Nordea MARKETS

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ECB tiering and money market rates

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Executive summary

- **Signalling lower for longer**
  - When policy rates reach their lower zero bound, market participants expect interest rates only to rise
  - The ECB changed the probability distribution of rates by negative interest rate policy (NIRP) in 2014
  - A tiered central bank deposit system could mitigate the adverse effects of the NIRP, opening the door for new rate cuts
  - Low/negative rates for longer (the ECB would hardly create a new deposit system just for a few months)

- **A possible tiered deposit system – consequences and challenges**
  - Minimum reserve requirement MRR (1% of the banks' certain liabilities, a total of EUR 128bn) @ the Main Refinancing Operations (MRO), currently 0%
  - NEW: X * MMR **exempted** from deposits @ negative rates, i.e. deposits @ MRO or zero
  - The rest of the excess reserves @ the Deposit Facility Rate, currently -0.40%
  - ➢ Banks with low or no excess reserves would seek short-term funds at negative rates to deposit them with the central bank at a higher rate
  - The Euro-zone banking system/sovereign bond market more complex and fragmented than in Japan, Switzerland and Denmark (countries with NIRP, tiering)
  - ➢ Hence, a significant amount of funds may not flow from "excess reserve banks" to the banks seeking them, particularly not in cross-border transactions

- **Repo rates, short-dated government bond yields**
  - ➢ Even a modest multiplier of five could drain most of the excess liquidity in several non-core countries …
  - ➢ … possibly leading to higher repo rates and cheapening of short-dated non-core government bonds

- **EONIA**
  - Empirical evidence: even a drain of EUR 1000bn in the excess liquidity should not lift EONIA
  - However, EONIA's turnover has been low recently, so even small unsecured O/N transactions at higher rates could drive fixings upwards
  - Recall that EONIA becomes a tracker of €STR (+spread) in October

- **€STR**
  - Measures O/N wholesale funding costs of 50 banks under the ECB Money Market Statistical Reporting (MMSR)
  - Trimming: 25% of the highest and lowest volume-weighted transaction rates excluded from the final calculations …
  - … which is set to minimise market impacts arising from a possible tiering system and resulting O/N funding transactions at high rates
  - Tiering could prove useful in the €STR era, as it would provide a new tool to manage liquidity …
  - … because when the ECB hikes rates, banks' deposit/borrowing rates may not follow higher, if ample liquidity persists. The DFR will not floor €STR (unlike EONIA).

Lower bound/central bank's signals -> rate expectations and longer-term rates (in 2015)

When policy interest rates reach zero, even with credible forward guidance the term structure can steepen as markets anticipate that future short-term rates can only rise.

If, however, they can be convinced that the lower bound for short-term rates is not zero but can be made negative, then the probability distribution of future rate movements changes.

After we introduced our negative deposit rate last year, we saw long-term interest rates starting to flatten.

"How binding is the zero lower bound?" Speech by Benoît Cœuré, Member of the Executive Board of the ECB, at the conference "Removing the zero lower bound on interest rates", organised by Imperial College Business School / Brevan Howard Centre for Financial Analysis, CEPR and the Swiss National Bank, London, 18 May **2015.**

ECB monetary policy meeting/press conference March 2016

Does it mean that we can go as negative as we want without any consequences for the banking system?

The answer is no.

And you probably know that we've discussed for some time the possibility of having a tiering system,
so an exemption system for this operation,
and in the end the Governing Council decided not to, exactly for the purpose of not signalling that we can go as low as we want on this.

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ECB monetary policy meeting/press conference March 2016

The final decision of not having a tiering system or an exemption system was not only based on the desire not to signal that we can go as low as we want, but also the complexity of the system is remarkable in an area like the Euro zone, with many banks of different sizes, different conditions, in totally different market situations.

So it was both the desire of not signalling, but also the inherent complexity in that.

ECB monetary policy meeting/press conference April 2019

In the context of our regular assessment, we will also consider whether the preservation of the favourable implications of negative interest rates for the economy requires the mitigation of their possible side effects, if any, on bank intermediation.

…………………

It's also a fact that the impact of negative rates changes: it's very different when they start, and then when they've been in place for a long period of time. So we also have to assess that.

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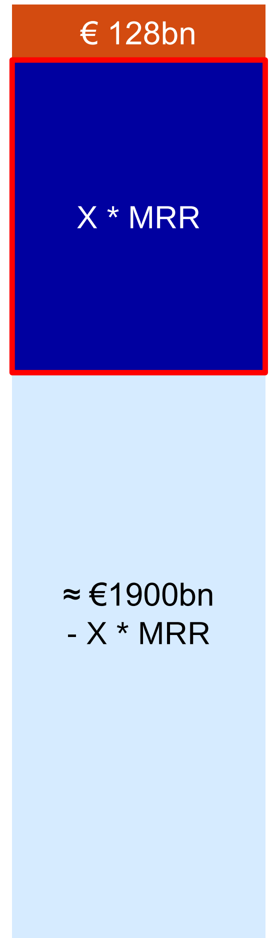
Example of tiering/exemption system
-> de facto drain of excess liquidity

Current deposit system

- Minimum reserve requirement @ MRO 0%
- Excess reserves @ DFR -0.40%

Simple tiering/exemption system



- Minimum reserve requirement @ MRO 0%
- X * Minimum reserve requirement exempted from deposits at negative rate
- Excess reserves @ DFR -0.40%

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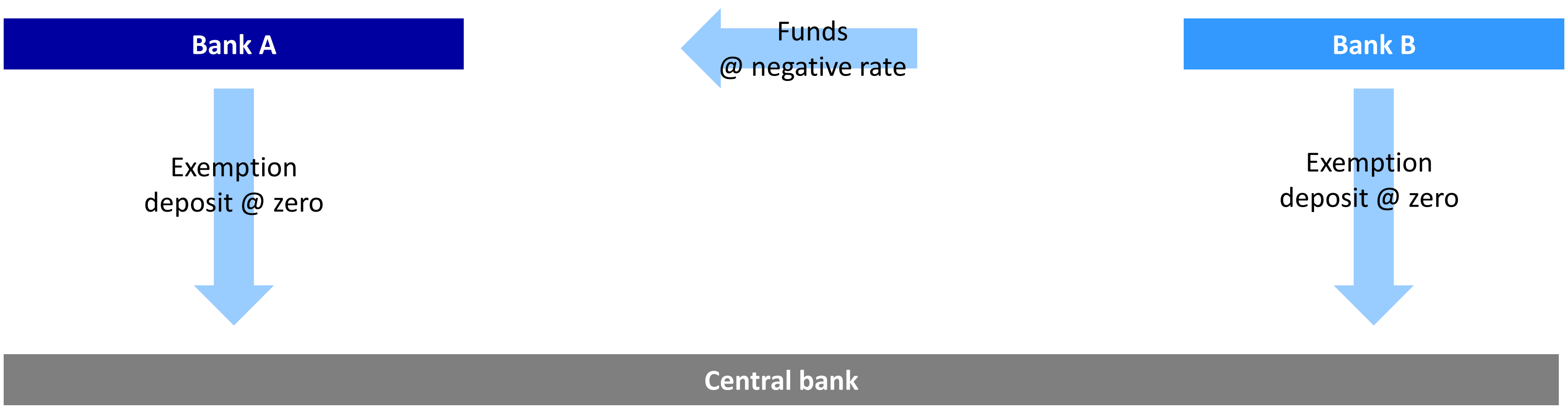
Bank treasuries in tiering/exemption system

Low excess reserves

- Seek new short-term funding at negative rates (e.g. @ -10bp) …
  - Unsecured (EONIA, €STR)
  - Secured by using bonds as collateral (repo rates)
- … and deposit with the central bank at zero …
- … to make a modest profit

Ample excess reserves

- Benefit from an exemption system
- Additionally, assess …
  - Credit quality of potential new money market bank counterparties, especially in cross-border transactions
  - Regulatory consequences
- … to lend further excess reserves to the banks seeking them
- Earnings would improve due to the avoided deposit @ DFR of -0.40%



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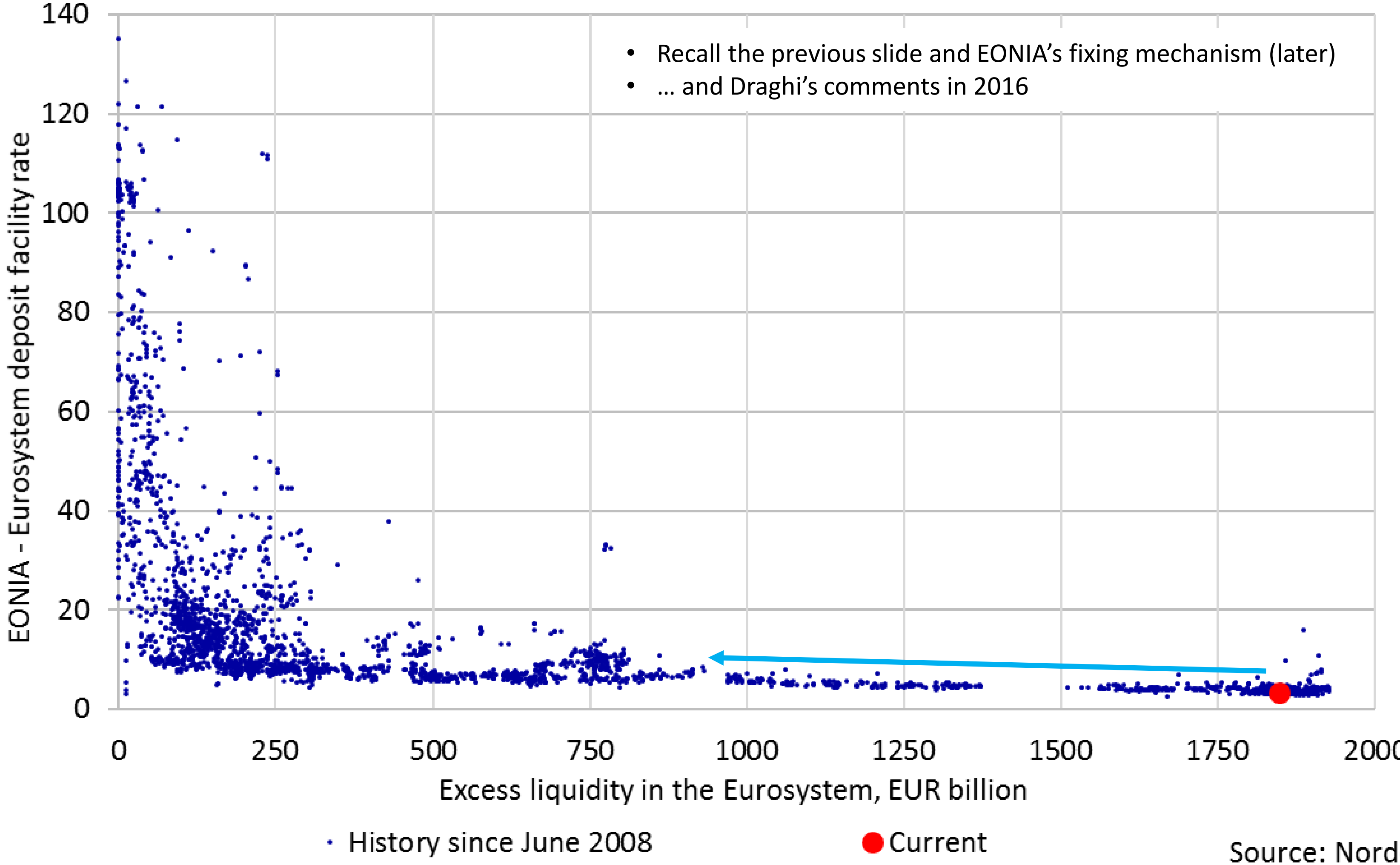
History: even a massive decline of EUR 1000bn in excess liquidity should not affect EONIA.



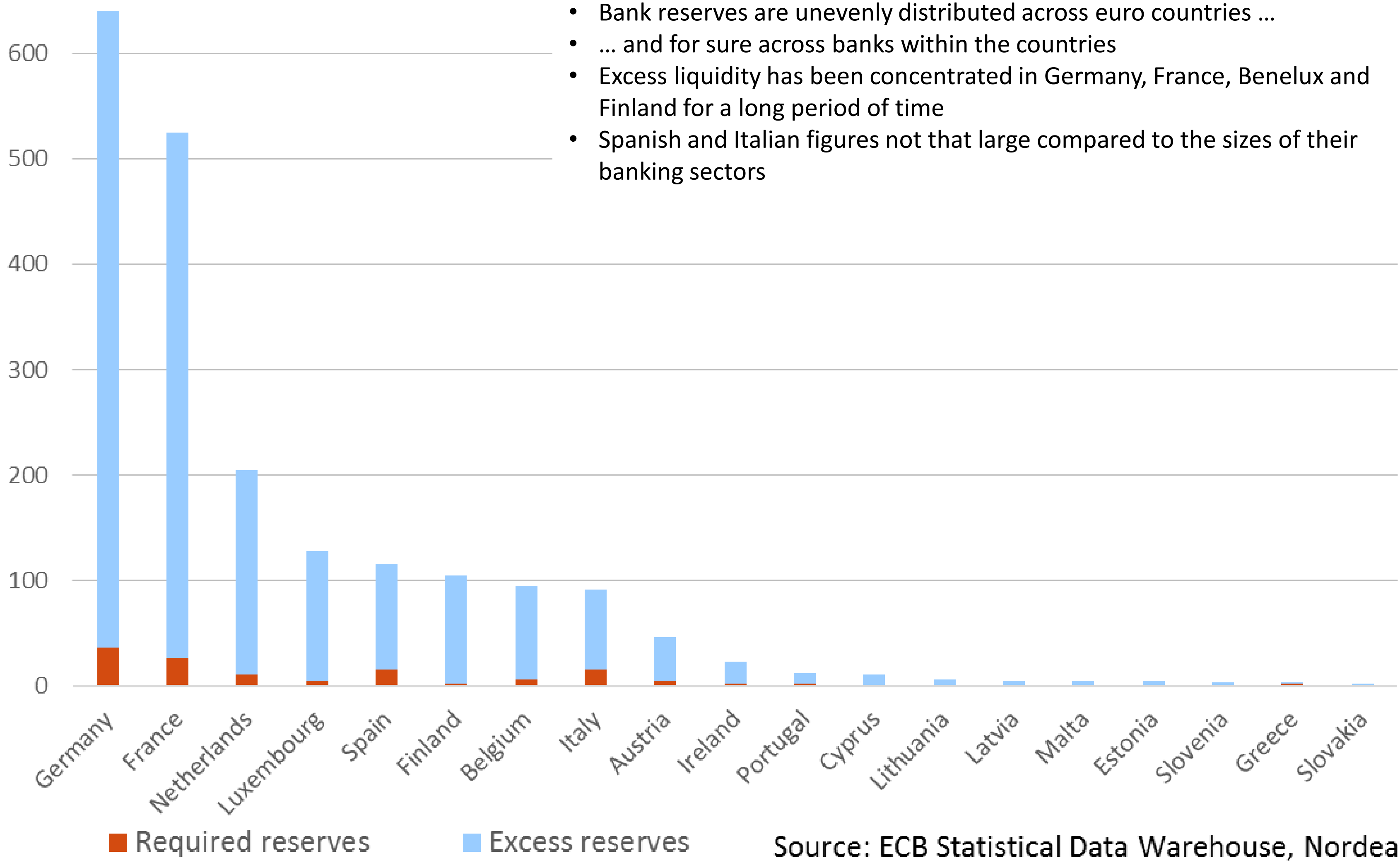
Source: Nordea

So it’s not necessarily that simple …

The complexity of the system is remarkable
in an area like the Euro zone.

The euro zone is not a single country like Japan, Switzerland and Denmark,
countries with negative interest rates and tiering.

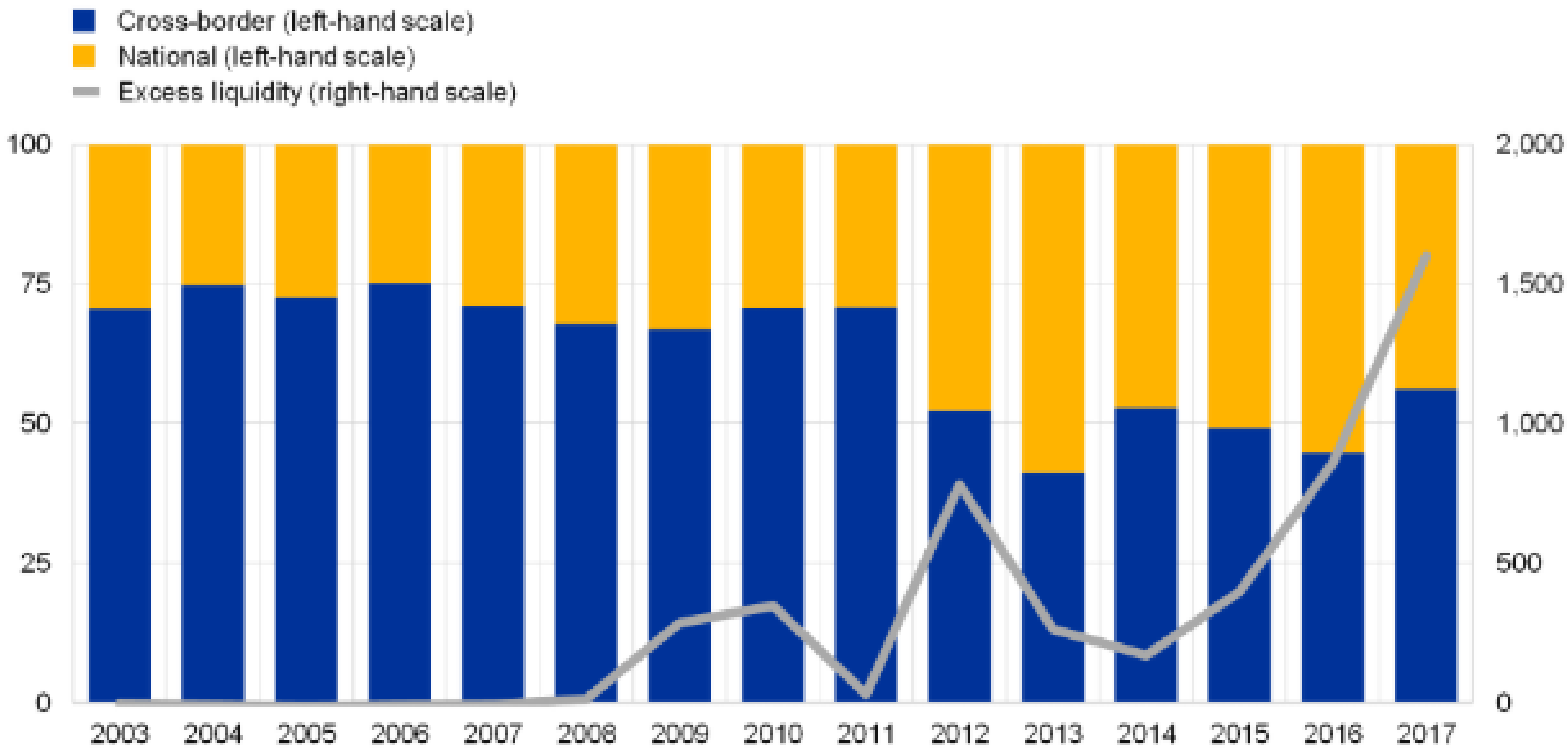
Reserves in the Euro zone: minimum reserve requirement + excess reserves, EUR billion



- Bank reserves are unevenly distributed across euro countries …
- … and for sure across banks within the countries
- Excess liquidity has been concentrated in Germany, France, Benelux and Finland for a long period of time
- Spanish and Italian figures not that large compared to the sizes of their banking sectors

Source: ECB Statistical Data Warehouse, Nordea

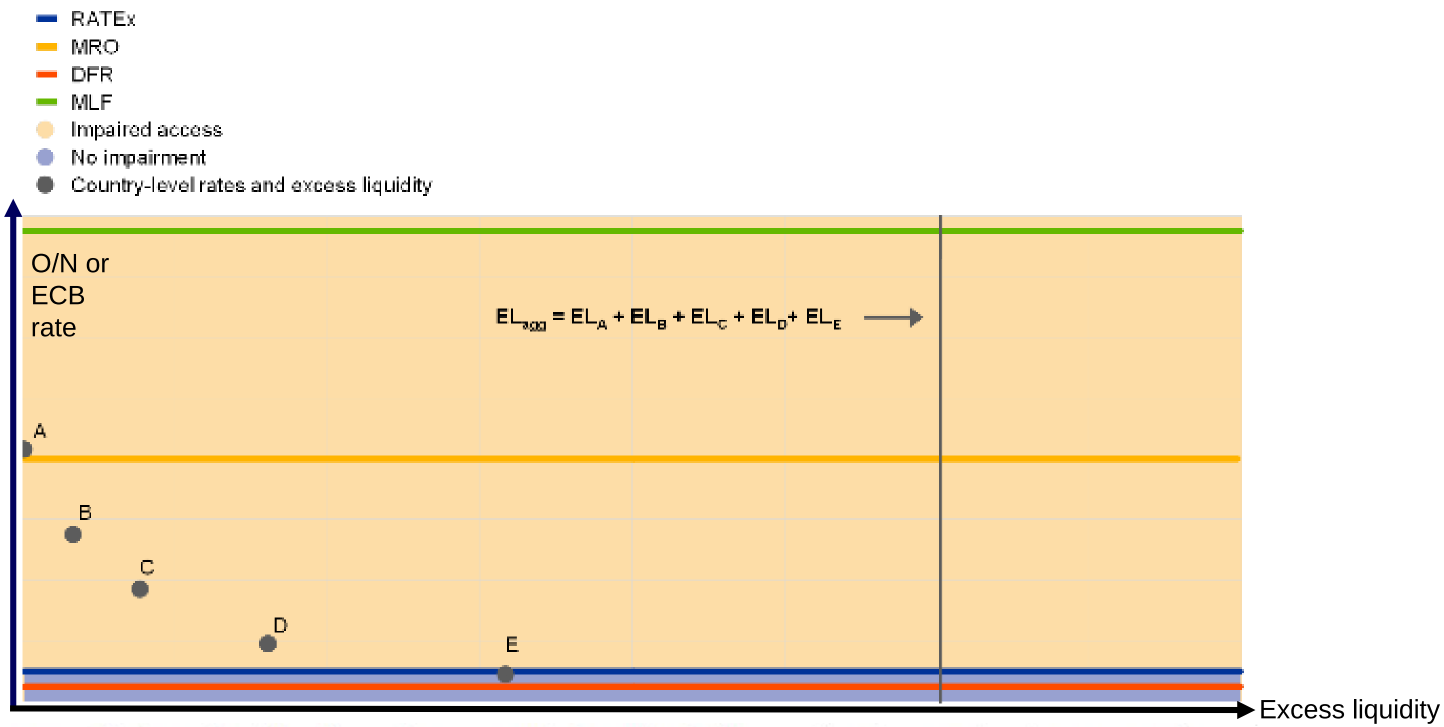
Would excess liquidity flow from one bank to another in cross-border transactions?
Geographical distribution of money market transactions in the Euro area



Source: ECB, "Measuring fragmentation in the euro area unsecured overnight interbank money market: a monetary policy transmission approach", Jens Eisenschmidt, Danielle Kedan and Robin Tietz.

Stylised example of a fragmented market, rates vs. excess liquidity

(x-axis: country-level excess liquidity; y-axis: country-level unsecured overnight interbank rate)



Notes: This is a stylised chart illustrating a symmetrical standing facilities corridor. The same broad concepts apply to an asymmetrical corridor. MLF, MRO and DFR stand for the rates that apply to the marginal lending facility, the main refinancing operations and the deposit facility, respectively. $RATE_z$ is the aggregate unsecured overnight interbank rate in the euro area for the level of aggregate excess liquidity denoted by EL_{agg}, as shown in Chart 4. EL_{agg} is the sum of excess liquidity across all countries. EL_A, EL_B, EL_C, EL_D and EL_E denote the levels of excess liquidity in countries A, B, C, D and E.

Source: ECB, "Measuring fragmentation in the euro area unsecured overnight interbank money market: a monetary policy transmission approach", Jens Eisenschmidt, Danielle Kedan and Robin Tietz.

Tiering with a relatively low multiplier, bank reserves, EUR billion

- Even a modest exemption, 5 times the minimum reserve requirement, would virtually drain all the excess reserves in the Italian, Portuguese and Greek banking systems
- Spain would face the same destiny with a multiplier of 6-7
- In these countries, money market rates could rise, probably towards zero (MRO rate)…
- … and the rise in repo rates could lead to a cheapening of short-dated government bonds
- Banks in core countries would still have ample liquidity and feel the burden of central bank deposit at the negative deposit facility rate
- These challenges could be avoided if the excess reserves were flowing from core into non-core countries, particularly into their medium-sized and smaller banks…
- … but there is no guarantee that this would happen (regulation, sovereign risks etc etc).
- Probably the ECB has to come up with a more creative tiering solution.

Source: ECB Statistical Data Warehouse, Nordea

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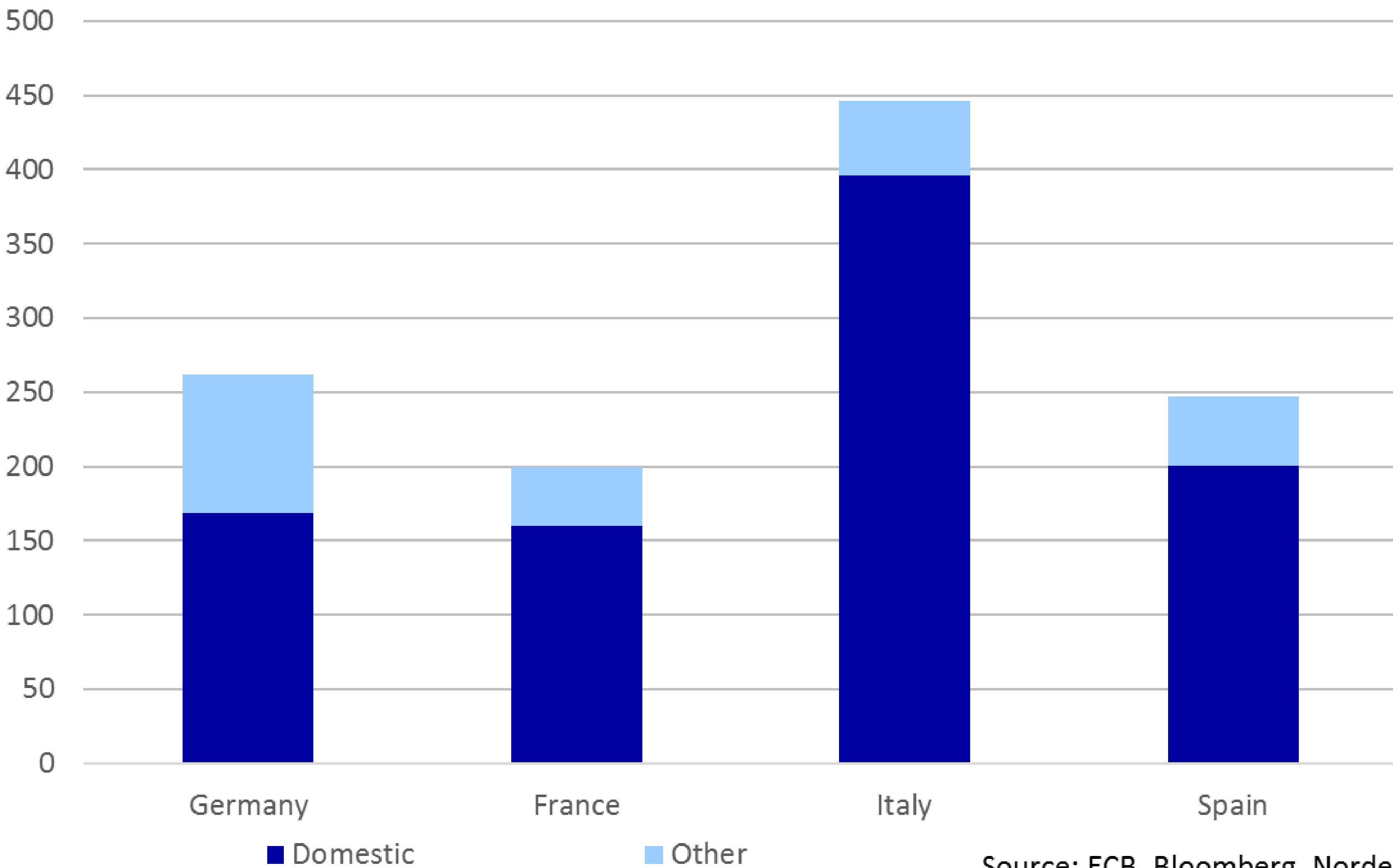
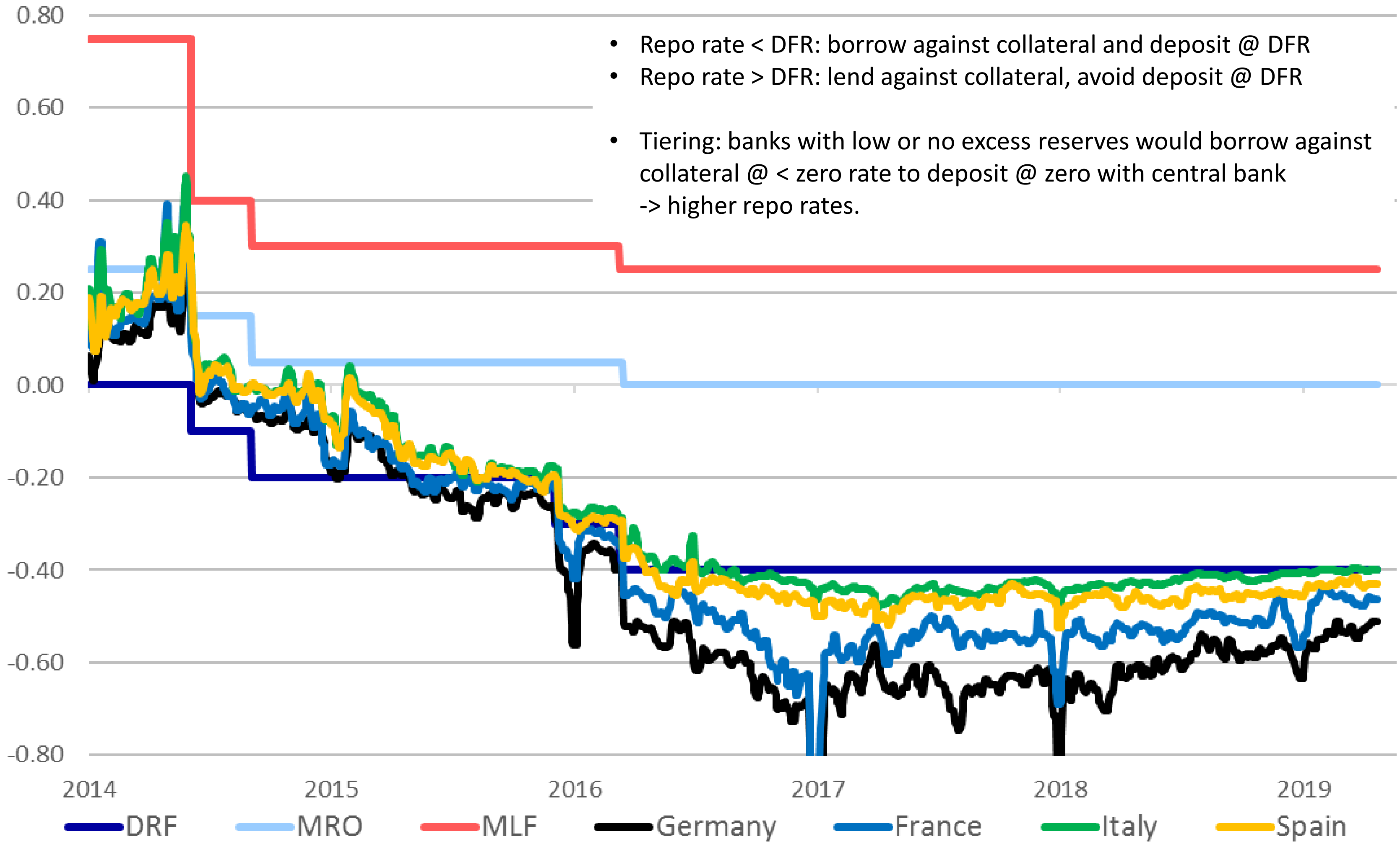
Banks in EMU-4 countries hold mainly domestic government bonds (repo collateral)
MFIs holdings of government securities other than shares as of February 2019, EUR billion



Source: ECB, Bloomberg, Nordea

National money market rates: RepoFunds rates in EMU-4 (5-day median) vs. ECB key rates



- Repo rate < DFR: borrow against collateral and deposit @ DFR
- Repo rate > DFR: lend against collateral, avoid deposit @ DFR

- Tiering: banks with low or no excess reserves would borrow against collateral @ < zero rate to deposit @ zero with central bank -> higher repo rates.

Source: Macrobond, Nordea

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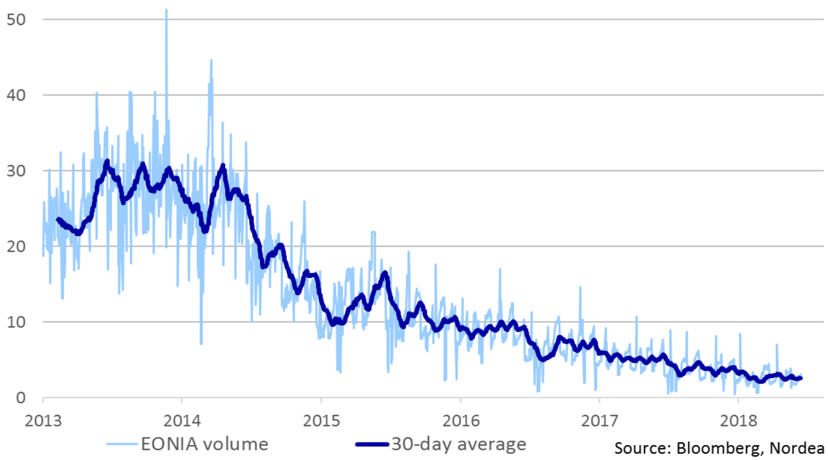
EONIA: Risks tilted towards higher fixings

- The Euro zone overnight benchmark rate has recently been fixed in thin daily volumes, amounting to around EUR 3bn
  - Compared to the bank reserves of about EUR 2000bn
  - … or unsecured overnight transactions of about EUR 60bn under the ECB money market statistical reporting
- As all the panel banks' lending transactions contribute to the fixing, even a small increase in lending activity, at rates close to zero, could lead to a spike in fixings
- A numerical example:
  - 3bn @ -36bp (as of now)
  - 3bn @ -10bp (new activity)
  - Fixing -23bp, i.e. rise of about 13bp
- It's worth bearing in mind that additional excess liquidity of only about EUR 500mm in the Greek banking system caused a jump in EONIA in late 2017 (Bloomberg story)
- To analyse EONIA more thoroughly, we should probably look at the excess reserves of the EONIA panel banks and estimate their behavior in a possible tiering system
- However, EONIA will become a tracker of the new benchmark rate €STR in October: EONIA = €STR + a fixed spread
- So let's focus on €STR

EONIA volumes, 30-day moving average, EUR billion



EONIA panel banks

Austria
Erste Group Bank AG
Belgium
Belfius
Finland
Nordea
Pohjola
France
BNP-Paribas
HSBC France
Natixis/BPCE
Crédit Industriel et Commercial CIC
Société Générale
Germany
BayernLB
Deutsche Bank
DZ Bank
Norddeutsche Landesbank Girozentrale
Landesbank Baden-Württemberg Girozentrale
Landesbank Hessen Thüringen Girozentrale
Greece
National Bank of Greece
Ireland
Bank of Ireland
Italy
Intesa Sanpaolo
Monte dei Paschi di Siena
UniCredit
Luxembourg
Banque et Caisse d'Épargne de l'État
Netherlands
ING Bank
Portugal
Caixa Geral De Depósitos (CGD)
Spain
Banco Bilbao Vizcaya Argentaria
Banco Santander
CECABANK
CaixaBank S.A.
Other EU Banks
Barclays

Source: EMMI and Nordea

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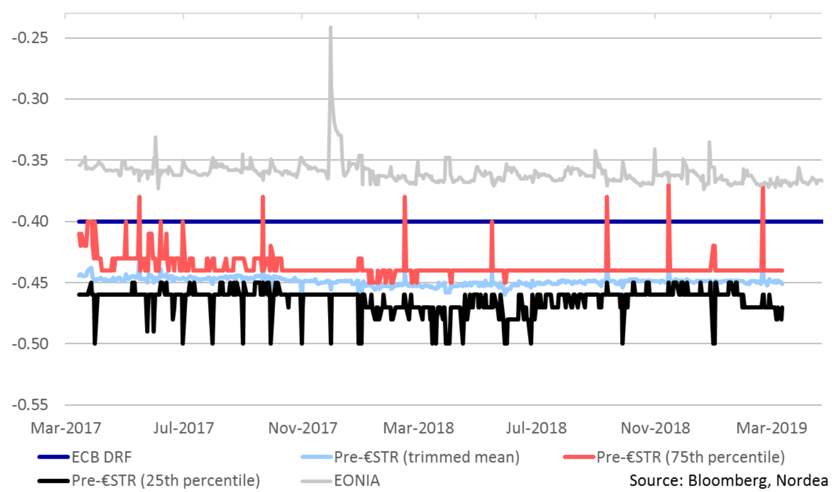
Euro short-term rate (€STR)

- Exclusively based on borrowing transactions in euro conducted with financial counterparties that 50 banks report in accordance with the MMSR Regulation.
- Overnight unsecured fixed-rate deposit transactions over EUR 1 million.
- The volume-weighted trimmed mean is calculated by:
  1. ordering transactions from the lowest rate to the highest rate.
  2. aggregating the transactions occurring at each rate level.
  3. removing the top and bottom 25% in volume terms.
  4. calculating the mean of the remaining 50% of the volume-weighted distribution of rates.
- A pro rata calculation is applied to volumes that span the thresholds for trimming to ensure that exactly 50% of the total eligible volume is used in the calculation of the volume-weighted mean.

- Due to the trimming mechanism, less vulnerable to sudden spikes and has less upward pressure than for the independent EONIA due to tiering (depending on the mechanism)
- If money market rose mainly in non-core countries, most of them would be excluded from the final calculations
- In the backtests, Italy and Spain have not been well represented (see below) in line with the distribution of the excess liquidity in the Euro system

€STR vs ECB DFR and EONIA



Source: Bloomberg, Nordea

€STR: Franco-German rate, Italy and Spain barely represented

Representativeness and concentration at bank and country level

Measure		Average	Highest	Lowest
Bank level	Five largest banks' share of total daily volumes	59%	74%	50%
	Six largest banks' share of total daily volumes	64%	78%	56%
Country level	Belgium's share of total daily volumes	15%	22%	5%
	Germany's share of total daily volumes	22%	33%	14%
	Spain's share of total daily volumes	5%	9%	1%
	France's share of total daily volumes	36%	55%	25%
	Italy's share of total daily volumes	1%	5%	0%
	Netherlands' share of total daily volumes	17%	32%	8%
	Others' share of total daily volumes	4%	8%	1%

Sources: MMSR data and ECB calculations.
Note: This table is based on daily MMSR data and covers the period from 1 August 2016 to 15 January 2018, capturing unsecured overnight transactions in the form of fixed-rate deposits.

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