Slow capital, fast prices:
Shocks to funding liquidity and stock price reversals

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Federal Reserve Board

Stock market volatility during 2008/2009

This paper

German stock market during Great Depression

- 5 big banks acted like market makers
- Each bank provided liquidity to a different subset of stocks
- I identify a shock to the funding liquidity of one bank, the Danatbank
    - 11 May 1931: Largest borrower is near bankruptcy
    - During May 1931: Constrained liquidity provision of Danatbank to each of its other firms
  $\Rightarrow$ Difference-in-differences approach

Main results:

- Increase in illiquidity measured by order imbalances
- V-shaped price patterns

Main results
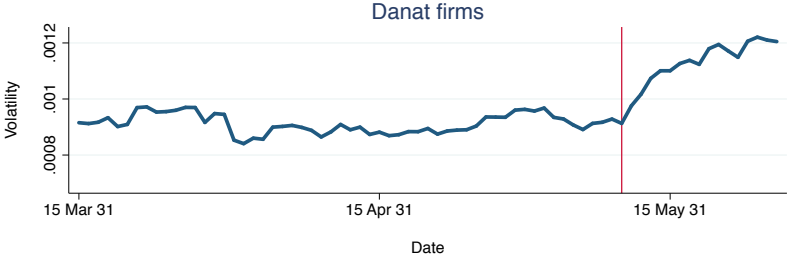
Related Literature

- Limits to arbitrage and frictional finance
  - De Long et al. 1990, Duffie et al. 2005, Biais 2011
- Price pressure and V-shaped price patterns
  - Kraus and Stoll 1972, Coval and Stafford 2007, Duffie 2010, Hendershott and Menkveld 2013
- Intermediary's balance sheet and asset prices
  - Coughenour and Saad 2004, Comerton-Forde et al 2010, Adrian and Shin 2010
  - Gromb and Vayanos 2002, Brunnermeier and Pedersen 2009
- Pre-WW II Germany
  - De Long and Becht 1994: no excess volatility in pre-WW II German stock market

Historical background
The big Berlin banks as liquidity providers

- Interwar Germany: only 5 universal banks
- Banks held close connections to firms
    - Creditor, underwriter, supervisory board etc.
- On the stock exchange, banks acted like market makers for stocks of connected firms

Historical background
The big Berlin banks as liquidity providers

> *" ...sometimes the demand or supply of a few shares can lead to unreasonable price increases or decreases. Here it is the task of the bank to provide liquidity in order to establish a more balanced price setting. The underwriting bank can fulfill this task best, since it is mostly better informed about the true value of the shares... " (A. Weber 1915)*

The funding liquidity shock

- Danatbank 's largest borrower: Nordwolle
  - Credit: 80% of Danatbank's equity
- May 1931: Nordwolle on the verge of bankruptcy
- Danatbank's CEO Goldschmidt: "Nordwolle goes down, Danat goes down, I go down!"
- Danatbank's reaction:
  - No disclosure of information
  - Planned equity offering (with Danatbank as main buyer)
  - Danatbank "sought desperately to find means of supporting Nordwolle" (Feldman 1995)
  - Secretly buying own shares
- In June information became public

Data

- IPO and SEO prospectuses and bank annual reports (German Federal Archives)
- Daily stock market data for 87 firms (Berliner Boersen Zeitung)
- Period: 01.11.1930-04.06.1931 (15.138 firm-day observations)
- Other archival sources (letters, reports etc.)

Data description

	Danat firms	Other firms	Difference
	Manufacturing		
No .of firms	19	37	-18
% in group sample	57.58	68.52	-10.94
Median book value (Mio RM)	34.1	52.4	-18.3
	Mining		
No. of firms	6	10	-4
% in group sample	18.18	18.52	-0.34
Median book value (Mio RM)	83.8	56.1	27.7
	Utilities		
No. of firms	4	5	-1
% in group sample	12.12	9.26	2.86
Median book value (Mio RM)	44.2	79.3	-35.1
	Finance		
No. of firms	4	0	4
% in group sample	12.12	0	12.12
Median book value (Mio RM)	n.a.	n.a.	
	Geographical location		
No. of firms located in Berlin	9	13	-4
% in group sample	26	24	2

Market illiquidity

Frequency of supply order imbalances

	Before May 11	After May 11	Total
BHG	0.09	0.11	0.09
Commerz	0.13	0.13	0.13
Deu-Dis	0.10	0.15	0.10
Danat	0.06	0.23	0.08
Dresdner	0.10	0.16	0.11

Market illiquidity: Baseline results

$$Imbalance_{it} = \beta_1 \times Danat_i + \beta_2 \times May_p + \beta_3 \times (May_p \times Danat_i) + \alpha_i + \delta_t + \epsilon_{it}$$

|	(1)	(2)	(3)
May×$Danat$	0.158***	0.167***	0.181***
	(0.0438)	(0.0470)	(0.0507)
May×BHG		-0.0147	-0.0162
		(0.0319)	(0.0394)
May×$Commerz$		-0.00133	-0.0131
		(0.0423)	(0.0553)
May×$DeuDis$		0.0227	0.0300
		(0.0380)	(0.0386)
May×$Dresdner$		0.0342	0.0410
		(0.0449)	(0.0441)
Time FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Size			Yes
SizeMay			Yes
N	15138	15138	15138
R^2	0.128	0.128	0.130

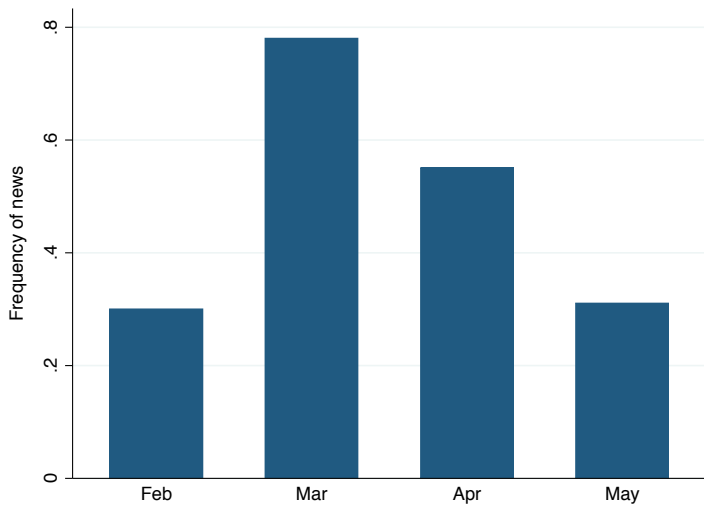# Market illiquidity: Placebo test
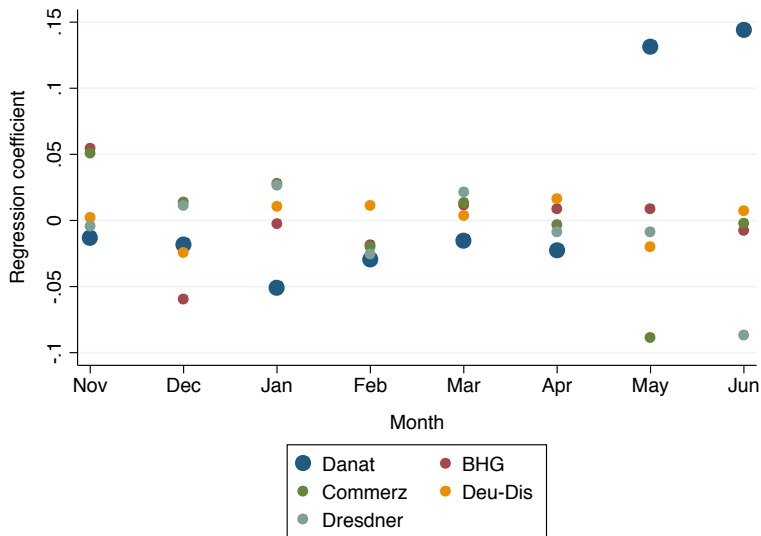
V-shaped price patterns
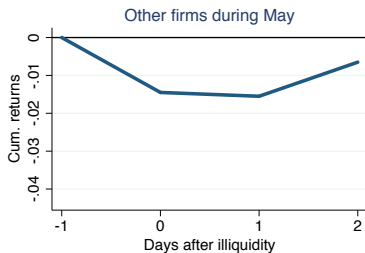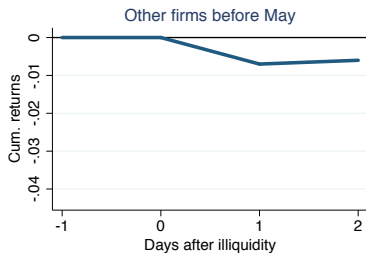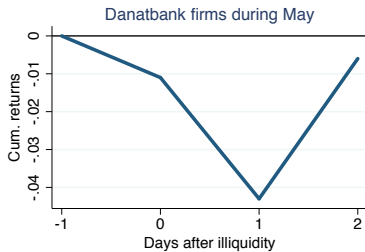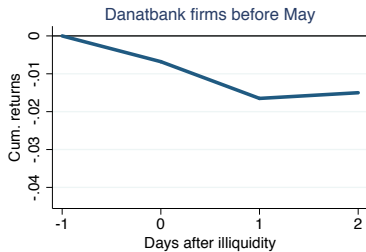
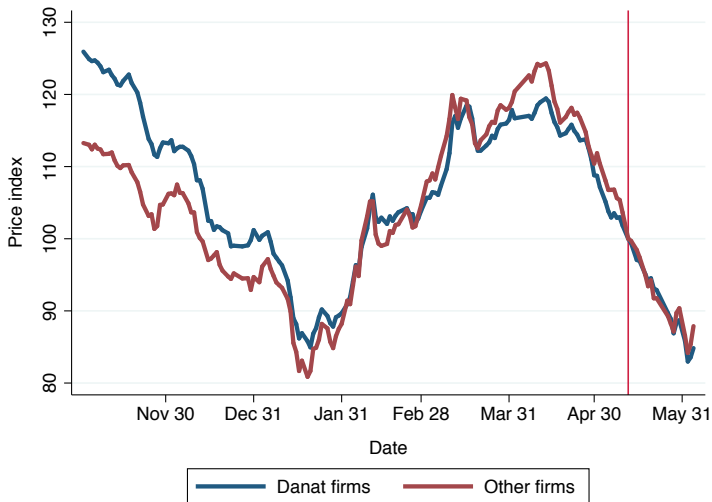# Investing in illiquidity: A contrarian trading strategy
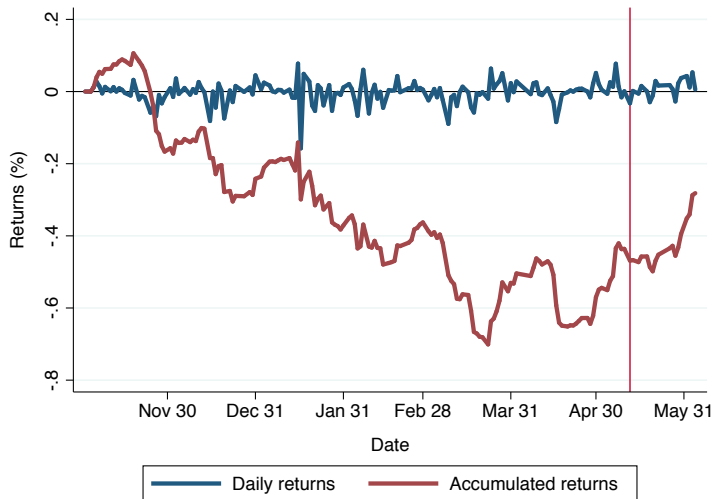
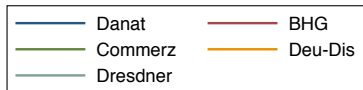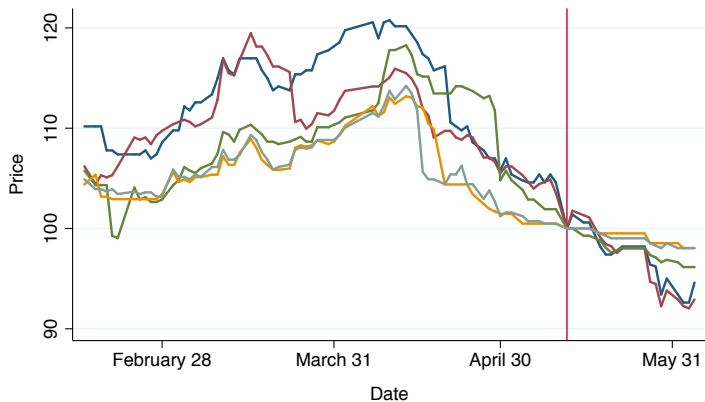# Investing in illiquidity: A contrarian trading strategy
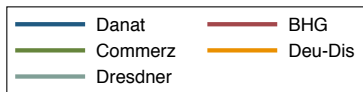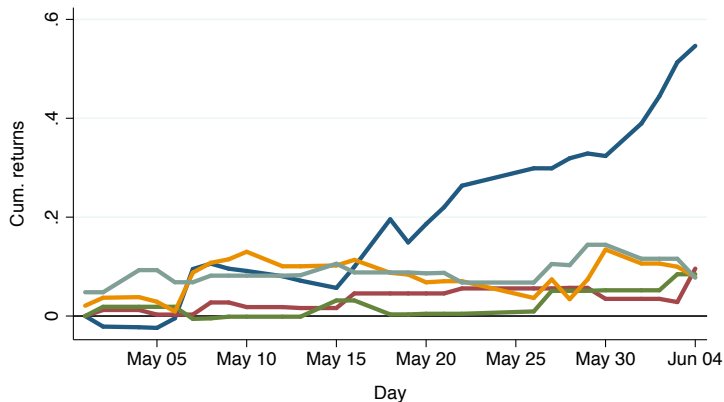
Robustness: Firm news

Stock prices

Robustness: Banks' stock prices

Conclusion

- Case study where balance sheet shock had asset pricing implications
- Unique setting:
  - Clear identification of liquidity provider
  - Large balance sheet shock
- V-shaped price patterns
- Discussion on universal banking: More prone to shocks

Market illiquidity: Logit results

$$Exc.supply_{it} = \beta_1 * Danat_i + \beta_2 * May_t + \beta_3 * (May_t * Danat_i) + \alpha_i + \delta_t + \epsilon_{it}$$

	(1) Logit	(2) Logit	(3) Logit
May*Danat	1.662***	1.887***	2.029***
	(0.327)	(0.472)	(0.494)
May*BHG		-0.269	-0.314
		(0.223)	(0.313)
May*Commerz		0.0581	0.0172
		(0.470)	(0.485)
May*DeuDis		0.472	0.501
		(0.443)	(0.466)
May*Dresdner		0.180	0.219
		(0.367)	(0.391)
Time FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Size			Yes
SizeMay			Yes
N	14616	14616	14616
Pseudo R^2	0.158	0.159	0.159

Volatility during May/June