Know Your Customer: Informed Trading by Banks

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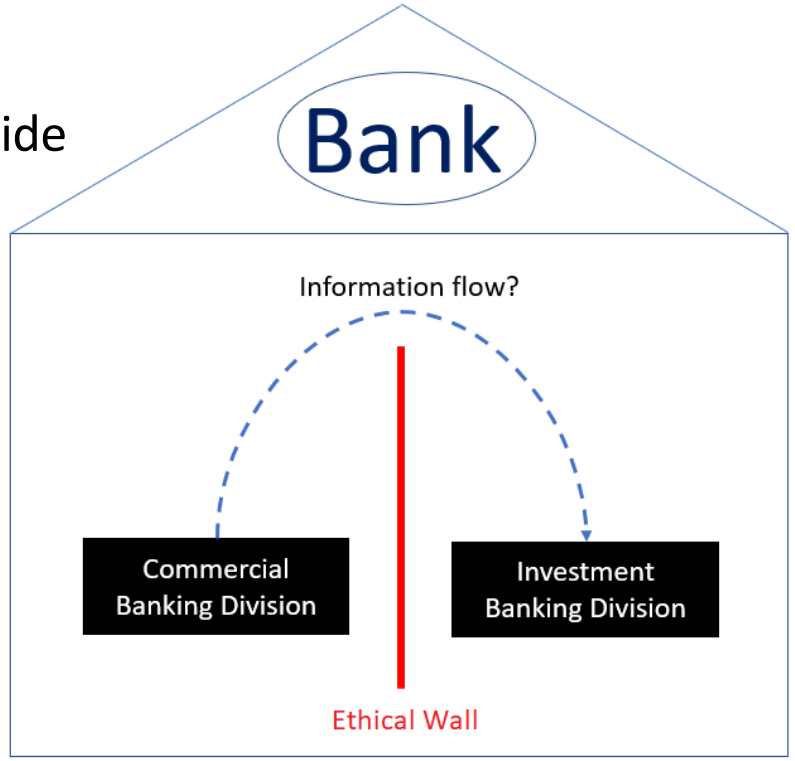
Motivation and Research Question

- Well-know conflicts of interest in (universal) banking
  - Key issue are info flows from commercial side to investment side
  - US: Long standing regulatory debate from Glass-Steagall Act to Volcker Rule
  - EU did not ban prop trading, but relies on organizational solution
- Do banks use private information from lending relationships when prop trading?



What we bring to the table

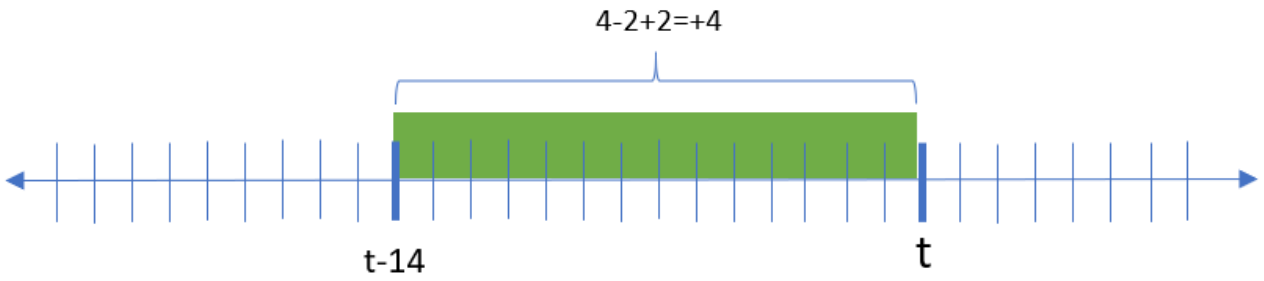
- Analyze bank prop trading and relationship lending at very granular level
- Combine several large micro-level data sets from different supervisory authorities (2012-2017)
  - Trade-level data reported by banks to Federal Financial Supervisory Authority (BaFin)
    - 168 million trades (with volume of EUR 3.5tn)
  - Detailed lending data from Deutsche Bundesbank (German credit register)
    - Universe of corporate lending exposures above EUR 1 million
  - Comprehensive database on German firms' corporate events
    - 39,994 events on earnings & dividend announcements, guidance, M&A

To fix ideas: An example from our sample

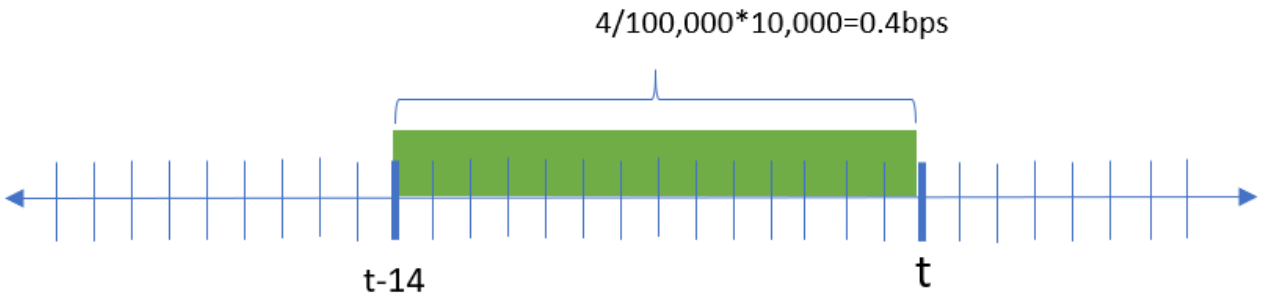
- Bank B builds up a large position in the [-7,-6] day window prior to firm F announcing its earnings
  - EA yields positive abnormal return of around 5%
  - B reduces its position after the event
  - Realizes profit around €5m
- At the time, bank B was firm F's main lender and recently granted a large loan to the firm
  - Again, it is possible that the bank has expertise

Research design: Computation of net purchases

Bank b1's trades in firm f's stock



Expressed as % of all shares outstanding (suppose 100,000)



Research design: Trading around corporate events

Bank-event level data set:

$$NetPosition_{be} = \beta_1 \text{ x } Relationship_{be} \text{ x } Pos_e + \beta_2 \text{ x } Relationship_{be} + \gamma_e + \gamma_{bs} + \varepsilon_{be}$$

- $NetPosition_{be}$ is defined as $\frac{shares\ purchased - shares\ sold}{shares\ outstanding} \times 10{,}000$ by bank *b* in firm *f* during [-14, -1] day window prior to event *e* (Griffin et al. 2012 RFS)
- $Relationship_{be}$ = 1 if bank is largest lender or has loan share > 25%
- Pos_e = 1 if market-adj. return of firm *f* in [-1, +1] around event is positive
- Fixed effects: **Each** corporate event (γ_e) and bank x industry (γ_{bs})

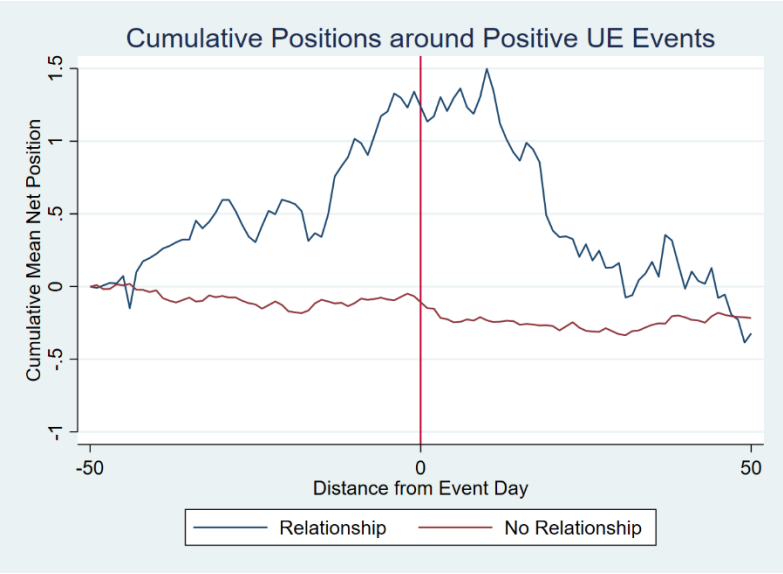
Base results

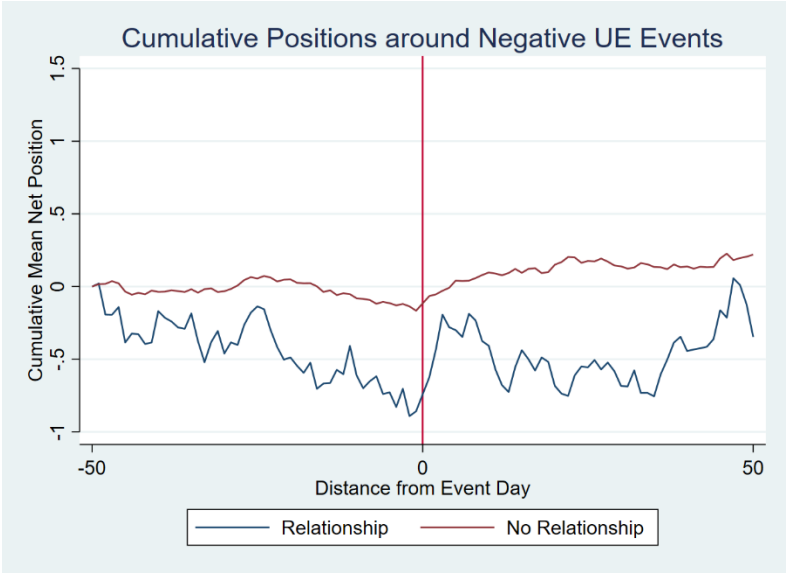
Dependent variable:	Net Purchases [-14,-1]					
	(1)	(2)	(3)	(4)	(5)	(6)
Relationship	0.0278	0.0251	0.0042	-0.0707***	-0.0345	-0.0961**
	(1.00)	(0.86)	(0.25)	(-3.56)	(-0.47)	(-2.05)
Relationship x Pos	0.0331***	0.0343***	0.0318***	0.1982***	0.0326	0.3069***
	(3.51)	(3.53)	(3.23)	(3.77)	(0.27)	(3.55)
Event FE	no	yes	yes	yes	yes	yes
Bank x SIC FE	no	no	yes	yes	yes	yes
Events	All	All	All	UE	UE	UE
Abs. Event Return	-	-	-	-	<2%	>2%
Observations	1,439,610	1,439,610	1,439,610	186,308	76,046	110,027
Adj.R^2	0.0001	0.0035	0.0049	0.0054	0.0126	0.0045

- Expertise matters most for scheduled events (e.g., EA)
- Study unscheduled events (e.g., management forecasts, profits warnings)
  - Stronger effects before unscheduled events (pos and neg)
  - Remarkable as these events are harder to anticipate
- Effects are stronger for "bigger" news (or surprises) – **also M&A events**

Net positions over time

- Mapping out for unscheduled E-related events w/ bigger news (>2%):





- Net purchases (or sales) shortly before events and reversal afterwards

Trading in the "right" direction: Suspicious trades

Dependent variable:	Suspicious Trade
	(2)
Relationship	0.0619***
	(3.15)
Event FE	yes
Bank x SIC FE	yes
Abs. Event Return	>2%
Observations	13,300
Mean Dep. Var. for Non-Rel.	0.2582

- Suspicious trade: Trading in right direction before **and** after for positive or negative event
  - For all banks, baseline prob is pushed from 25% to 25.8%
- Relationship banks increase this prob by 6.2pp (to 32%)

Profitability of relationship trading

- Compute in the same way banks manage their trading desks
  - MTM daily positions:

Dependent variable:	Quarterly Profit			
	(1)	(2)	(3)	(4)
Relationship	399,714**	405,548**	431,012**	800,810*
	(2.43)	(2.12)	(2.19)	(1.65)
Bank FE	yes	-	-	-
Bank x SIC FE	no	yes	yes	-
Firm FE	no	no	yes	-
Bank x Firm FE	no	no	no	yes
N	115,402	115,284	115,284	114,018

  - Average (median) sample bank maintains 5 (10) relationships in a given quarter

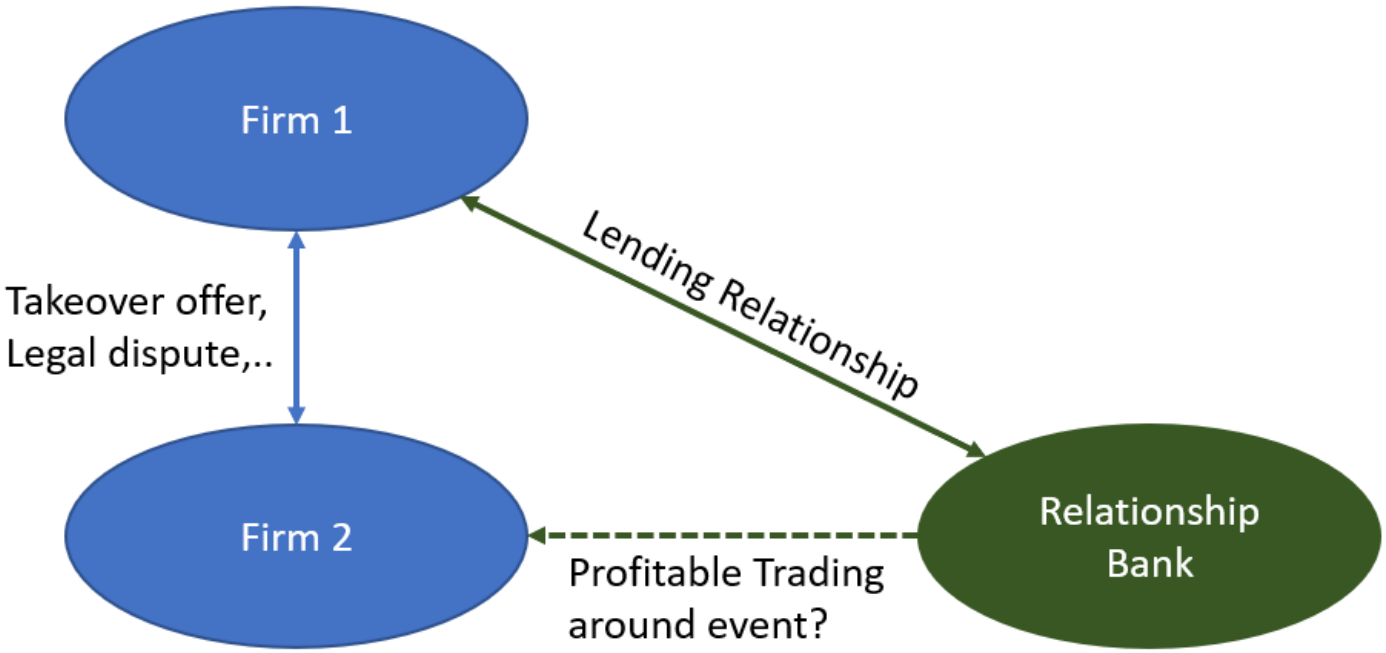
Relationship trading vs. bank expertise

Dependent variable:	Net Purchases [-14,-1]			
	(1)	(2)	(3)	(4)
Relationship x Pos	0.2728***	0.2712***	0.2733***	0.5353***
	(3.26)	(3.30)	(3.26)	(3.04)
Non-Rel. Periods x Pos		-0.0653		
		(-0.55)		
After-Rel. Periods x Pos			0.0300	
			(0.24)	
Event FE	yes	yes	yes	yes
Bank x Firm FE	yes	yes	yes	-
Bank x Firm x Year FE	no	no	no	yes
Events	UE	UE	UE	UE
Abs. Event Return	>2%	>2%	>2%	>2%
Observations	106,408	106,408	106,408	75,435

- Expertise should be longer-lived; info flows depend on relationship
- Trading effects are in “sync” with bank relationship

Third-party events

- News events that pertain to firm 1 with lending relationship and another third party (firm 2)
- Bank has no relationship with firm 2



Trading in third-party events

Dependent variable:	Suspicious Trade					
	(1)	(2)	(3)	(4)	(5)	(6)
RB third party trades	0.1988**	0.3063***				
	(2.66)	(2.97)				
Other RB trades			-0.0078	-0.0076	-0.0064	-0.0183
(in unrel. firm)			(-0.59)	(-0.60)	(-0.23)	(-0.58)
Control for Other RBs	yes	yes	yes	yes	yes	yes
Event FE	yes	yes	yes	yes	yes	yes
Bank x SIC FE	yes	yes	yes	yes	yes	yes
Events	Third Party	Third Party	All	All	UE	UE
Overlap Excluded	no	yes	no	yes	no	yes
Abs. Event Return	>2%	>2%	>2%	>2%	>2%	>2%
Observations	742	533	75,166	50,275	13,288	6,492

- Banks trade in "right" direction ahead of events of **other** firms **that involve one of their borrowers**
- No effect for other events of the same third-party (difficult to explain with expertise)

Indirect Channel: Risk management

- Central risk management requires info from both the lending and the investment side of the bank ("above the wall")

Dependent variable:	Net Purchases [-14,-1]			
	(1)	(2)	(3)	(4)
Relationship x Short	0.4092***	0.5014***	0.2124	0.2303
	(4.37)	(3.13)	(1.59)	(1.43)
Relationship x Long	-0.0450	0.0218	-0.3848**	-0.3009**
	(-0.26)	(0.11)	(-2.34)	(-2.17)
Relationship	0.2247**	0.1974**	0.0075	-0.0554
	(2.12)	(2.61)	(0.08)	(-1.48)
Event FE	yes	yes	yes	yes
Bank x SIC FE	yes	yes	yes	yes
Events	Pos UE	Pos UE	Neg UE	Neg UE
Abs. Event Return	>2%	>2%	>2%	>2%
Only Above-Median	no	yes	no	yes
Observations	56,964	56,964	52,687	52,687

Direct Channels / Flying under the radar?

- Supervisor more likely to scrutinize large trades & events with large returns
  - Banks built up "suspicious" positions **with many small trades**
  - Holds with bank-firm FE, so trading pattern changes when rel. bank
  - All the action in medium return size events (2-10%)
    - No effects for events with very large returns (>10%)
- What about market participants?
  - Counter-party is known in the OTC markets
  - Have granular intra-day data can estimate price protection in OTC market for same stock-event pair relative to exchange (RB vs. non-RB)
  - Find relationship banks obtain worse prices in OTC (others are aware)
  - Banks respond by building positions on exchanges rather than OTC market

Conclusion

- Banks engage in profitable prop trading ahead of corporate events when they are the main lender
- Evidence is strongest for events that should be harder to anticipate (e.g., unscheduled profit warnings, M&A)

- Main take-aways
  - Combining large data sets can uncover unusual trading patterns
    - Could improve supervisory practices
    - One motivation for FINRA's Consolidated Audit Trail
  - Information flows within universal banks, despite ethical walls
  - Risk management is a source of these flows

Thank You

Assessing magnitude of informed trading

- Assessing economic magnitude is tricky
  - Banks are unlikely to have private info for every event
  - Event trading captures only a fraction of trading profits
- Action could be in the tails
  - Winsorize net purchases, so results describe systematic trading patterns
  - Aggregate: Relationship trades contribute 14% of total event trading profit, even though corporate events with relationships account for only 1% of all bank-event combinations
- Gauge expertise relative to trading at random
  - Evaluate how often banks trade in the “right” direction

Descriptive evidence on banks' prop trading

- Event stats:
  - For about 98% of the events at least one bank prop trades in pre-window
  - Prop trading can be sizeable relative to daily trading volume
  - On average 9 out 47 sample banks, prop trade for a given event
  - 19% of the bank-event combinations have non-zero positions
- Net positions built ahead of the events:
  - Median positive (negative) net position is 0.27bp (-0.24bp) of shares outst.
    - Banks' net positions are sizeable but small relative to market cap
  - Banks' net positions are large relative to their holdings in prior quarter
    - Net position built is larger than prior holding in 33% of cases
  - In 25% of all cases, bank builds a position but had no prior holding

Institutional background

- Insider trading is prohibited in EU
  - But there is a grey zone
- MAR (Art. 9) lists exceptions when trading even in the presence of inside information is permitted: e.g.,
  - Legal person (bank) has inside info but adequate and effective internal arrangements prevent natural persons (traders) from using it
  - In the normal course of market making
  - To discharge an obligation incurred before info was obtained
  - To facilitate certain capital market transactions (e.g., M&A)
- Regulation relies on effective organizational structures (walls)
  - Structures apply also to individuals on “public side” for broker-dealers

Information flows: New loans

Dependent variable:	Net Purchases [-14,-1]					
	(1)	(2)	(3)	(4)	(5)	(6)
RB Loan Share x Pos	0.5646***	0.5629***				
	(4.05)	(3.53)				
Relationship NL x Pos			0.4435**	1.6499**	0.7578***	0.8471***
			(2.07)	(2.02)	(3.33)	(2.87)
Relationship NoNL x Pos			0.2876***	0.2817***	0.2851***	0.2433***
			(3.43)	(3.08)	(3.35)	(2.96)
Event FE	yes	yes	yes	yes	yes	yes
Bank x SIC FE	yes	-	yes	yes	yes	-
Bank x Firm FE	no	yes	no	no	no	yes
Events	UE	UE	UE	UE	UE	UE
New Loan Threshold	-	-	33%, €2m	33%, €50m	33%, 10pp	33%, 10pp
Abs. Event Return	>2%	>2%	>2%	>2%	>2%	>2%
Observations	110,027	106,408	110,027	110,027	110,027	106,408
p-value of F-test	-	-	0.4444	0.0994*	0.0202**	0.0325**

- Effect increases when rel. bank recently granted a new loan

SEC Staff Summary Report

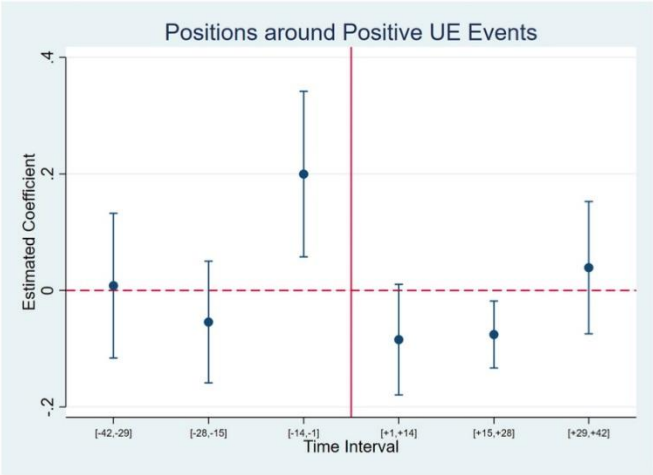
- Examination of ethical walls and organizational info barriers at U.S. broker-dealers
  - Programs that exist at broker-dealers to protect against the misuse of material nonpublic information ("MNPI")
  - Broker-dealers may receive MNPI regarding their clients and market events as part of their business operations
  - Broker-dealers classify business groups as "public-side" or "private-side"
    - Latter has routine access to MNPI;
    - Sales and trading is on public side
- Findings:
  - Significant amount of interaction between groups that have MNPI and groups that have sales and trading responsibilities occurred on an informal (undocumented) basis
    - High frequency of the discussions and the absence of documentation may make it difficult to trace any inadvertent (or even intentional) disclosures that may occur
  - At some broker-dealers, senior executives, referred to as "above-the-wall," received MNPI with no related monitoring or restrictions
    - Raises serious concerns about the ability of broker-dealers to guard adequately against misuse of MNPI in firm and customer trading
  - The staff identified gaps in oversight coverage at most broker-dealers, although such gaps differed

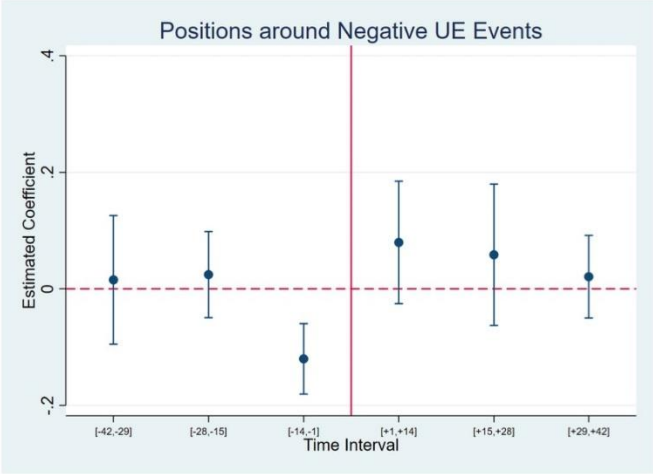
Risk Management as a Pathway: Regulatory Approach

Dependent variable:	Net Purchases (1)	Return x Direction (2)	Suspicious Trade (3)
Relationship AIRB	-0.1075	0.0040***	0.0718***
	(-1.65)	(6.84)	(3.92)
Relationship FIRB	-0.0251	0.0019	0.0178
	(-0.51)	(1.42)	(0.78)
Relationship AIRB x Pos	0.4364***		
	(8.38)		
Relationship FIRB x Pos	0.0421		
	(0.84)		
Event FE	yes	yes	yes
Bank x SIC FE	yes	yes	yes
Events	UE	UE	UE
Abs. Event Return	>2%	>2%	>2%
Observations	110,027	110,027	13,300

- RelAIRB (RelFIRB) means that the relationship bank applies the advanced (foundation) IRB approach to a borrower
- Effect concentrated on cases where banks risk management possesses most information

Relationship Trading – Mapping out Estimates over Time





Descriptive Statistics

Panel A: Corporate Events and Event Returns

Event Category	N	Return Distribution		Relevance Score
		p25	p75	
Earnings	11,484	-0.0204	0.0242	62
Earnings announcement	8,238	-0.0213	0.0249	62
Pre-announcement	1,978	-0.0233	0.0289	68
Other financial reporting	1,268	-0.0131	0.0150	55
Guidance	6,808	-0.0233	0.0257	67
Guidance at EA	5,400	-0.0231	0.0257	67
Stand-alone forecast	1,408	-0.0248	0.0261	67
Dividends	3,168	-0.0155	0.0233	62
Unscheduled dividend events	605	-0.0316	0.0226	72
M&A	6,303	-0.0114	0.0181	57
Firm is target	1,749	-0.0123	0.0296	64
Board/Executives	2,015	-0.0137	0.0149	53
Capital structure	3,239	-0.0161	0.0182	57
Legal	600	-0.0156	0.0119	59
Operating	6,361	-0.0101	0.0135	53
Bankruptcy	16	-0.4862	-0.0851	94

Panel B: Non-Financial Firms (Borrowers)

	N	Mean	p1	p25	p50	p75	p99
Market Capitalization (€m.)	618	2,220	1.02	25.45	93.16	508.58	50,369
Number of Shares Outst. (m.)	618	63.46	0.05	3.99	9.73	31.81	1,069
Firm is in Prime Standard	618	0.39	0	0	0	1	1
Number of Events per Firm	618	64.72	1	11	40	92	485
Number of UE-Events per Firm	618	6.42	0	1	4	10	26

Descriptive Statistics (Continued)

Panel C: Lending Relationships of and Proprietary Trading by Banks

	N	Mean	Median	SD
Average Loan Exposure to Sample Firms (€m.)	47	1,127	43	2,415
Number of Firms for which a Bank is Relationship Bank	47	16.21	1	37.87
Number of Different Sample Stocks Traded per Day	47	50.00	15.07	83.21
Number of Prop Trades in Sample Stocks per Day	47	2,361	149	7,451
Trading Volume in Sample Stocks per Day (€m.)	47	49.37	3.41	138.57
Average Trade Size (€)	47	41,881	23,033	93,012
Average Long Position (€m.)	33	5.24	0.12	11.61
Average Short Position (€m.)	28	-4.20	-0.12	18.44
Fraction of Events with Trading in [-14,-1] Window	47	0.19	0.08	0.23

Panel D: Trades at the Bank-Event Level

	N	Mean	p1	p25	p50	p75	p99
Relationship Bank	1,879,718	0.0157	0	0	0	0	1
Loan Share if Rel. Bank	29,575	0.39	0.11	0.23	0.31	0.48	1
Net Purchases [-14,-1] conditional on Trading	355,402	0.0591	-20.15	-0.24	0.00	0.27	25.25

Supervisory Radar: Trade Frequency

Dependent variable:	Suspicious Trade			
	(1)	(2)	(3)	(4)
Relationship x ln(Trades)	0.0275***			
	(2.83)			
Relationship x Many Trades		0.1007***	0.1293***	0.1238***
		(2.83)	(2.77)	(2.75)
Control for Net Purchases Size	yes	yes	yes	yes
Event FE	yes	yes	yes	yes
Bank x SIC FE	yes	yes	yes	-
Bank x Firm FE	no	no	no	yes
'Many Trades' Threshold	-	P50	P75	P50
Events	UE	UE	UE	UE
Abs. Event Return	>2%	>2%	>2%	>2%
Observations	13,300	13,300	13,300	12,657

Supervisory Radar: Event Return

Dependent variable:	Net Purchases [-14,-1]			
	(1)	(2)	(3)	(4)
Relationship	-0.0345	-0.1454***	-0.1511	0.0886
	(-0.47)	(-3.35)	(-1.09)	(0.49)
Relationship x Pos	0.0326	0.3414***	0.4023***	0.0256
	(0.27)	(2.94)	(2.93)	(0.23)
Event FE	yes	yes	yes	yes
Bank x SIC FE	yes	yes	yes	yes
Events	UE	UE	UE	UE
Abs. Event Return	<2%	2-6%	6-10%	>10%
Observations	76,046	71,769	21,150	15,745

Relationship Trading Around M&A Events

Dependent variable:	Net Purchases [-14,-1]					
	All M&A		M&A Target		M&A Seller	
	(1)	(2)	(3)	(4)	(5)	(6)
Relationship x Pos	0.1564***	0.2343**	0.2324**	0.3016**	0.6269***	0.7927***
	(2.97)	(2.31)	(2.22)	(2.44)	(2.95)	(3.21)
Event FE	yes	yes	yes	yes	yes	yes
Bank x SIC FE	yes	-	yes	-	yes	-
Bank x Firm FE	no	yes	no	yes	no	yes
Overlap Excluded	yes	yes	yes	yes	yes	yes
Abs. Event Return	>2%	>2%	>2%	>2%	>2%	>2%
Observations	88,924	83,190	35,720	29,798	11,703	9,118

Price protection against relationship banks

Dependent variable:	Price Difference (€)		Price Dif. (rel. to Spread)	
	(1)	(2)	(3)	(4)
OTC	0.0106***	-0.0087***	0.2381***	-0.2049***
	(9.47)	(-8.40)	(10.69)	(-9.75)
Control for Log Trade Volume	yes	yes	yes	yes
Trade Direction	buy	sell	buy	sell
Observations	5,623,962	5,589,207	5,620,490	5,585,696

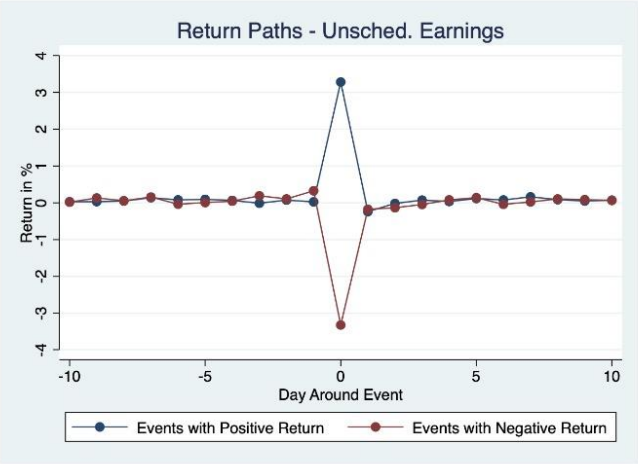
- Counterparty observable in OTC trades
- Higher (Lower) Price charged when selling to (buying from) a relationship bank

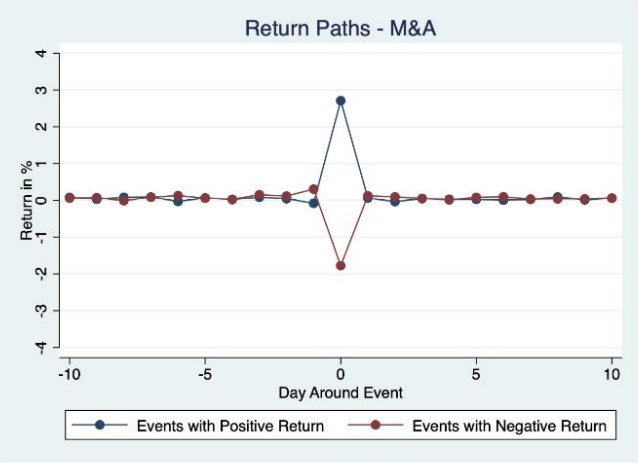
Response to price protection

Dependent variable:	Net Purchases [-14,-1]					
	(1)	(2)	(3)	(4)	(5)	(6)
Relationship x ExchgIntens	0.6876**			0.3663		
	(2.17)			(1.15)		
Relationship x MostlyExchg		0.4117***	1.0298***		-0.0383	-0.3954
		(3.61)	(3.91)		(-0.12)	(-0.57)
Bank x SIC FE	yes	yes	yes	yes	yes	yes
Event FE	yes	yes	yes	yes	yes	yes
Abs. Event Return	>2%	>2%	>2%	>2%	>2%	>2%
Abs. Net Purchases	>0	>0	>0.5	>0	>0	>0.5
Events	Pos	Pos	Pos	Neg	Neg	Neg
N	7,794	7,794	3,439	7,689	7,689	3,545

- Relationship Banks are more likely to build up their net positions on exchanges rather than OTC

Return Paths Around Selected Event Categories





Prop Trading over Time

Year	Trading Volume (€bn)	# of Trades (m)	Average Trade Size (€)
2012	494	25	19,459
2013	511	28	18,437
2014	552	26	20,911
2015	788	33	23,553
2016	544	29	18,840
2017	636	26	24,431
Sum	3,525	168	20,982

Probability of Trading in the Right Direction

Dependent variable:	Trade in Right Direction					
	(1)	(2)	(3)	(4)	(5)	(6)
Relationship	0.0131***	0.0131***	0.0073	0.0503**	0.0031	0.0923***
	(3.20)	(3.31)	(1.55)	(2.28)	(0.11)	(4.15)
Event FE	no	yes	yes	yes	yes	yes
Bank x SIC FE	no	no	yes	yes	yes	yes
Events	All	All	All	UE	UE	UE
Event Return	-	-	-	-	<2%	>2%
Observations	272,859	270,881	270,714	28,377	12,419	15,740

Mapping out Bank Trading Around Corporate Events

Dependent variable:	Net Purchases					
	[-42,-29]	[-28,-15]	[-14,-1]	[+1,+14]	[+15,+28]	[+29,+42]
Relationship	0.0303	0.0018	-0.0074	0.0857*	0.0307	-0.0132
	(1.20)	(0.15)	(-0.58)	(1.75)	(1.40)	(-0.70)
Relationship x Pos	-0.0164	-0.0074	0.0557***	-0.0954**	-0.0416**	0.0352
	(-1.00)	(-0.44)	(4.58)	(-2.08)	(-2.14)	(1.44)
Event FE	yes	yes	yes	yes	yes	yes
Bank x SIC FE	yes	yes	yes	yes	yes	yes
Abs. Event Return	>2%	>2%	>2%	>2%	>2%	>2%
Observations	635,205	635,205	635,205	635,205	635,205	635,205

Panel Analysis at the Bank x Event x Time Level

Dependent variable:	Net Purchases			
	(1)	(2)	(3)	(4)
Relationship x [-28,-15]	0.0206	0.0243	0.0021	-0.0294
	(0.51)	(0.31)	(0.02)	(-0.41)
Relationship x [-14,-1]	-0.1241***	-0.2900***	-0.5065***	-0.1876**
	(3.85)	(-4.61)	(-4.07)	(-2.08)
Relationship x [+1,+14]	0.0758	0.0641	0.0649	0.0252
	(1.31)	(0.53)	(0.35)	(0.28)
Relationship x [+15,+28]	0.0546	0.0982	0.1988	0.1768
	(0.96)	(0.78)	(0.86)	(1.46)
Relationship x Pos x [-28,-15]	-0.0769	-0.1454	-0.1743	-0.1115
	(-0.93)	(-0.87)	(-0.72)	(-1.05)
Relationship x Pos x [-14,-1]	0.3216***	0.7056***	1.3224***	0.5733***
	(3.31)	(4.42)	(5.55)	(3.41)
Relationship x Pos x [+1,+14]	-0.1623**	-0.2431	-0.2804	-0.1571
	(-2.16)	(-1.50)	(-1.18)	(-0.97)
Relationship x Pos x [+15,+28]	-0.1324***	-0.3236***	-0.5522***	-0.3973***
	(-3.05)	(-3.90)	(-4.25)	(-4.27)
Bank x Event FE	yes	yes	yes	yes
Events	UE	UE	UE	UE
Abs. Net Purchases	-	>0	>0.5	>0 in [-84,-70]
Abs. Event Return	>2%	>2%	>2%	>2%
Observations	881,344	121,286	56,475	121,504

Option Trading and Client Trading

Dependent variable:	Net Purchases [-14,-1]							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Relationship x Pos	0.0025	0.0936	0.2759***	0.0400	0.0011	0.2948**	0.0208	0.1411
	(0.57)	(0.64)	(3.33)	(1.10)	(0.02)	(2.10)	(0.70)	(0.92)
Event FE	yes	yes	yes	yes	yes	yes	yes	yes
Bank x SIC FE	yes	yes	yes	yes	yes	yes	yes	yes
Events	UE	UE	UE	UE	UE	UE	UE	UE
Securities	Options	Options	Eq.+Opt. Netted	Equity	Equity	Equity	Equity	Equity
Trade Classification	PropMM	PropMM	PropMM	Clients	Clients	PropMM - Clients	MM	MM
Abs. Net Purchases	-	>0	-	-	>0	-	-	>0
Abs. Event Return	>2%	>2%	>2%	>2%	>2%	>2%	>2%	>2%
Observations	110,027	169	110,027	110,027	36,594	110,027	110,027	14,294