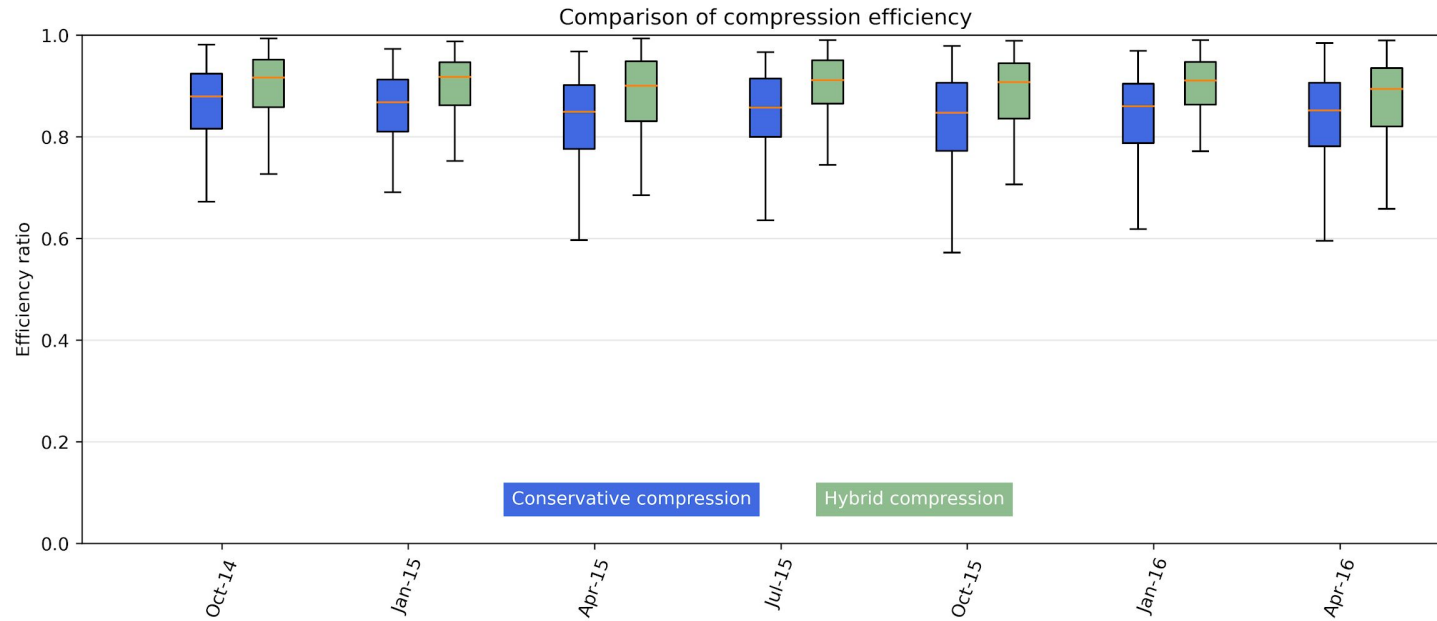
Excess

Excess



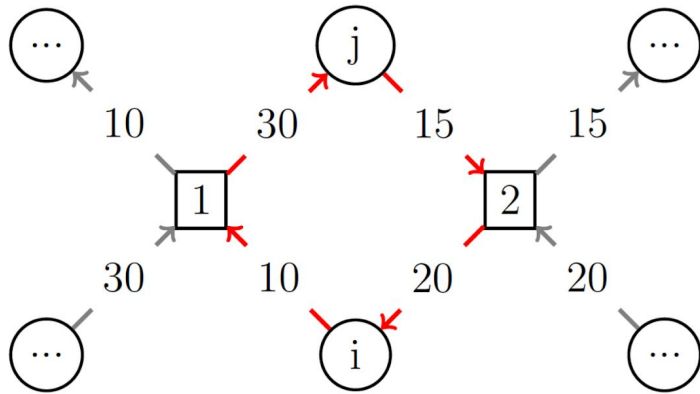
Efficiency

Efficiency

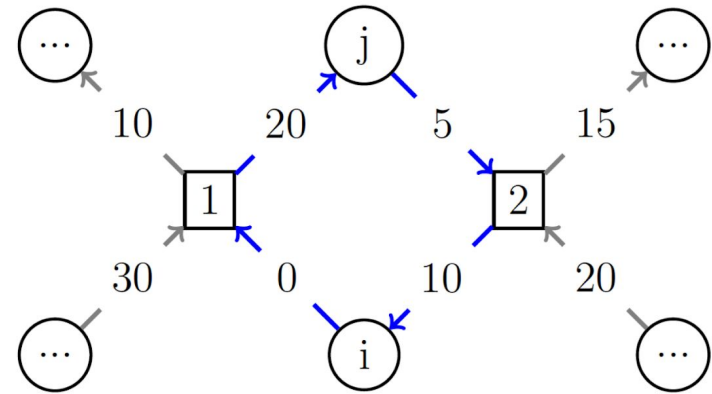


CCP and compression

CCP and compression

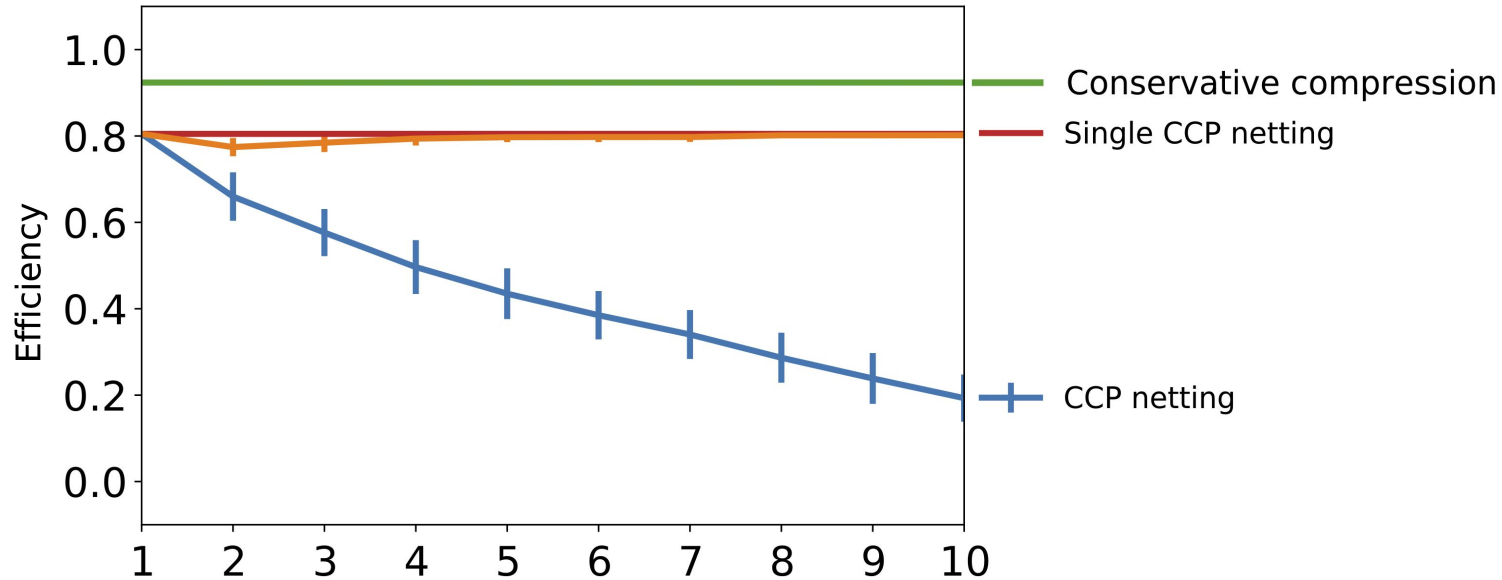


(a) Before Compression

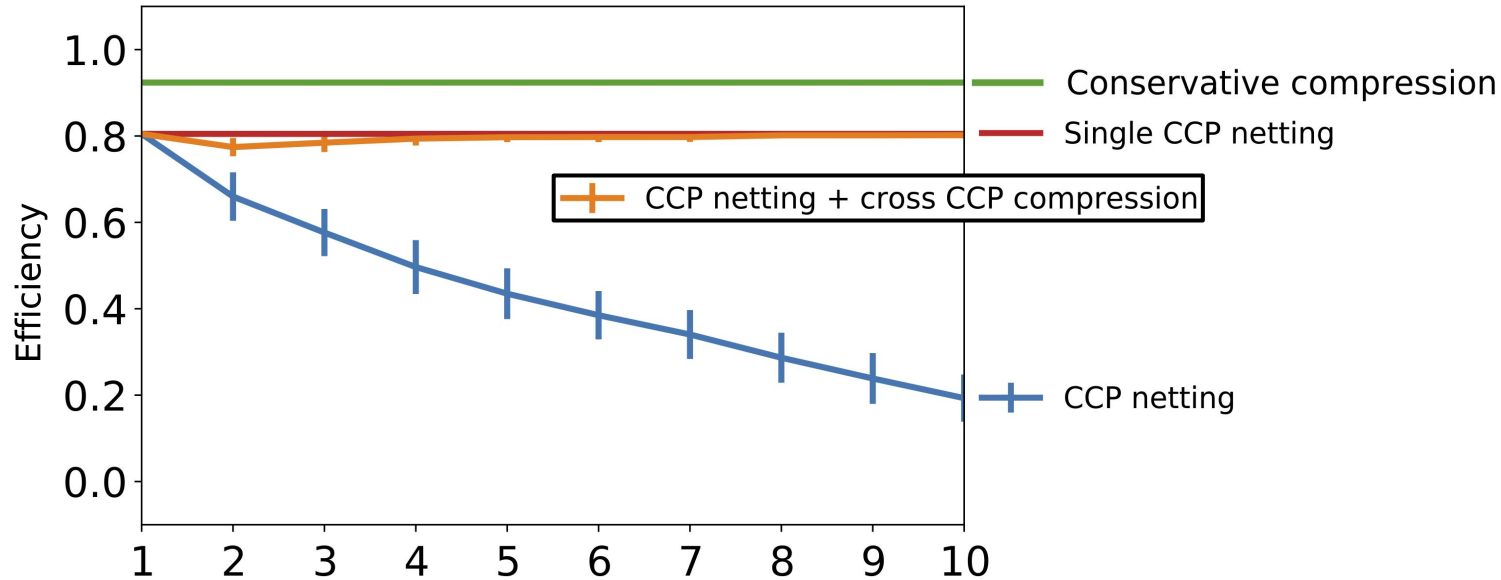


(b) After Compression

CCP and compression



CCP and compression



Conclusion

Over-the-counter markets generate large **excess** when

Fungibility

Intermediation

Conclusion

Over-the-counter markets generate large **excess** when

Fungibility

Intermediation

Excess can be removed by **compression**

- **Coordinated mechanism** leading to rapid reduction in aggregate notional
- **Private demand** driven by **regulatory cost** of excess
- This demand on its own can explain the large reduction in size in CDS

Tightly-knit structure of OTC markets
(even conservative)

Conclusion

Over-the-counter markets generate large **excess** when

Fungibility

Intermediation

Excess can be removed by **compression**

- **Coordinated mechanism** leading to rapid reduction in aggregate notional
- **Private demand** driven by **regulatory cost** of excess
- This demand on its own can explain the large reduction in size in CDS

Tightly-knit structure of OTC markets
(even conservative)

Policy implications

- Distortion of aggregate assessments
 - Liquidity, leverage, etc.
- Monitor risk redistribution effects
 - Intra-dealer vs customers
- Utility beyond the private demand
 - Systemic risk management tool

Thank you!

tarik.roukny@kuleuven.be

marco.derrico@ecb.int

Working paper available here



Compression in practice

How?

Bilateral level → Mutual agreement

Multilateral level → External service provider

TriOptima, LMRKTS, Quantile, Capitalab

How much?

TriOptima (TriReduce): \$1,855 trillion (2003-2020)

ISDA: 67% reduction of IRD markets (2010-2016)

Regulation

Defined in MiFIR / Dodd-Franck

Supported adoption under EMIR and Dodd-Franck

However...

Limited literature and analytical research on the topic

(O’Kane, 2014 QF)

Policy: Benos et al. (2013), Schrimpf (2015), Abad et al. (2016), Duffie (2017, 2018), Aldasoro and Ehlers (2018) **43**

New Working papers: Veraart (2019), Schuldenzucker and Seuken (2019), Amini and Feinstein (2020)

Why compress?

2008 Crisis aftermath (2)

New Regulatory Framework



Capital requirements Leverage ratio Collateral management



Demand for new post-trade services

(Duffie, 2017),(FSB,2017)

Why compress?

2008 Crisis aftermath (2)

New Regulatory Framework



Capital requirements Leverage ratio Collateral management



Demand for new post-trade services

(Duffie, 2017),(FSB,2017)

New role for compression

System wide multilateral deleveraging operation which does not entail asset sales or capital injection

Why compress?

2008 Crisis aftermath (1)

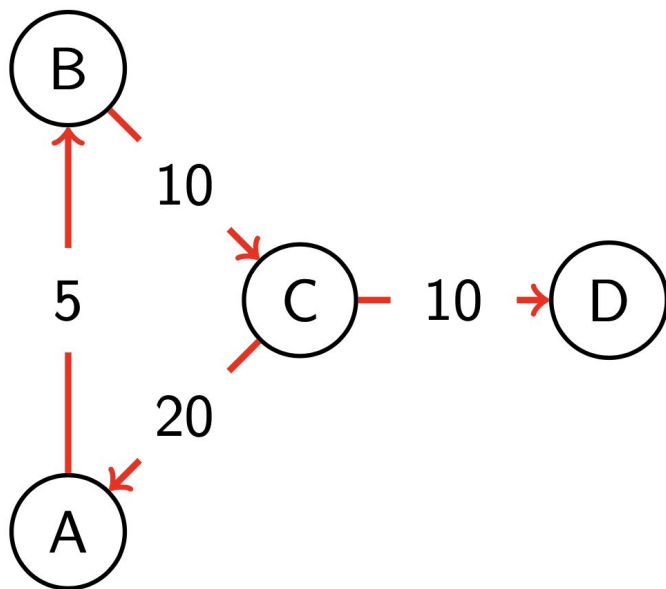


“Only now is the industry discovering the joys of compression”

The Economist, November 2008

What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



Gross

$$V_A^g = 25$$

$$V_B^g = 15$$

$$V_C^g = 40$$

$$V_D^g = 10$$

$$V^g = 45$$

Net

$$V_A^n = -15$$

$$V_B^n = +5$$

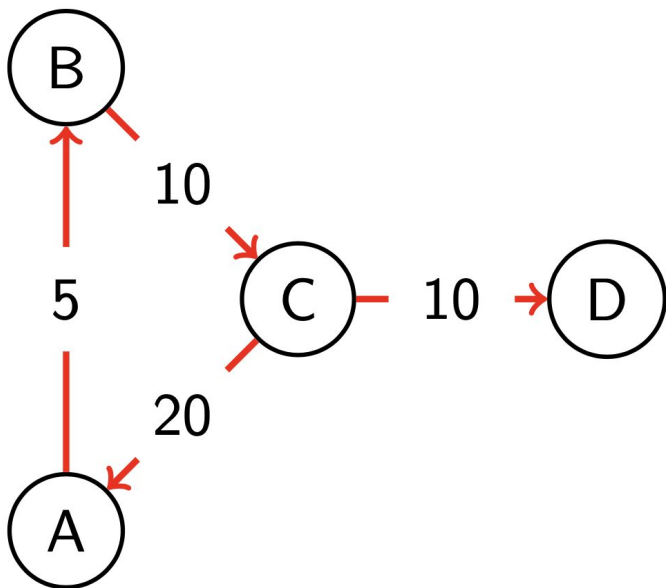
$$V_C^n = +20$$

$$V_D^n = -10$$

$$V^n = 0$$

What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



Gross

$$V_A^g = 25$$

$$V_B^g = 15$$

$$V_C^g = 40$$

$$V_D^g = 10$$

$$V^g = 45$$

Net

$$V_A^n = -15$$

$$V_B^n = +5$$

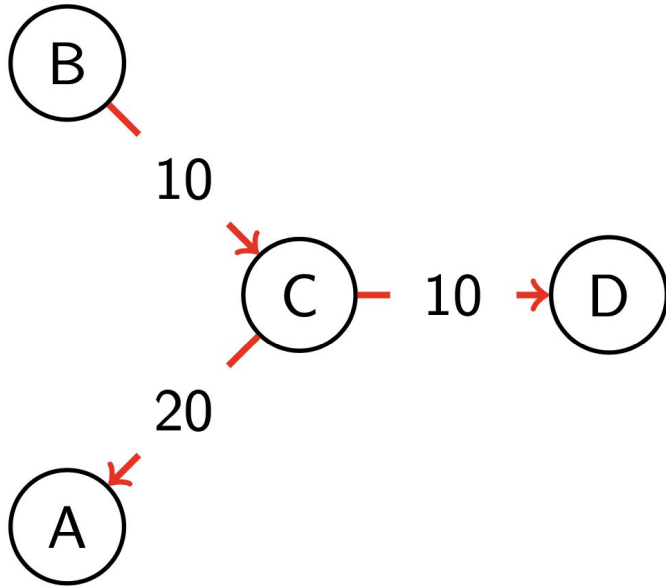
$$V_C^n = +20$$

$$V_D^n = -10$$

$$V^n = 0$$

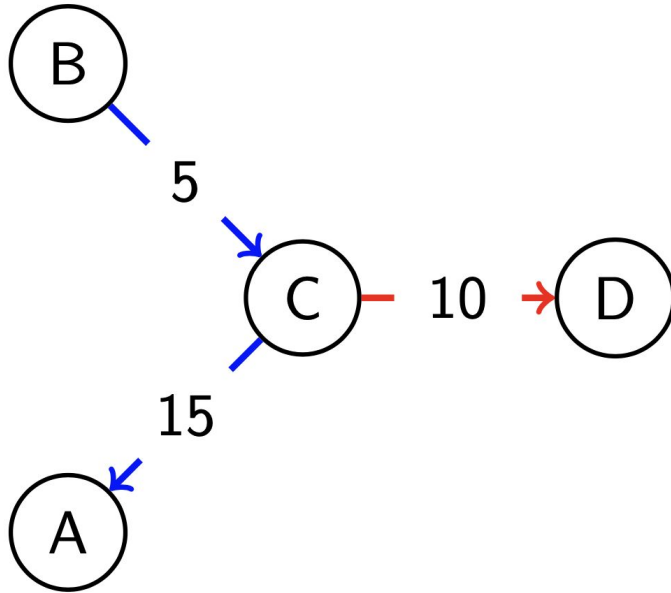
What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



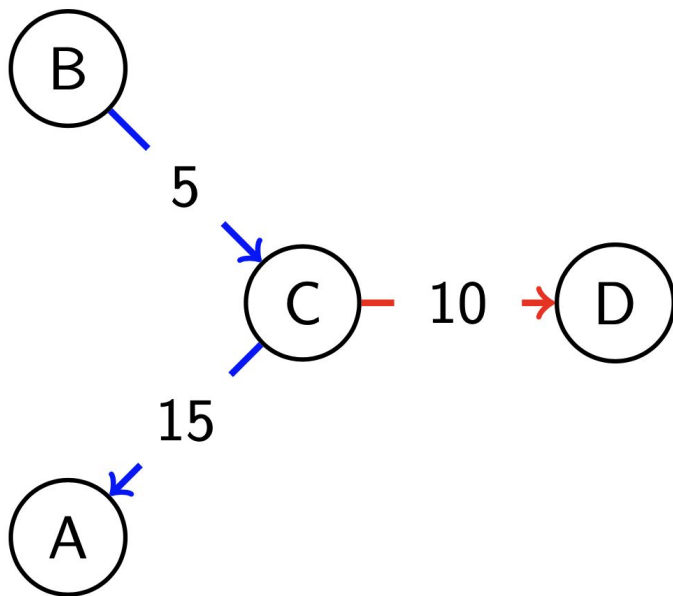
What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



Gross

$$\begin{aligned}V_A^g &= 15 \\V_B^g &= 5 \\V_C^g &= 30 \\V_D^g &= 10\end{aligned}$$

$$V^g = 30$$

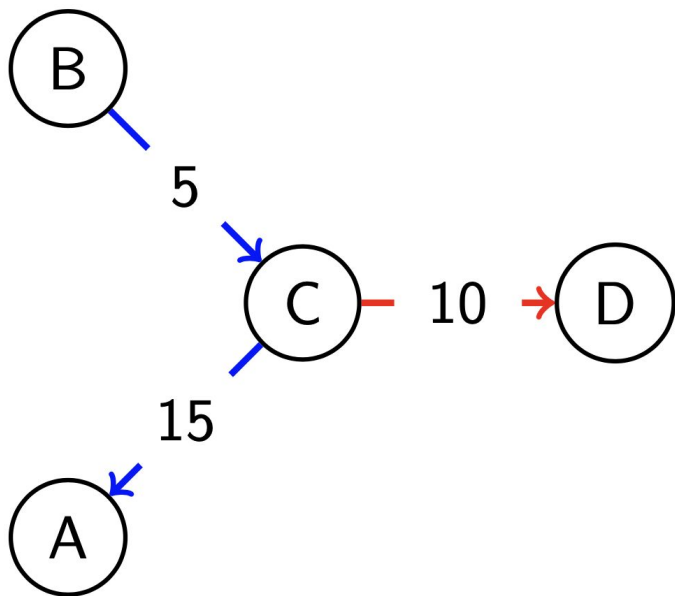
Net

$$\begin{aligned}V_A^n &= -15 \\V_B^n &= +5 \\V_C^n &= +20 \\V_D^n &= -10\end{aligned}$$

$$V^n = 0$$

What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



Gross

$$\begin{aligned}V_A^g &= 15 \\V_B^g &= 5 \\V_C^g &= 30 \\V_D^g &= 10\end{aligned}$$

$$V^g = 30$$

Net

$$\begin{aligned}V_A^n &= -15 \\V_B^n &= +5 \\V_C^n &= +20 \\V_D^n &= -10\end{aligned}$$

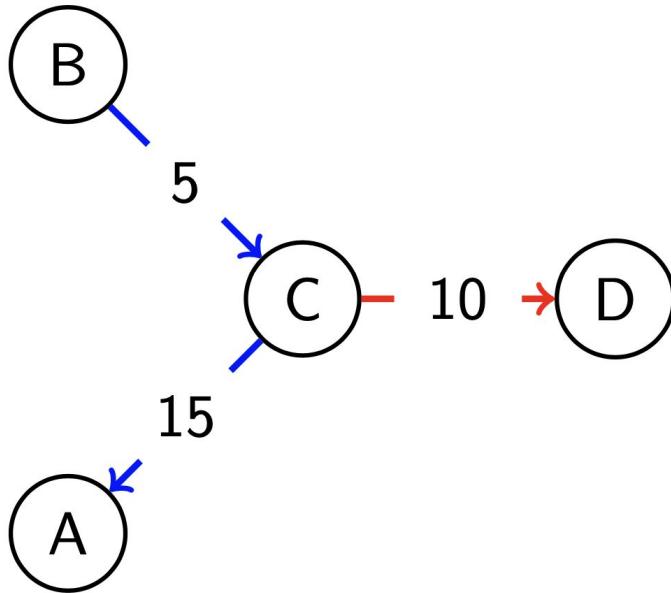
$$V^n = 0$$



Reduction in aggregate gross notional: 15

What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



Gross

$$\begin{aligned}V_A^g &= 15 \\V_B^g &= 5 \\V_C^g &= 30 \\V_D^g &= 10\end{aligned}$$

$$V^g = 30$$

Net

$$\begin{aligned}V_A^n &= -15 \\V_B^n &= +5 \\V_C^n &= +20 \\V_D^n &= -10\end{aligned}$$

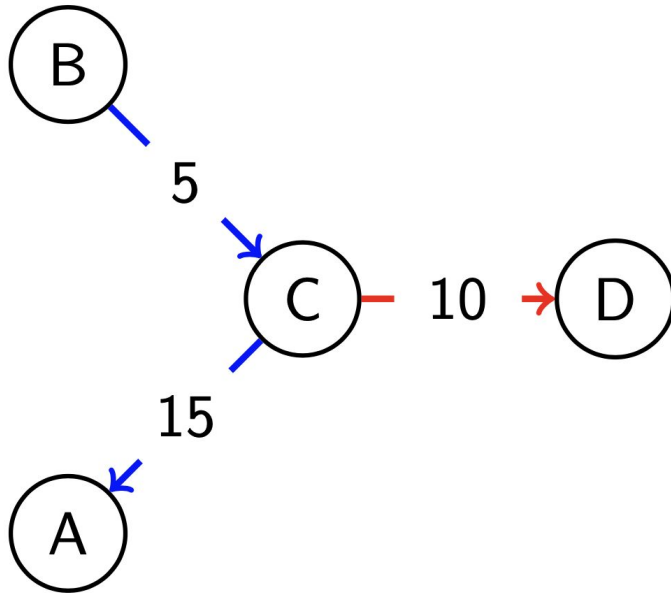
$$V^n = 0$$

Remark 1

Over-the-counter markets exhibit some redundancy in notional

What is portfolio compression?

Post-trade technology that reduces gross positions while maintaining net balances



<u>Gross</u>	<u>Net</u>
$V_A^g = 15$	$V_A^n = -15$
$V_B^g = 5$	$V_B^n = +5$
$V_C^g = 30$	$V_C^n = +20$
$V_D^g = 10$	$V_D^n = -10$
$V^g = 30$	$V^n = 0$

Remark 2

Compression is a multilateral novation netting technique that does not require a Clearinghouse or Central Counterparty