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Central Bank of Ireland

Eurosystem



# Clearinghouse-Five

Determinants of voluntary clearing in European derivatives markets

Central Bank of Ireland

15th May 2018

Paweł Fiedor

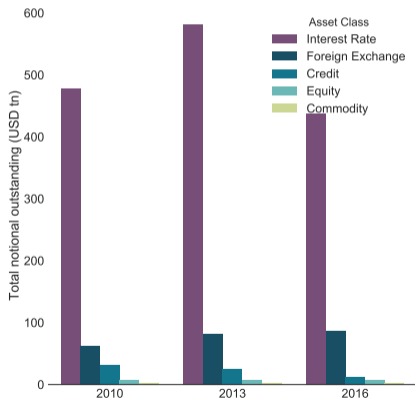
# Motivation

Why do I look at derivatives and clearing?





# Why do I look at central clearing?



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# Why do I look at central clearing?

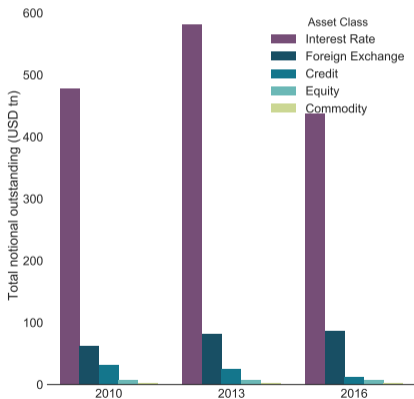
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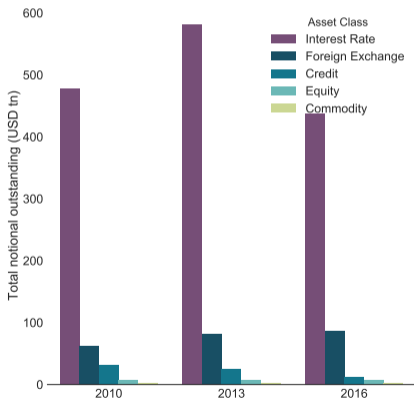


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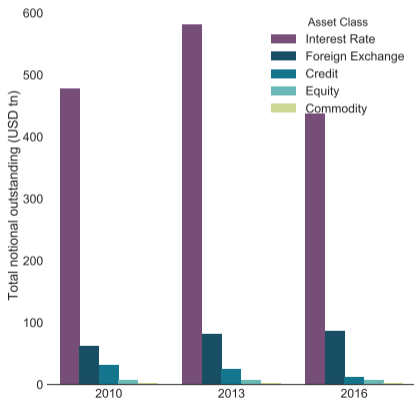


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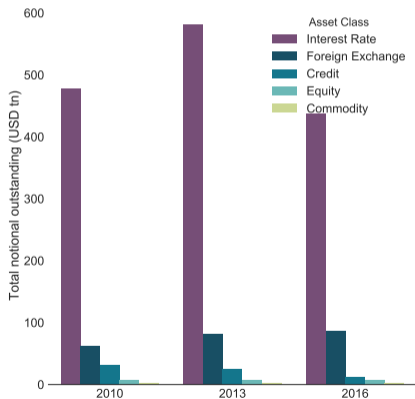


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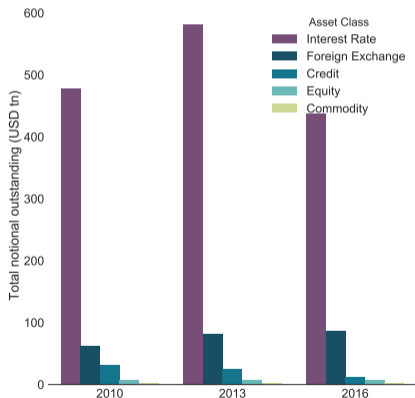
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*"In my view, derivatives are financial weapons of mass destruction."*  
Warren Buffet, 2002

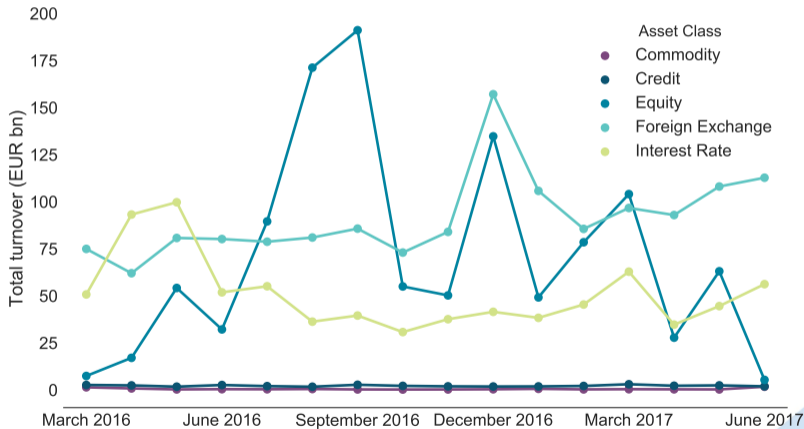
# Central clearing in the European Union

## Summary statistics



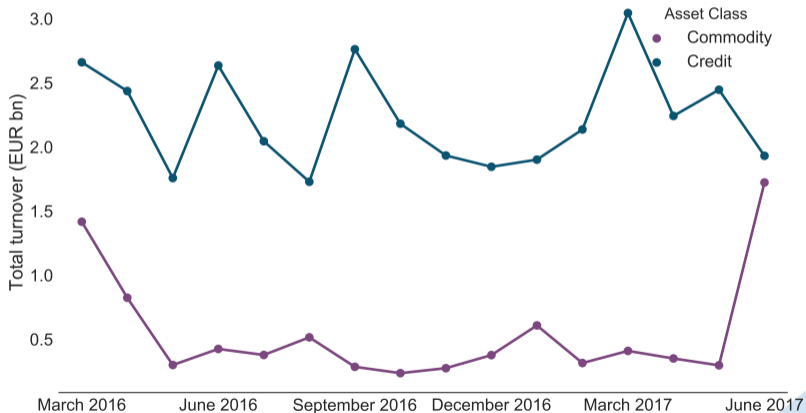
# Total monthly gross notional

*Lower bound estimate.*

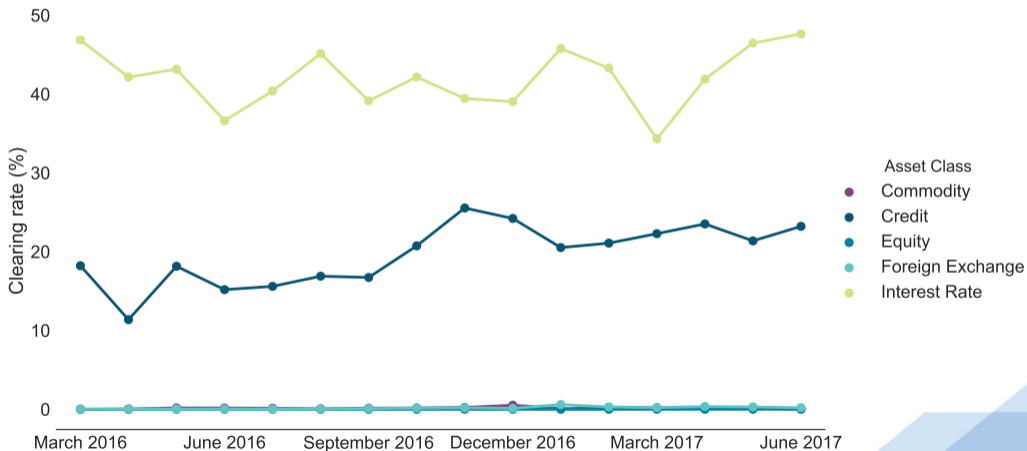


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# Monthly clearing rates

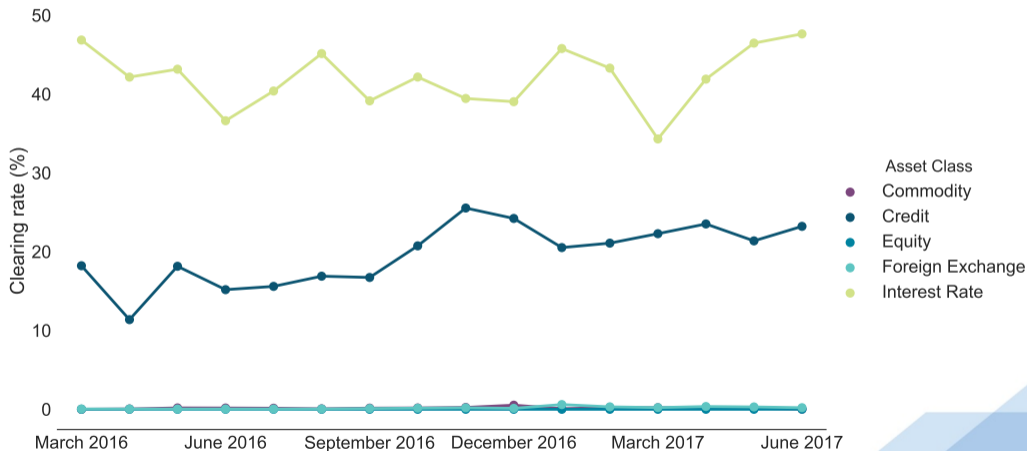


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# Monthly clearing rates

*Not all of those are cleared mandatorily!*



# Research question

What are the determinants of voluntary clearing?



# Hypotheses

I test various potential determinants (CCR + cost optimisation):





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- **H4:** non-EEA involvement (La Porta et al. 1997 JF, France & Kahn 2016 JFI);
- **H5:** financial sophistication (Stephens & Thompson 2017 JFI, BIS 2014);
- **H6:** effects of scale (Duffie & Zhu 2011 RAPS, Duffie et al. 2015 JFE, Ghamani & Glasserman 2017 JFI).



# Literature review

## Bellia *et al.* 2017 ESRB WP



# Literature review

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Study of Italian, German, and French sovereign CDS:





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- Results:



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### ■ Results:

- ▶ Large difference between clearing members and other entities;



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### ■ Results:

- ▶ Large difference between clearing members and other entities;
- ▶ Diverse factors play role in the three reference entities;
- ▶ Net position towards a CCP and CCR matter.





# Dataset

## Overview and variables used



# Dataset

**All new not obligatory cleared derivative contracts in the EU  
between March 2016 and June 2017:**



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- reported to one Trade Repository;



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3  
terabytes  
of raw data!



# Variables

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Dependent variable:



# Variables

## Dependent variable:

- cleared.



# Variables

**Dependent variable:**

- cleared.

**Binary independent variables:**



# Variables

## Dependent variable:

- cleared.

## Binary independent variables:

- intragroup;



# Variables

## Dependent variable:

- cleared.

## Binary independent variables:

- intragroup;
- clearing obligation;



# Variables

## Dependent variable:

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- intragroup;
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## Other independent variables:



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- year of maturity;



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## Other independent variables:

- year of maturity;
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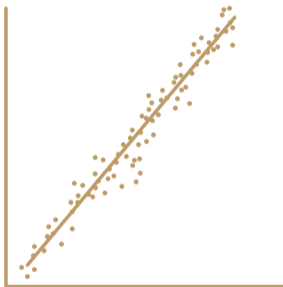
## Other independent variables:

- year of maturity;
- notional in euros;
- previous months' traded notional;
- previous months' cleared notional;
- previous months' cleared ratio.



# Results

What are the determinants of voluntary clearing?



# H1: Intragroup trades

	cleared (full sample)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
intragroup	-2.030*** (0.090)	-2.614*** (0.020)	-3.579 (2.417)	-0.940*** (0.011)	-2.382*** (0.004)
Constant	-3.225*** (0.017)	-1.132*** (0.005)	-2.678*** (0.006)	-2.733*** (0.007)	0.150*** (0.002)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Observations	4,296,374	1,814,047	12,320,166	60,627,185	4,231,413
McFadden's $R^2$	0.221	0.143	0.043	0.047	0.158



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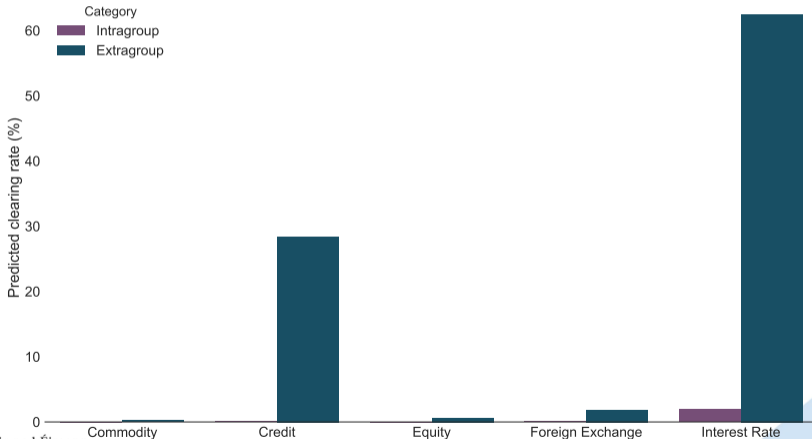
*All forthcoming hypotheses are based on a subsample without intragroup trades.*

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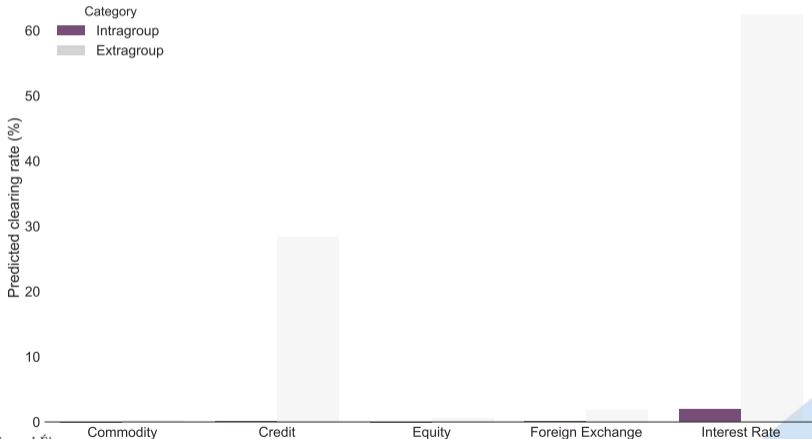
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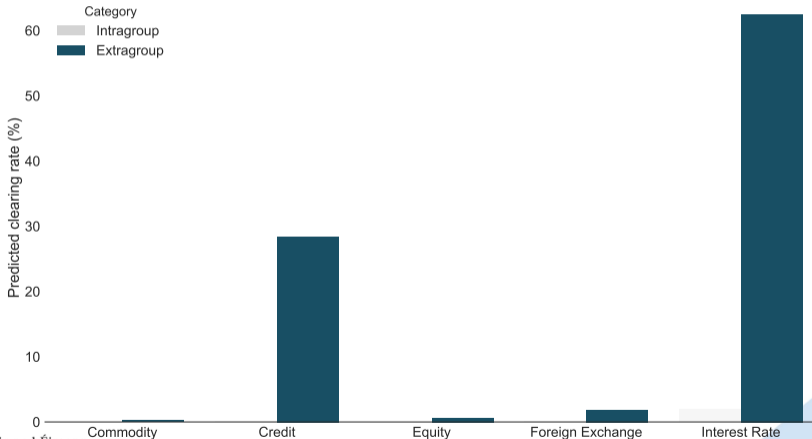
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## H2: Maturity

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
year of maturity	-0.119*** (0.004)	-0.022*** (0.000)	-0.072*** (0.000)	0.056*** (0.000)	0.017*** (0.000)
log(notional in euros)	0.099*** (0.001)	0.142*** (0.001)	-0.041*** (0.001)	0.074*** (0.000)	0.044*** (0.000)
clearing obligation	-1.482*** (0.011)	-0.413*** (0.003)	-3.284*** (0.008)	1.482*** (0.039)	-0.053*** (0.001)
Constant	236.700*** (8.754)	41.744*** (0.480)	144.170*** (0.750)	-117.300*** (1.018)	-35.770*** (0.171)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.296	0.085	0.555	0.150	0.016



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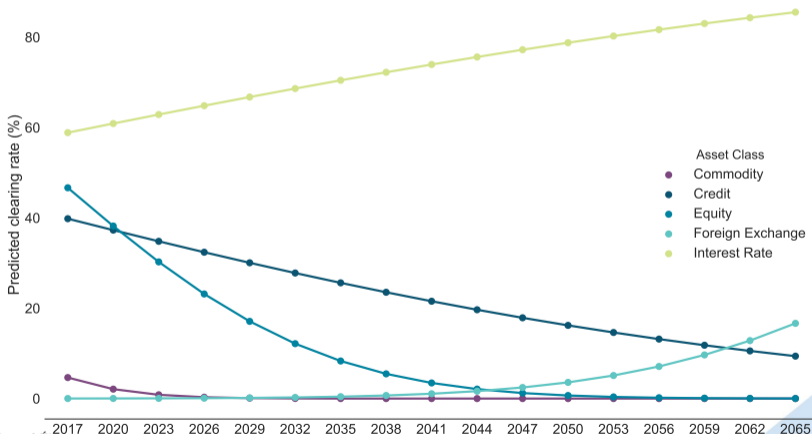
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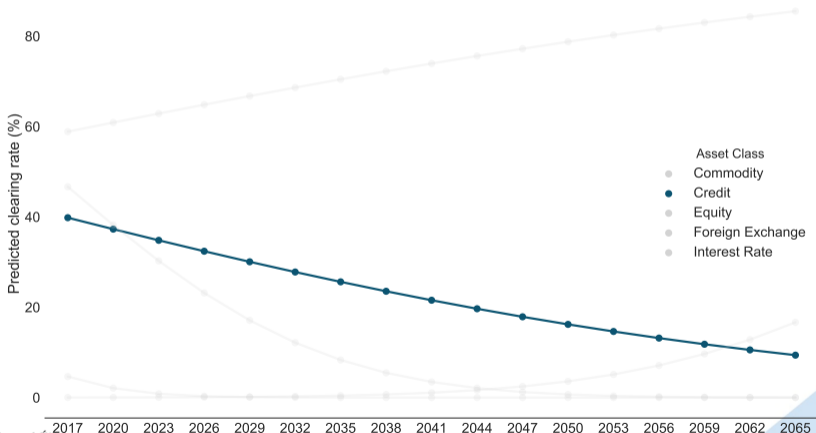
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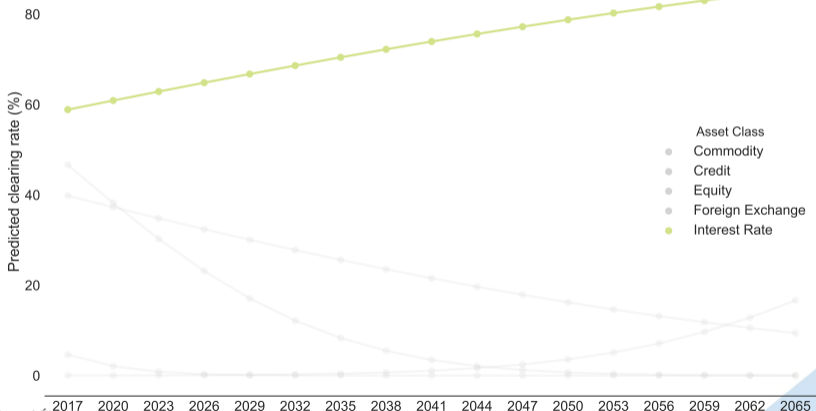
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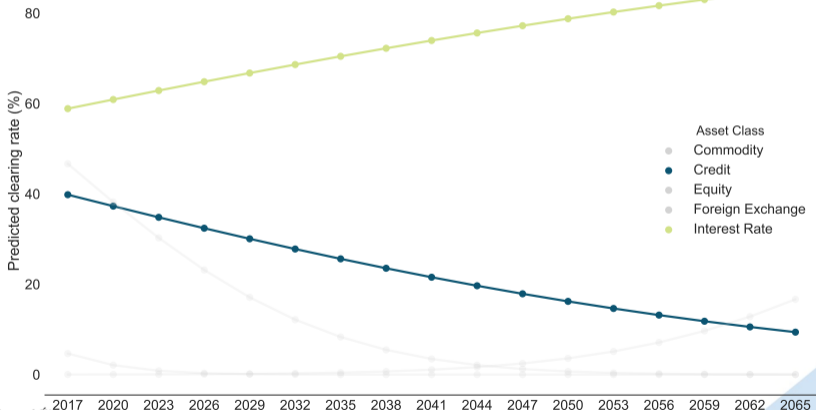
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## H3: Notional value

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
log(notional in euros)	0.109*** (0.001)	0.144*** (0.001)	-0.029*** (0.001)	0.081*** (0.000)	0.024*** (0.000)
year of maturity	-0.076*** (0.003)	-0.021*** (0.000)	-0.000* (0.000)	0.041*** (0.000)	0.015*** (0.000)
non-EEA counterparty	0.145*** (0.005)	0.132*** (0.003)	-1.594*** (0.008)	-1.398*** (0.006)	-1.216*** (0.001)
Constant	149.500*** (6.592)	38.180*** (0.475)	-1.295*** (0.386)	-85.870*** (0.261)	-29.740*** (0.182)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.251	0.075	0.201	0.255	0.163





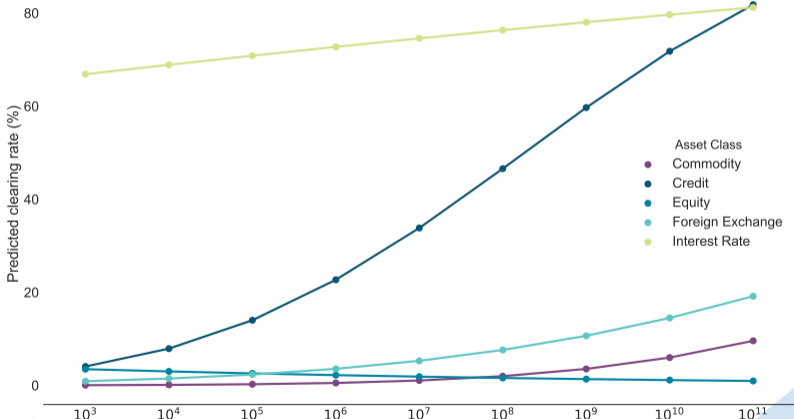
## H3: Notional value

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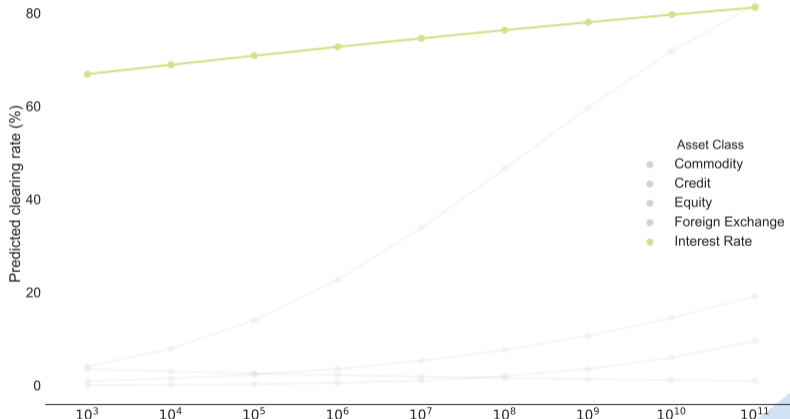
# H3: Notional value

*Assuming extragroup, intra-EEA trades at the end of the studied period with median (short-term) maturity within an asset class.*



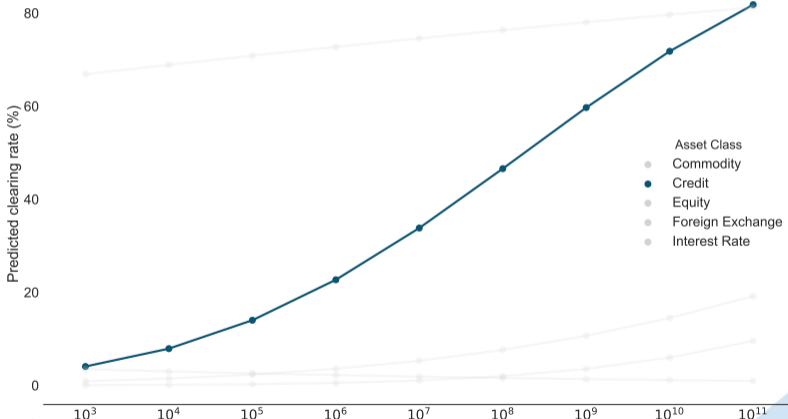
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*Assuming extragroup, intra-EEA trades at the end of the studied period with median (short-term) maturity within an asset class.*



## H4: Non-EEA involvement

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
non-EEA counterparty	0.196*** (0.005)	0.100*** (0.003)	-1.589*** (0.008)	-1.306*** (0.005)	-1.228*** (0.001)
Constant	-3.298*** (0.017)	-1.190*** (0.005)	-2.295*** (0.007)	-2.446*** (0.008)	0.592*** (0.003)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.209	0.031	0.198	0.153	0.156



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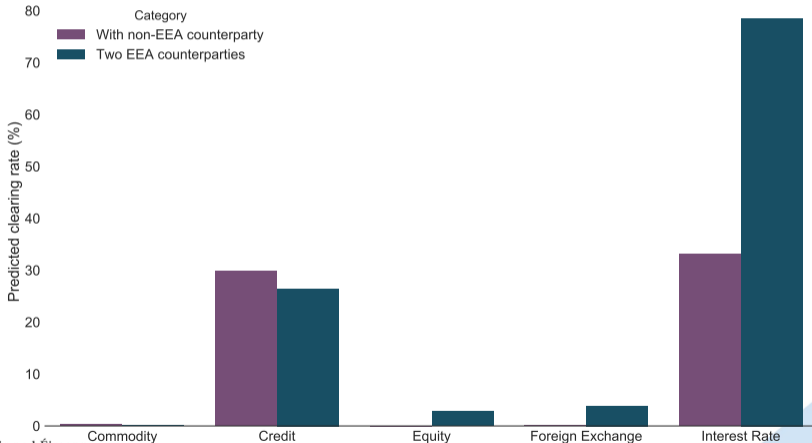
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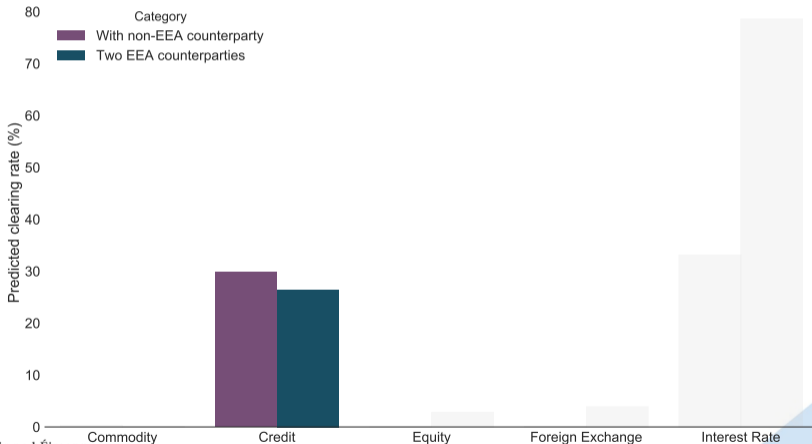
*Assuming extragroup trades at the end of the studied person.*





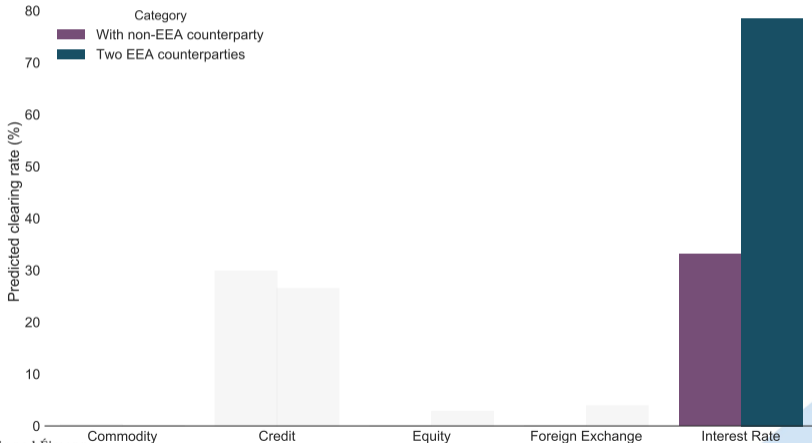
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# H4: Non-EEA involvement

*Assuming extragroup trades at the end of the studied person.*



## H5: Financial sophistication

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
financial nature	-0.900*** (0.019)	1.170*** (0.019)	-0.891*** (0.009)	1.038*** (0.029)	0.798*** (0.008)
non-EEA counterparty	0.605*** (0.008)	0.113*** (0.003)	-1.977*** (0.009)	-1.411*** (0.006)	-1.266*** (0.002)
Constant	-4.479*** (0.034)	-2.967*** (0.022)	-0.014 (0.013)	-3.603*** (0.030)	-0.429*** (0.009)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.515	0.041	0.544	0.201	0.171



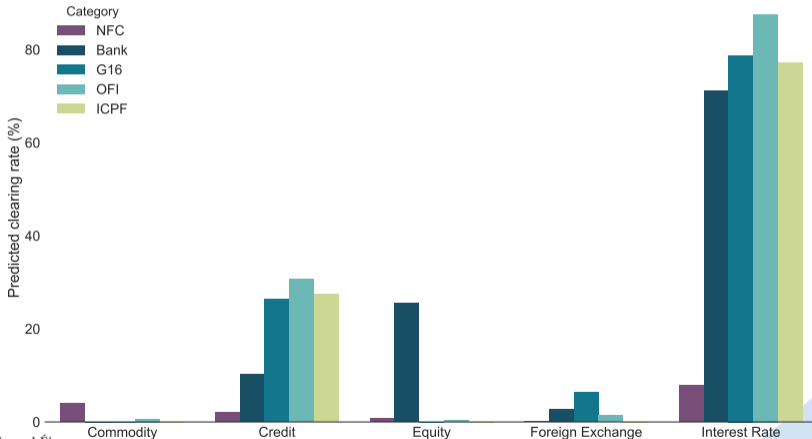
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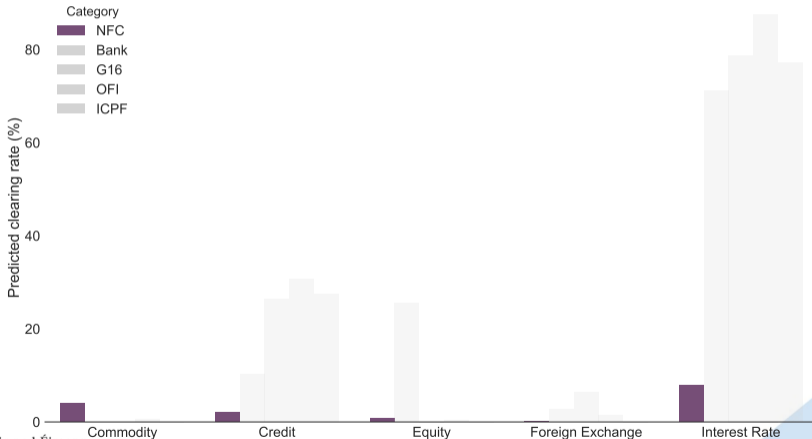
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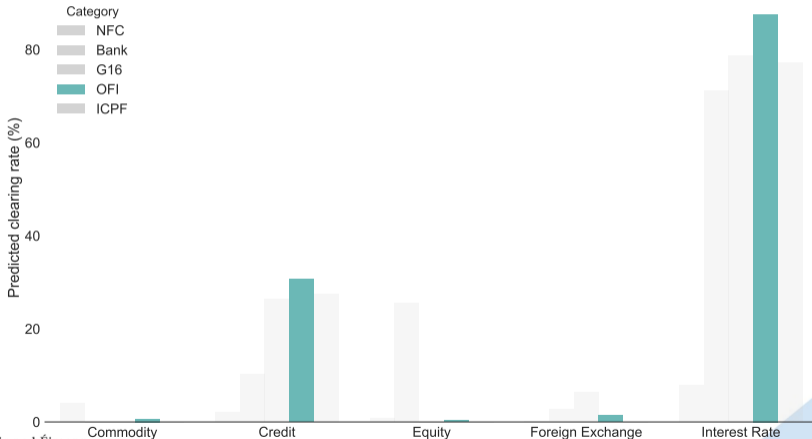
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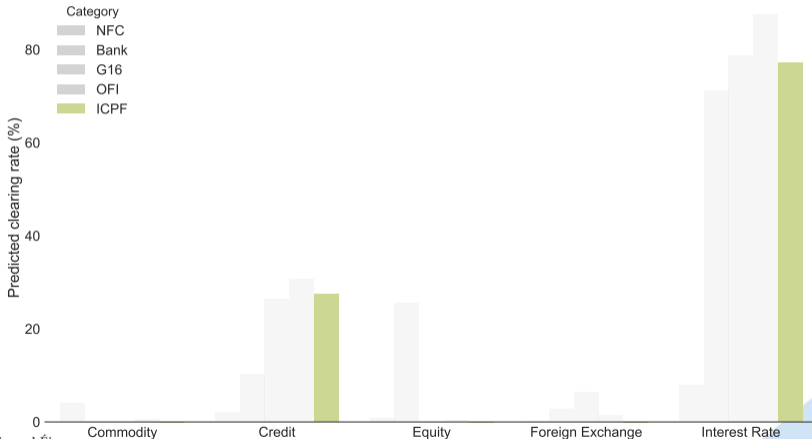
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## H6: Effects of scale

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
prev. cleared ratio	7.203*** (0.048)	2.798*** (0.008)	6.810*** (0.050)		1.868*** (0.003)
Constant	-4.265*** (0.044)	-2.198*** (0.011)	-4.128*** (0.069)		-0.615*** (0.003)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.866	0.154	0.991		0.050



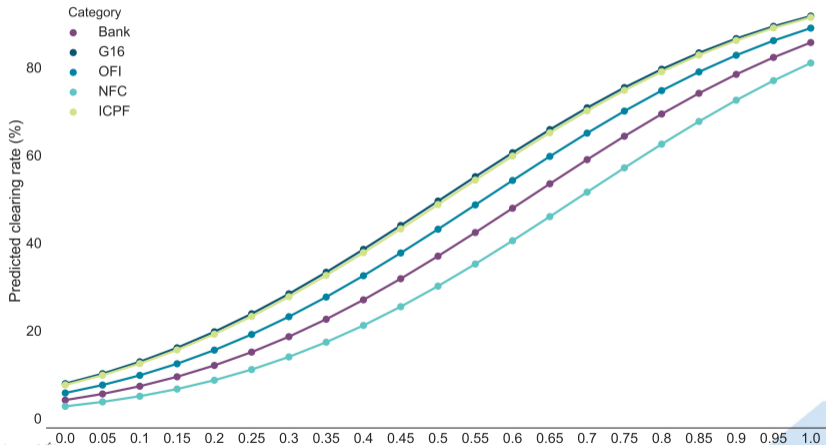
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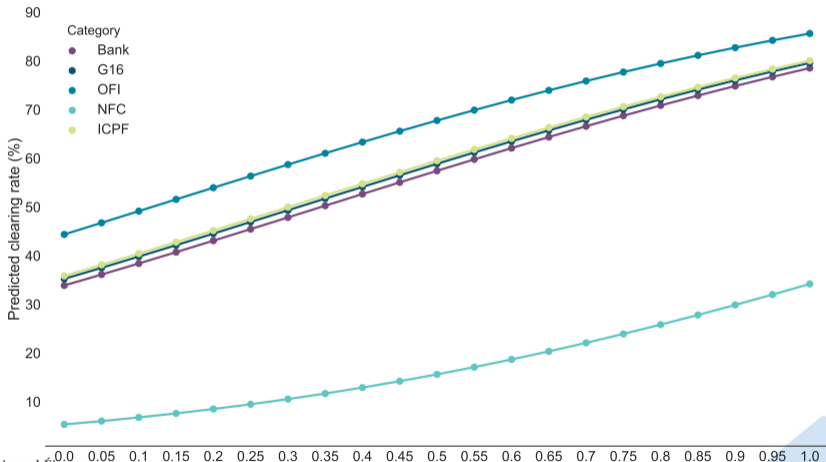
# H6: Effects of scale (Credit)

*Assuming extragroup trades at the end of the studied period.*



# H6: Effects of scale (Interest Rate)

*Assuming extragroup trades at the end of the studied period.*



# Conclusions

## What have we learned?



# Main findings

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- Differences across asset classes:



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  - ▶ Only Credit & Interest Rate are centrally cleared to a significant degree!
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# Main findings

- **Differences across asset classes:**
  - ▶ Only Credit & Interest Rate are centrally cleared to a significant degree!
  - ▶ Some factors affect Credit & Interest Rate contracts differently.
- **Effects of scale:**
  
- **Other factors:**



# Main findings

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- ▶ Some factors affect Credit & Interest Rate contracts differently.

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- ▶ There are significant effects of scale connected with central clearing, both in terms of:

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Details in the full paper ([ESRB WP 72](#)).





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# Policy implications

The results are timely in relation to the ongoing policy debate:

- It seems there is a scope for extending the clearing obligation given there is a significant amount of voluntary clearing in the markets;
- Strong effects of scale imply that future regulation may wish to take this into account in helping overcome the fixed costs;
- In particular, three remaining asset classes may need regulatory push to kick start central clearing.



Thank you!  
pawel.fiedor@centralbank.ie



# Background slides

## Summary statistics



## H6a: Effects of scale (trading)

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
log(prev. months' notional)	-0.088*** (0.001)	0.041*** (0.001)	-0.123*** (0.001)	0.395*** (0.002)	0.047*** (0.000)
Constant	-5.098*** (0.030)	-2.731*** (0.018)	0.609*** (0.014)	-4.985*** (0.017)	-1.046*** (0.007)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.544	0.039	0.444	0.248	0.023



## H6a: Effects of scale (trading)

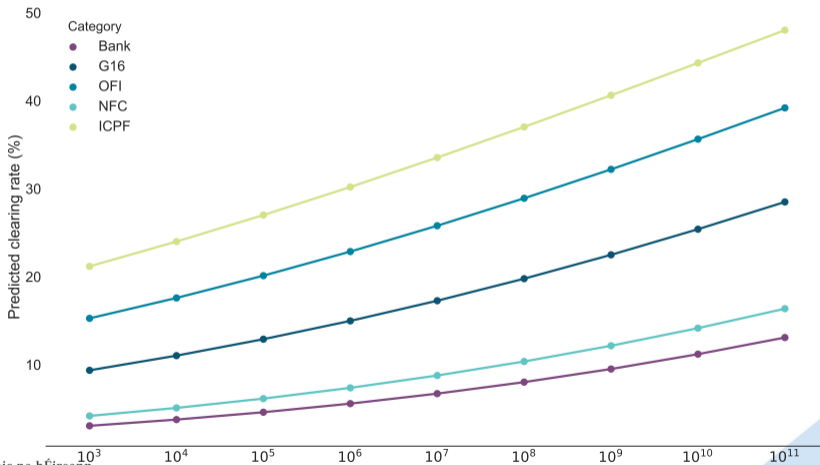
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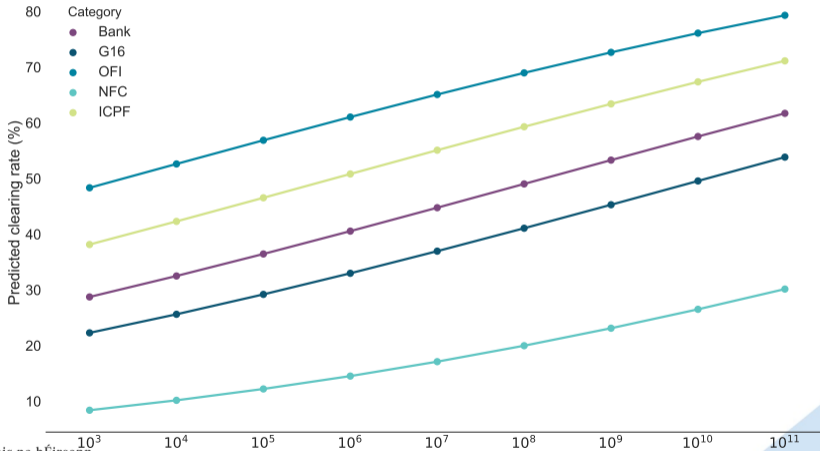
# H6a: Effects of scale (trading, Credit)

*Assuming extragroup trades at the end of the studied period.*



# H6a: Effects of scale (trading, Interest Rate)

*Assuming extragroup trades at the end of the studied period.*



## H6b: Effects of scale (clearing)

	cleared (extragroup)				
	(CO)	(CR)	(EQ)	(FX)	(IR)
log(prev. months' not. cleared)	0.289*** (0.002)	0.110*** (0.000)	0.396*** (0.003)	0.071*** (0.000)	0.072*** (0.000)
Constant	-3.946*** (0.035)	-3.907*** (0.015)	-4.652*** (0.076)	-3.935*** (0.011)	-1.593*** (0.006)
Monthly FE	Yes	Yes	Yes	Yes	Yes
Type FE	Yes	Yes	Yes	Yes	Yes
Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
McFadden's $R^2$	0.885	0.119	0.990	0.177	0.049



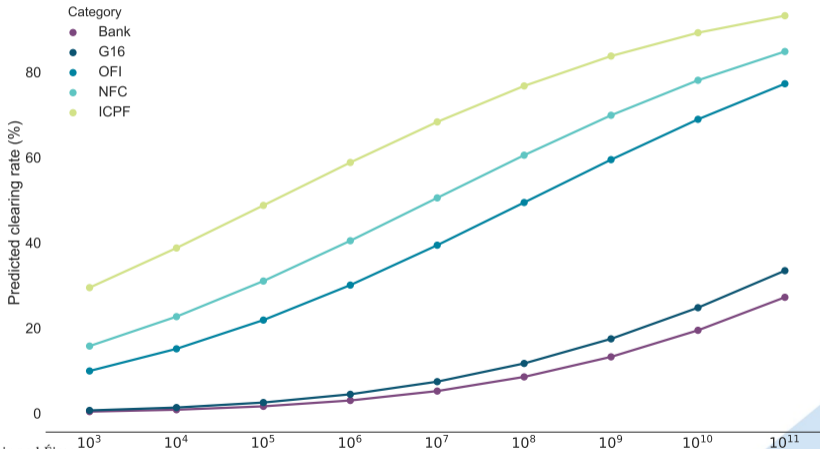
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Monthly FE	Yes	Yes	Yes	Yes	Yes
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Observations	3,770,361	†	9,470,268	53,982,802	3,546,324
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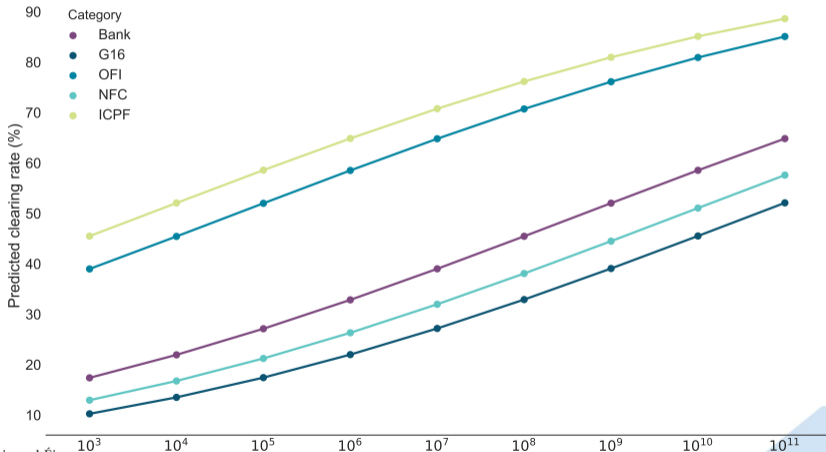
# H6b: Effects of scale (clearing, Credit)

*Assuming extragroup trades at the end of the studied period.*



# H6b: Effects of scale (clearing, Interest Rate)

*Assuming extragroup trades at the end of the studied period.*



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