

Is there a zero lower bound? The effects of negative policy rates on banks and firms

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The opinions in this presentation are those of the author and do not necessarily reflect the views of the European Central Bank, the Central Bank of Ireland, or the Eurosystem.

The transmission of monetary policy below the zero lower bound

- Heated debate about the effectiveness of monetary policy below the zero lower bound
- Two opposite views
 - **Negative interest rates policies would be ineffective or even recessive**
 - Banks would not be able to lower interest rates on deposits, because market participants would rather hoard cash. (see e.g. Keynes, 1936; Krugman, 1998; Eggertsson and Woodford, 2003; Christiano et al, 2011; Correia et al., 2013; Summers, 2014)
 - Negative and low policy rates can be contractionary because they hurt bank profitability and may depress lending (Brunnemeier and Koby, 2018)
 - **In standard New Keynesian models (with sticky price and wage adjustment), negative interest rates policies should (or can) be “central bank business as usual”**
 - (Rogoff 2018; Agarwal and Kimball, 2015; Buiters, 2009)



This paper

- Is the transmission mechanism hampered below the ZLB?
 - Do banks pass negative rates onto (corporate) depositors? Which banks do so? Does the rate of pass through decrease when policy rates move more into negative territory?
 - Safe bonds in the euro area have negative yields
 - Safe banks may also be able to do so
 - Do banks charging negative rates influence firm behavior?



An Overview of the Findings

Effects of the ECB's NIRP:

1. Sound banks pass negative rates on to corporate depositors, without experiencing a contraction in funding.
 - The effects become stronger as policy rates move deeper into negative territory.

Nearly 30% of corporate deposits in the euro area are in negative territory by the end of 2019

2. The NIRP provides stimulus mainly through firms' asset rebalancing: **Corporate channel of monetary policy**
 - Firms with high liquid assets associated with banks offering negative rates increase their investment and decrease cash-holdings.



The ECB's NIRP

Starting 2014 the ECB has decreases the policy interest rate (DFR) below zero for five times:

- June 2014: from 0 to -0.10%,
- September 2014: to -0.20%,
- December 2015: to -0.30%,
- March 2016: to -0.40%,
- September 2019: to -0.50%.

DFR is the relevant rate during the period of negative rates, because

- ✓ banks facing uncertain times tend to hold large amounts of excess liquidity
- ✓ ECB's APP since 2015 increased the volume of excess liquidity in the system

We explore the effects of the NIRP using confidential data from the euro area banks, and a comprehensive sample of firms matched to their main banks.



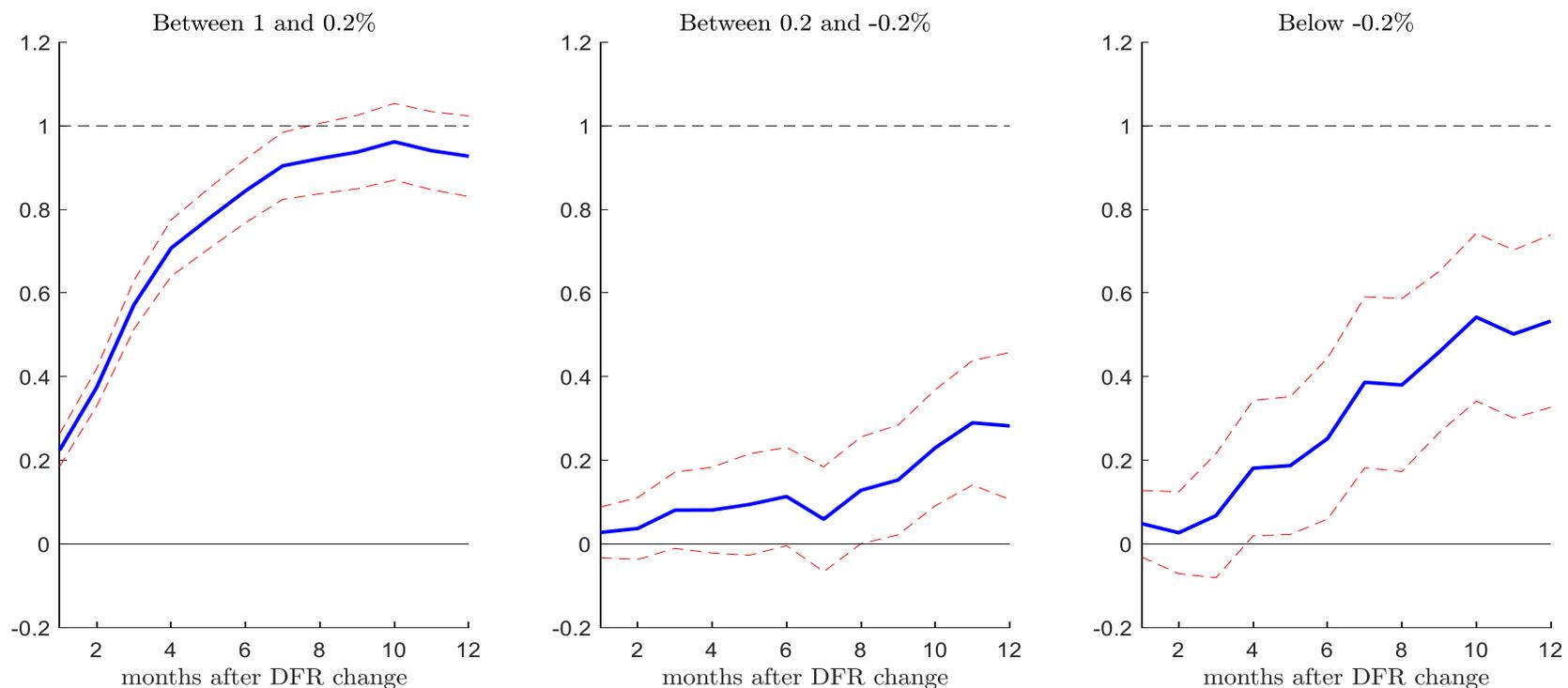
Bank Level data

- Deposits and lending rates (confidential data)
 - Individual Monetary and Financial Institutions Interest Rates (IMIR):
 - Deposits and lending rates charged for different maturities and loan sizes

- Bank level information (confidential data)
 - Individual Balance Sheet Indicators (IBSI):
 - Main asset and liability items of over 260 banks resident in the euro area from August 2007 to September 2018. Unconsolidated level.
 - CDS spreads from Datastream

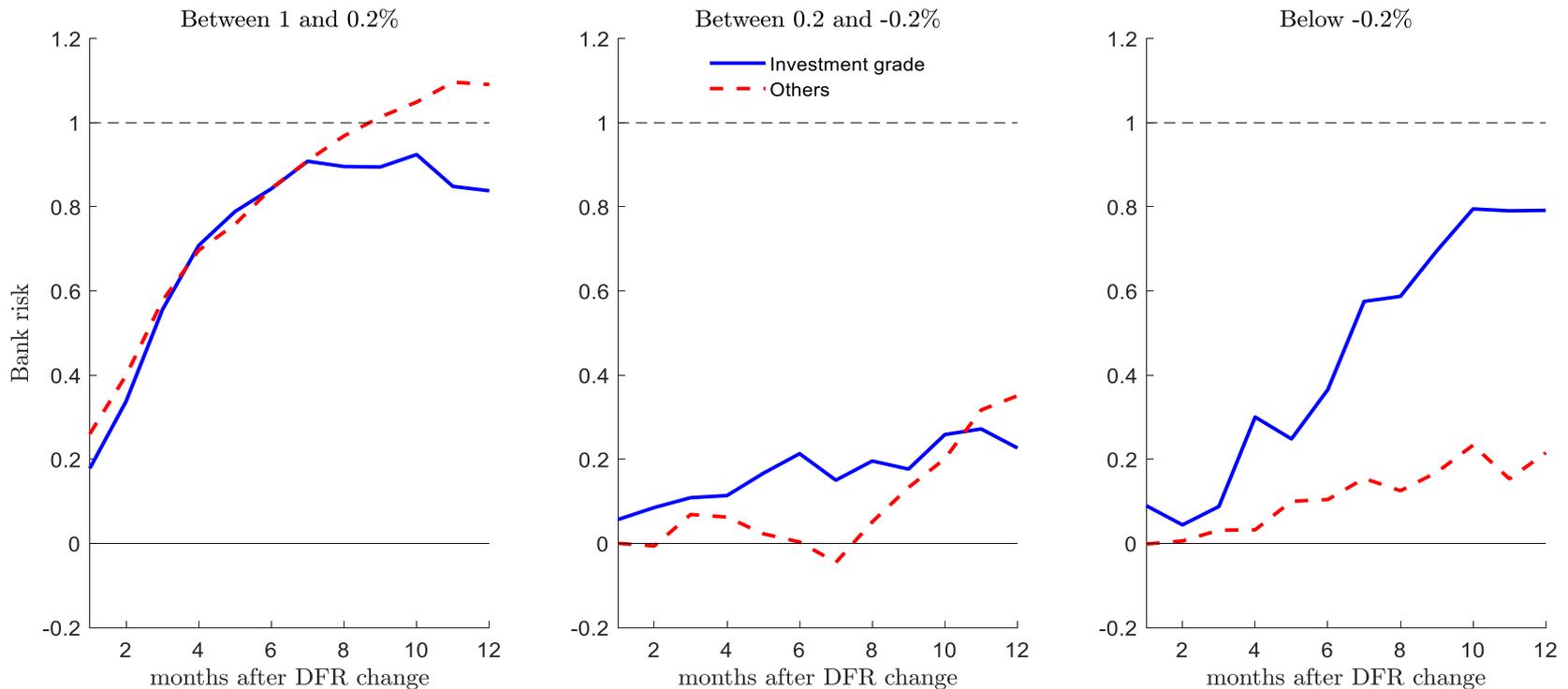
Banks' (corporate) deposit rates following policy rate cuts: Above, around, and below the ZLB

Impulse response functions estimated using a local projection model

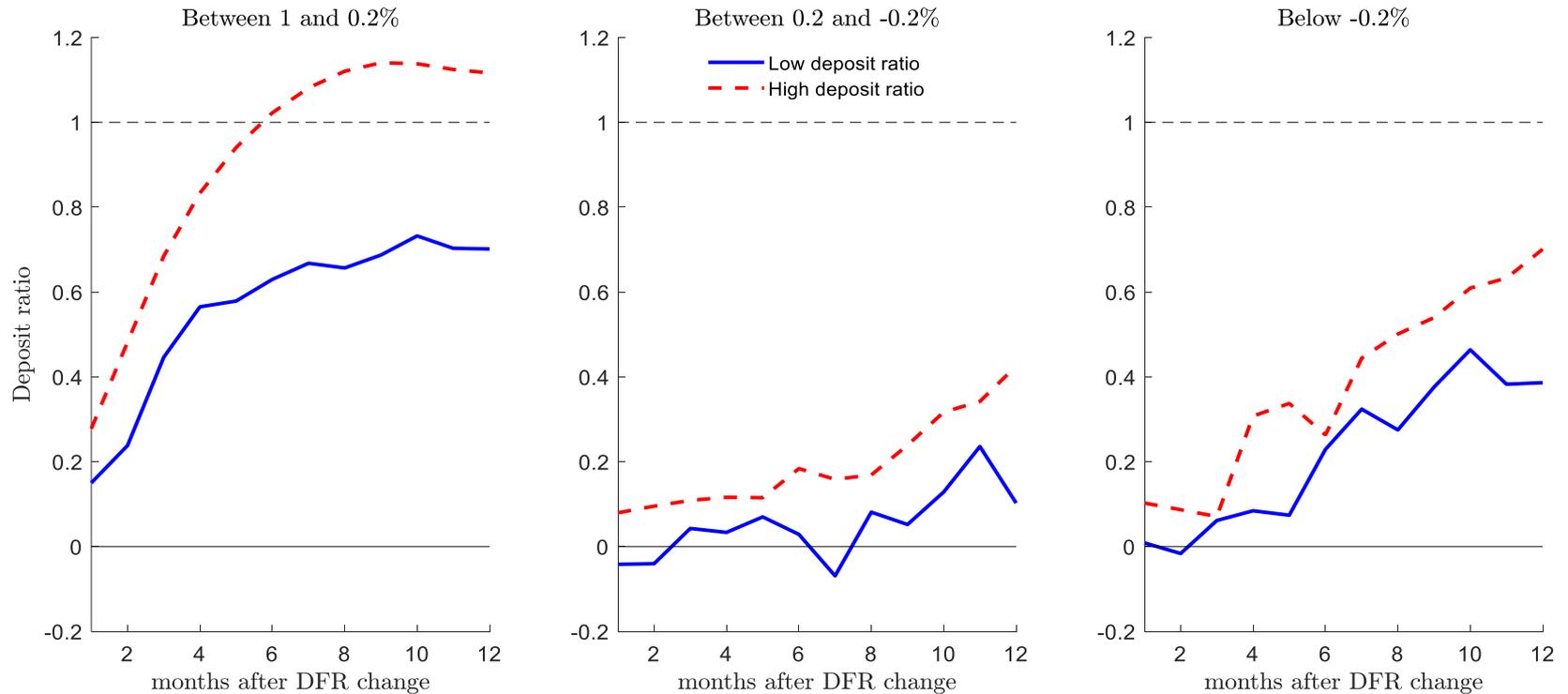


Effects similar for loan rates

Banks' deposit rates following policy rate cuts: Investment grade vs other banks

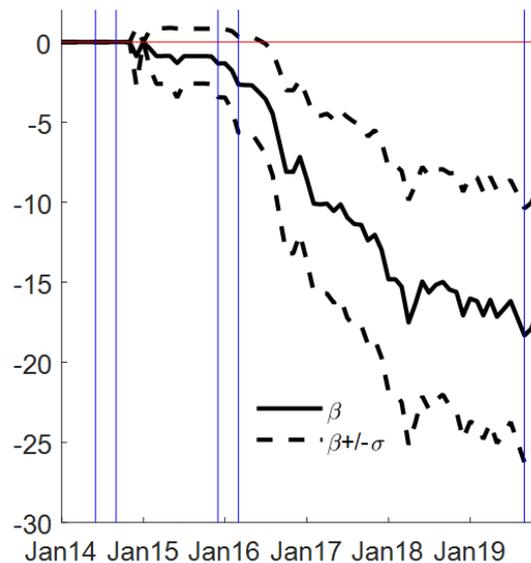


Banks' deposit rates following policy rate cuts: Does the proportion of (corporate) deposits matter?

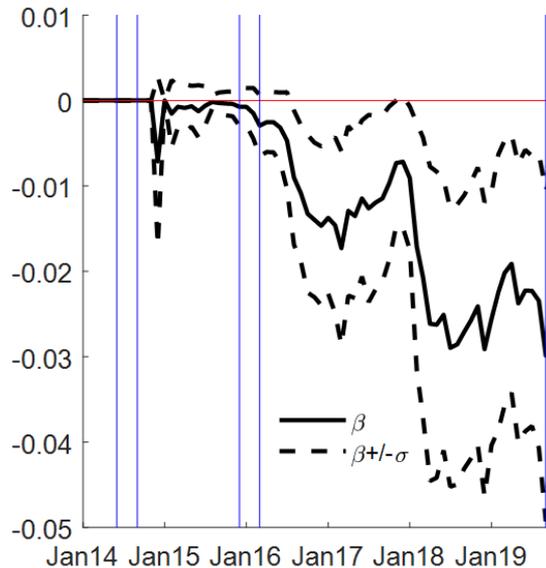


Sounds banks are progressively more likely to offer negative rates on deposits

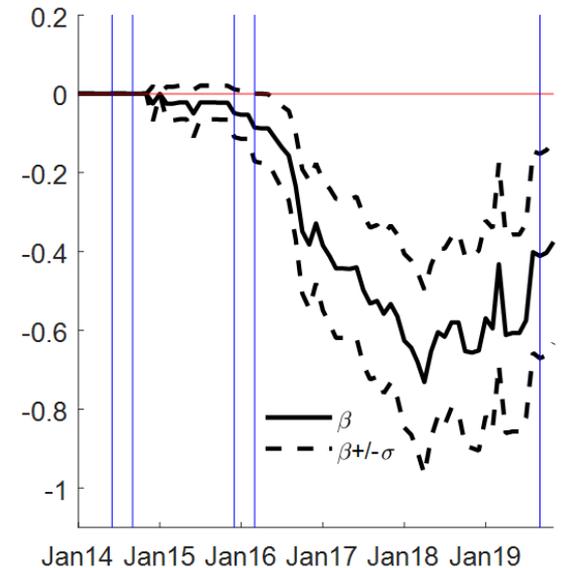
Panel A
Effect of non-investment grade rating
on the probability of negative rates



Panel B
Effect of CDS
on the probability of negative rates

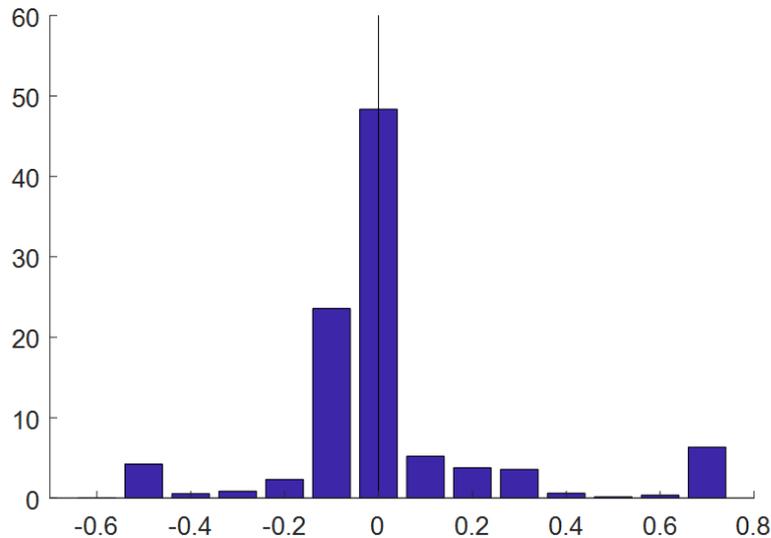


Panel C
Effect of NPL
on the probability of negative rates

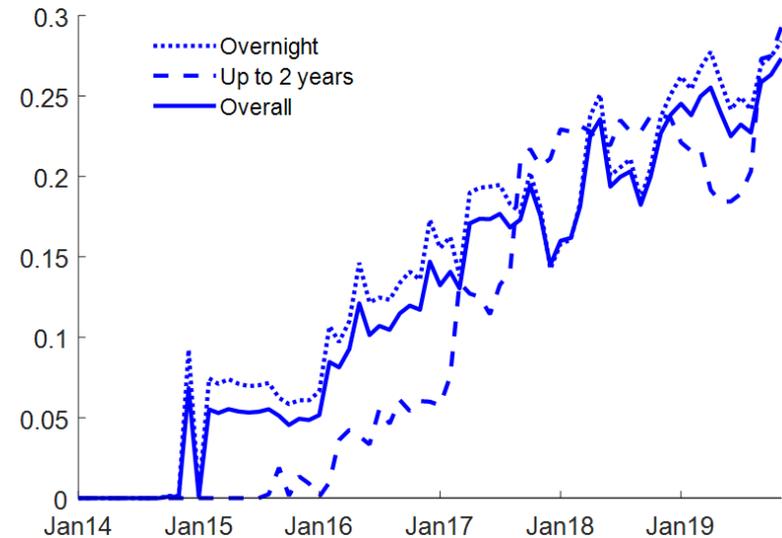


Corporate deposits with negative rates at the end of 2019

Panel A



Panel B





The Real Effects of Monetary Policy below the ZLB

- Matched firm-bank data highly representative of the euro area
 - Much more representative than datasets relying on syndicated bank loans
- Firm level information from Bureau Van Dijk's Orbis
 - Financial information on listed and unlisted companies.
 - Information on the most important banks of each firm



Firm Level Sample

- Final sample:
 - Unbalanced panel of 466K firms from 2007 to 2018
 - 12 euro area countries
 - Austria, Estonia, France, Germany, Greece, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, and Spain
 - 121 banks
 - 708 4-digit industries and 27,945 cities
- We can control for shocks faced by different firms, within a cluster, similarly to Acharya et al. (2018)

The Lending Channel and Corporate Investment

Dependent Variable:	(1) Debt/Assets	(2) Debt/Assets	(3) Investment	(4) Debt/Assets	(5) Investment	(6) Cash-holdings
High pass-through bank*Post	0.503*** (0.151)	0.302*** (0.112)	0.974 (0.652)	0.511*** (0.150)	0.859 (0.718)	-0.126* (0.067)
Bank charges negative rate	-0.194 (0.155)	-0.137 (0.138)	2.621* (1.429)	-0.234 (0.473)	-40.501*** (2.885)	6.655*** (0.508)
Exposure				0.000 (0.006)	0.597*** (0.043)	-0.092*** (0.007)
Cash-holdings (lag)				-0.073*** (0.003)	2.980*** (0.053)	0.554*** (0.007)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
City-Time FE	-	Yes	-	-	-	-
Observations	3,184,969	3,093,374	3,185,074	3,184,969	3,185,074	3,184,966
R-squared	0.842	0.848	0.171	0.843	0.235	0.909

- ✓ Healthy banks originate more credit to firms
- ✓ Precautionary behavior limits firm investment

The Corporate Channel of Monetary Policy

Dependent Variable:	(1)	(2)	(3)	(4)
Investment				
Exposure	0.556*** (0.048)	0.848*** (0.067)	1.085*** (0.171)	0.830*** (0.077)
Cash-holdings (lag)	2.989*** (0.056)	2.985*** (0.054)	3.114*** (0.045)	3.121*** (0.059)
Firm FE	Yes	Yes	Yes	Yes
Bank-Time FE	Yes	-	-	-
Bank-Sector-Time FE	-	Yes	-	Yes
Bank-Sector-City-Time FE	-	-	Yes	-
Observations	3,371,915	3,183,808	1,283,582	1,789,390
R-squared	0.230	0.262	0.427	0.287

- Firms with larger deposits at negative interest rates
banks invest more

Exposure to Negative Rates and Firms' Cash-Holdings

Dependent Variable:	(1)	(2)	(3)	(4)
Cash-holdings				
Exposure	-0.089*** (0.007)	-0.126*** (0.010)	-0.164*** (0.015)	-0.132*** (0.009)
Cash-holdings (lag)	0.552*** (0.007)	0.554*** (0.007)	0.537*** (0.009)	0.534*** (0.009)
Firm FE	Yes	Yes	Yes	Yes
Bank-Time FE	Yes	-	-	-
Bank-Sector-Time FE	-	Yes	-	Yes
Bank-Sector-City-Time FE	-	-	Yes	-
Observations	3,371,804	3,183,699	1,283,522	1,789,291
R-squared	0.906	0.912	0.931	0.911

- ✓ Cash-holdings drop
- ✓ No effects on leverage, maturity, or financial expenses



Other findings

- ❑ Firms invest more in tangible and intangible assets, but total assets do not increase
- ❑ Firm performance improve subsequently to the drop in the interest rate on deposits below zero
- ❑ Effects larger for small firms

Effects of interest rates cuts above the ZLB

Dependent Variable:	(1) Investment	(2) Cash-holdings
Exposure Low(2009-2011) * Post(2009-2011)	0.014 (0.021)	-0.000 (0.002)
Exposure Low(2012-2013) * Post(2012-2013)	-0.021 (0.095)	0.000 (0.006)
Exposure	0.556*** (0.048)	-0.089*** (0.007)
Cash-holdings (lag)	2.988*** (0.057)	0.552*** (0.007)
Firm FE	Yes	Yes
Bank-Time FE	Yes	Yes
Observations	3,371,915	3,371,804
R-squared	0.230	0.906

Conclusions

- Our analysis suggests that the current focus in the analysis of NIRPs on banks' costs of financing and net interest margin is too narrow
 - In interview to the FT, the President of the European Banking Federation, Mustier, suggested that the ECB should *“find ways of improving the “transmission mechanism” of negative rates to ensure that lenders pass them on to corporate customers, thus nudging them into investing their cash rather than keeping it on deposit”*.
- Our paper suggests that the effectiveness of the transmission mechanism below the ZLB depends on banks' balance sheet strength
 - Sound banks are more likely to pass negative rates to their corporate depositors
- Firms with more cash-holdings exposed to banks offering negative rate invest more
 - If all banks were sound and offered negative rates on corporate deposits, there could be 13% higher aggregate investment