Corporate Loan Spreads and Economic Activity

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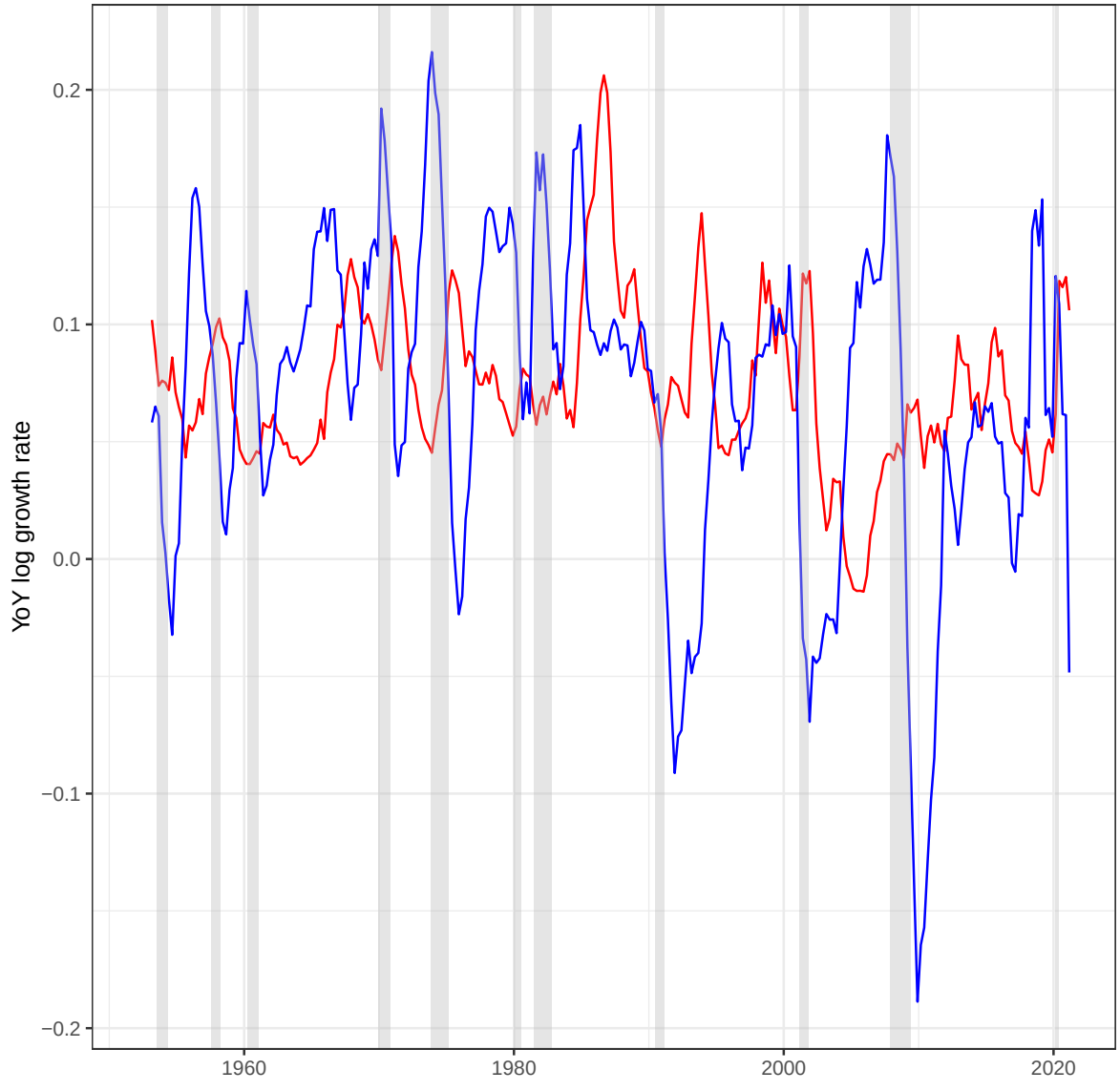
Motivation



Corporate bonds (red), Corporate loans (blue)

Motivation

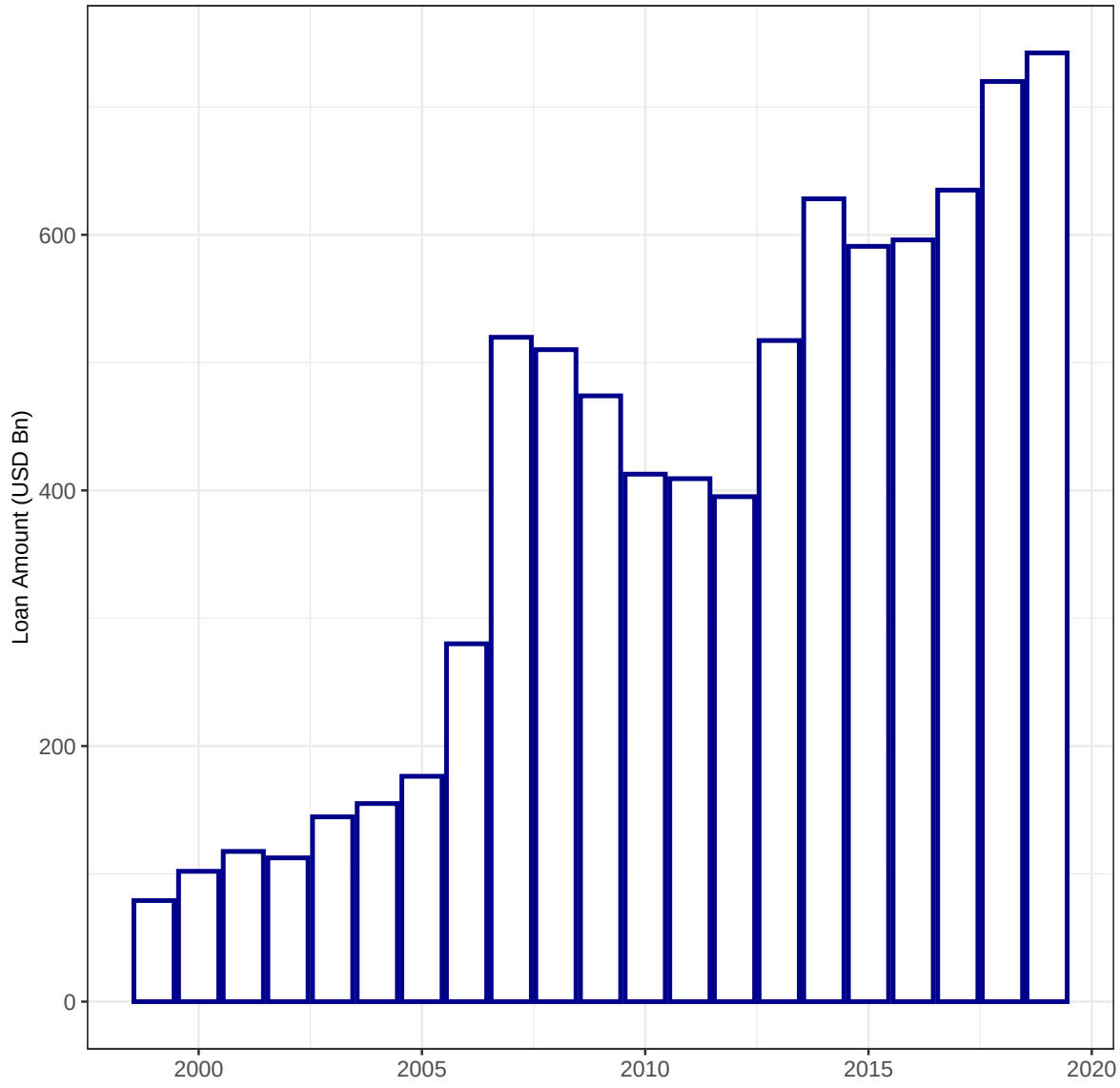
- Credit spreads derived from bond and loan markets encode useful information
  - Bond credit spreads capture the least constrained firms, misses firms most sensitive to financial frictions

→ This paper: Novel dataset to exploit the unique information contained within corporate *loan* spreads:
  - Improve economic forecasts
  - Measure financial frictions

Contribution

1. Introduce new credit spread that has economically large predictive power (beyond existing measures)
   - Important for academics and policy makers
2. Add to the debate on what types of frictions matter for the business cycle. Loan spreads capture both borrower and intermediary balance sheet constraints
   - Relax implicit assumption that the same frictions apply across bond and loan markets. Focusing only on bond market underestimates borrower frictions

SECONDARY LOAN MARKET TRADING VOLUME



Data

- Daily secondary market prices (mid quotes) of loans from the Loan Syndication and Trading Association (LSTA)
  - 1999 to Q1 2020 period, U.S. non-financial firms, TL, >300,000 loan-month observations ($\sim$ 1,200 loans outstanding per month)
- LPC Dealscan matched to LSTA using LIN
  - Loan amount/spread $->$ cash flows + contract terms
- Bond information
  - Gilchrist and Zakrajšek (2012), TRACE, and Mergent FISD
- Macro variables: FRED, BEA, BLS

▸ Loan Market - Liquidity

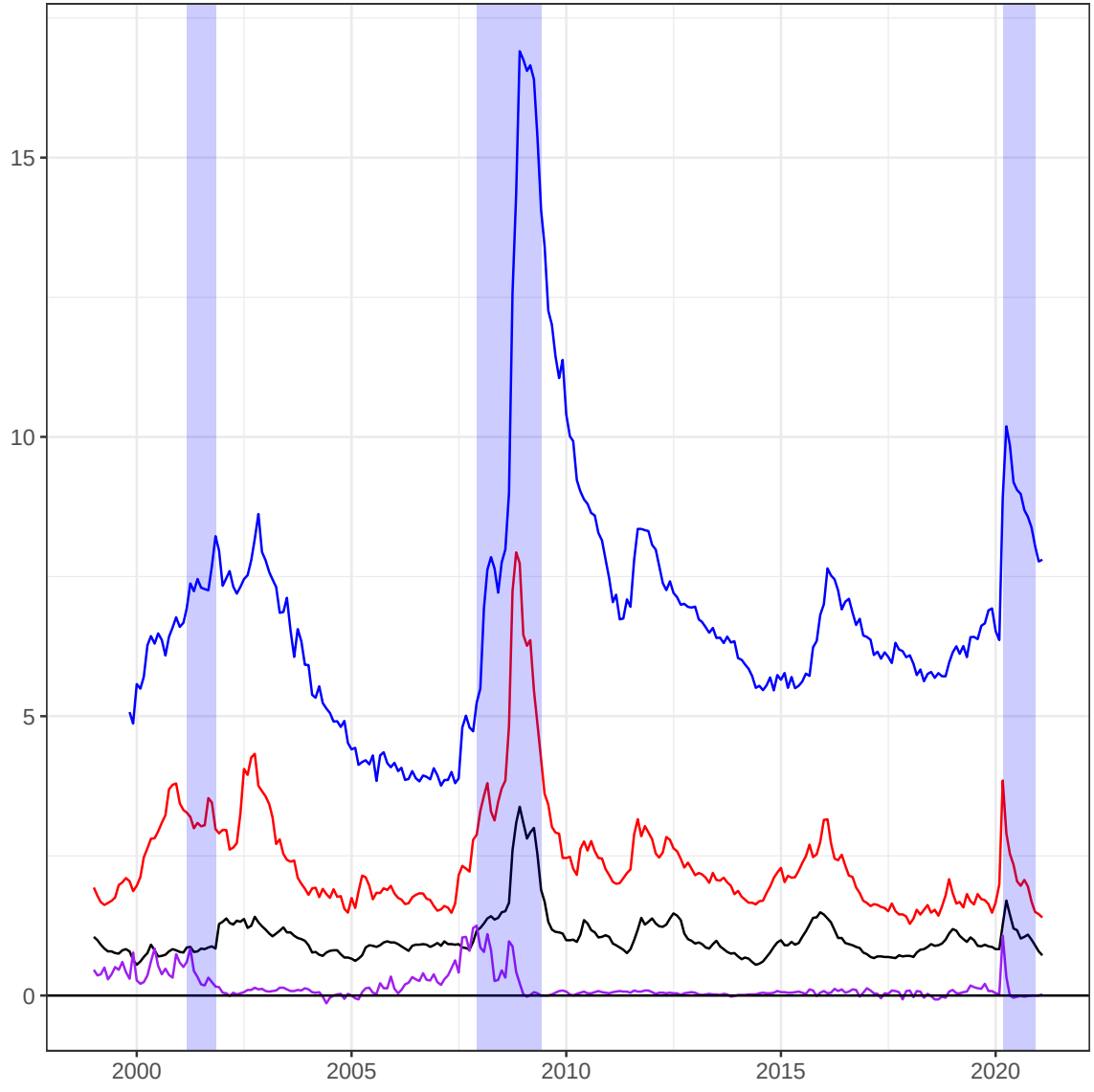
Aggregate loan spread

- "Bottom-up" spread
  - Qrt. cash flows: coupon using 3m forward LIBOR + AISD
    $\rightarrow$ yield-to-maturity $y_{it}[k]$
  - Synthetic risk-free loan w/ same cash-flow profile
    $\rightarrow$ yield-to-maturity $y^f_{it}[k]$
    - DCF using cont. comp. zero-coupon Treasury yields (Gürkaynak, Sack, and Wright, 2007)

$\rightarrow$ Loan spread (for each loan): $S_{it}[k] = y_{it}[k] - y^f_{it}[k]$

$\rightarrow$ Aggregate loan spread: $S^{Loan}_t = \frac{1}{N_t} \sum_i \sum_k S_{it}[k]$

Loan spread (1999-2020)



Loan spread (blue), GZ bond spread (red), Baa (black), CP-Bill (purple)

Forecasting economic developments

$$\Delta y_{t+h} = \alpha + \beta \Delta y_{t-1} + \gamma_1 \Delta S_t + \lambda_2 TS_t + \lambda_3 RFF_t + \epsilon_{t+h},$$

- Δy is the log growth rate of a macro variable (in this talk mainly industrial production. Various other measures in paper)
- S_t is a credit spread or other indicator
- TS_t is the term spread and RFF_t real effective fed fund rate
- Estimated with OLS, Newey-West/H-H s.e., coefficients are standardized

BASELINE RESULTS

	Industrial Production; Forecast horizon: 3 months							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta S_t^{CP\text{-}Bill}$		0.081						
		(0.919)						
$\Delta S_t^{Baa\text{-}Aaa}$			−0.276					
			(−3.860)					
$\Delta S_t^{HY\text{-}AAA}$				−0.252				
				(−3.520)				
ΔS_t^{Bond}					−0.207			
					(−2.650)			
ΔS_t^{Loan}						−0.405		−0.356
						(−5.600)		(−4.590)
$\Delta S_t^{Bond\ PC}$							−0.253	−0.115
							(−3.540)	(−1.690)
FFR	✓	✓	✓	✓	✓	✓	✓	✓
Term Spread	✓	✓	✓	✓	✓	✓	✓	✓
Adj R^2	0.189	0.192	0.262	0.249	0.228	0.335	0.249	0.343
Inc R^2	-	+0.03	+0.073	+0.060	+0.039	+0.146	+0.06	+0.154
LR Test(χ^2)	-	-	-	-	-	-	-	33.26
Obs	241	241	241	241	241	241	241	241

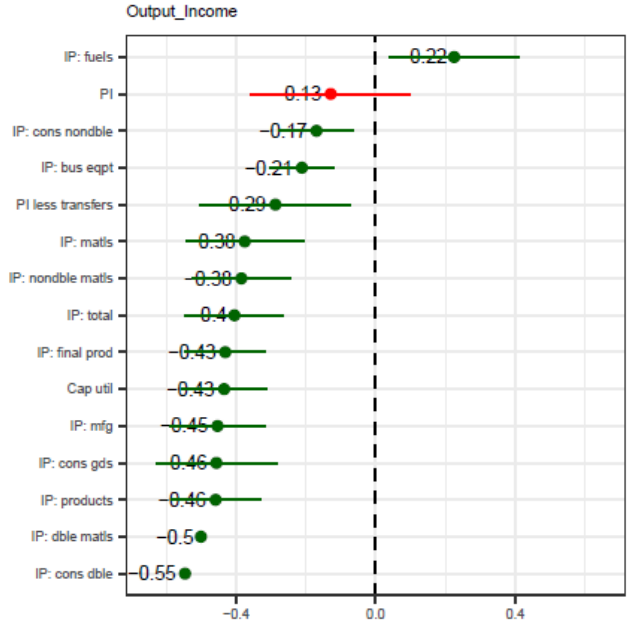
▸ Hansen Hodrick SE ▸ Europe ▸ OOS ▸ LP

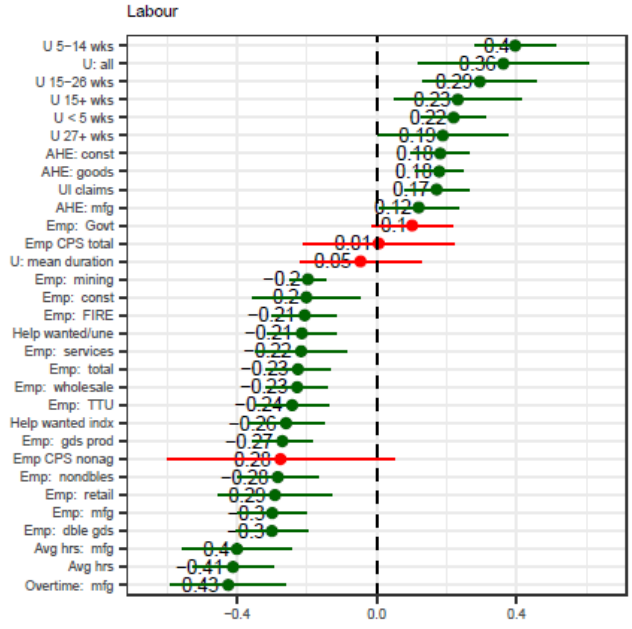
Alternative outcome variables

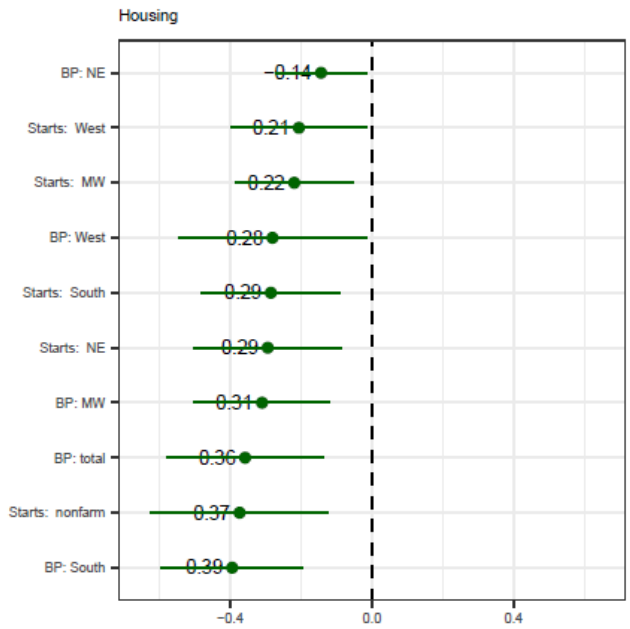
	Forecast horizon: 3 months					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
ΔS_t^{Loan}	-0.356 (-4.590)	-0.251 (-3.626)	0.356 (3.016)	-0.328 (-4.651)	-0.266 (-3.687)	-0.230 (-3.598)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.343	0.671	0.283	0.383	0.138	0.577
Incremental R^2	+0.154	+0.054	+0.125	+0.133	+0.071	+0.067
LR Test(χ^2)	33.26	35.14	33.01	30.21	15.98	23.68
Observations	241	241	241	241	241	241

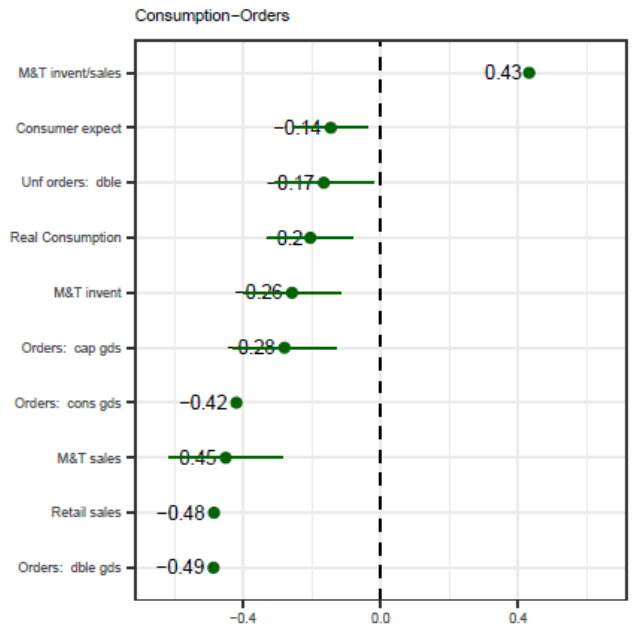
▸ Alternative timing - A ▸ Alternative timing - B

Alternative outcome variables - Loan Spread









Dynamics - Local Projections

ROBUSTNESS - "KITCHEN-SINK"

	Forecast horizon: 3 months					
	(1) IP	(2) PEMP	(3) UE	(4) TCU	(5) NEW	(6) INV
ΔS_t^{Loan}	-0.271 (-4.375)	-0.164 (-3.500)	0.150 (2.955)	-0.237 (-4.269)	-0.236 (-4.180)	-0.137 (-2.299)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
ΔS_t^{Bond}	✓	✓	✓	✓	✓	✓
Bid-Ask	✓	✓	✓	✓	✓	✓
SP500Ret	✓	✓	✓	✓	✓	✓
VIX	✓	✓	✓	✓	✓	✓
Observations	241	241	241	241	241	241

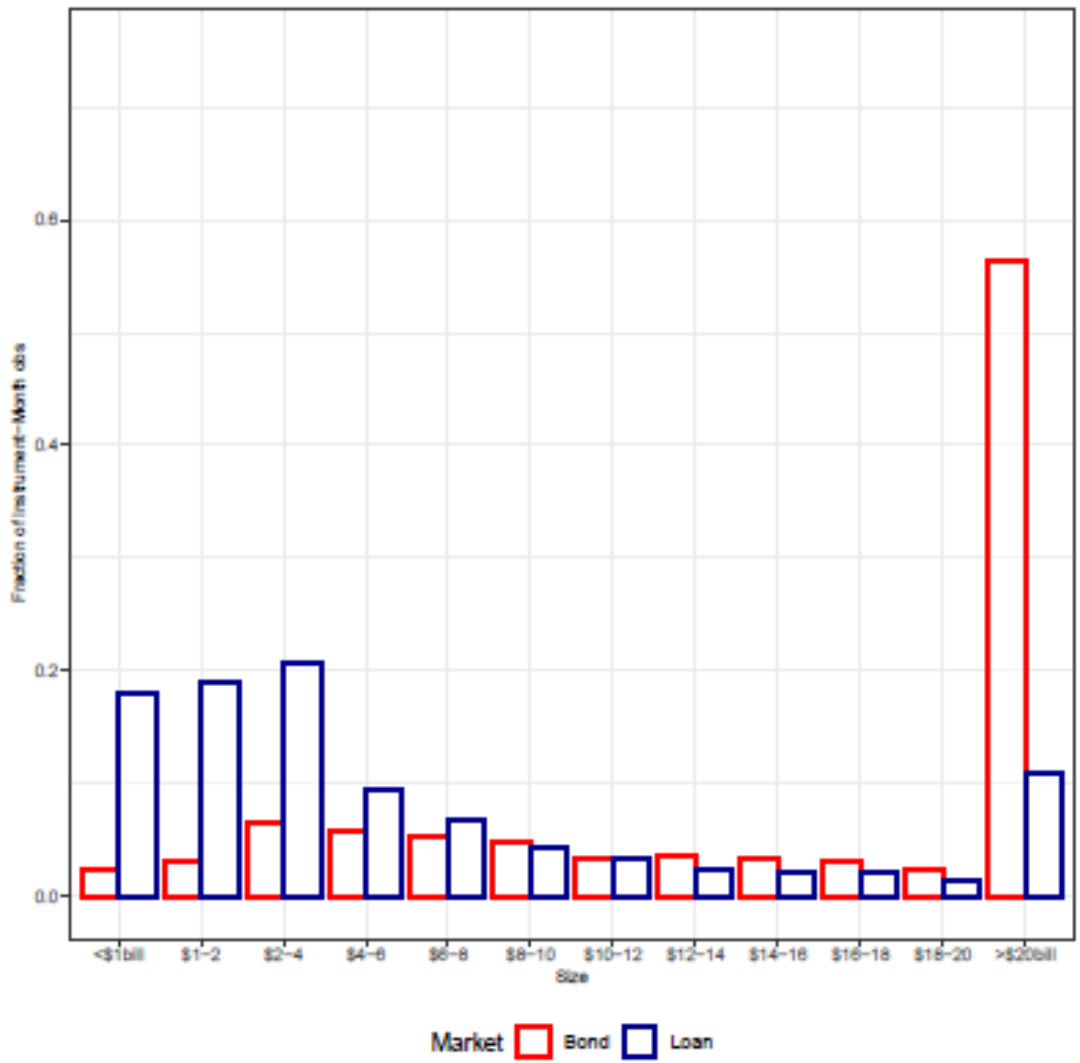
Summary of mechanisms

- What explains the *relative* predicitive power of the loan spread vs other credit spread?
- 4 groups of explanations:
  - **No Frictions:** Prices contain forward looking information about firm fundamentals
  - **Frictions:** Exposure to financial frictions (borrowers/intermediaries)
  - **Investor Demand:** Differential investor demand in loan vs bond markets
  - **Behavioural:** Exposure to behavioural biases

Mechanism I: No Frictions

- While all financial asset prices should reflect investors' expectations, credit markets might be particularly informative about fundamentals (e.g. Philippon, 2009)
- However, for this channel to explain the *relative* predictive power of loan spreads one of the following must be true:
  - Loan markets reflect fundamental information more accurately compared to bond markets
  - There is additional fundamental information reflected in loan markets

Size effect – size differences



- Plausible, but not the whole story...

Mechanism II: Frictions

- Loan markets are populated with firms that may have limited access to alternative funding sources
- Loan market borrowers may be particularly sensitive to shocks to the balance sheets of **financial intermediaries** or financial frictions that emanate from their **own balance sheet**
- (Holmström and Tirole, 1997) both shocks to aggregate firm capital and intermediary capital will particularly affect low net worth firms.

Mechanism II: Frictions

	Forecast horizon: h = 3m					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Private firms:						
ΔS_t^{Loan} Private	-0.367	-0.232	0.359	-0.346	-0.272	-0.235
	(-5.016)	(-3.318)	(3.300)	(-5.342)	(-3.980)	(-4.011)
Adjusted R^2	0.355	0.666	0.290	0.397	0.144	0.581
Incremental R^2	+0.166	+0.048	+0.132	+0.147	+0.078	+0.071
Panel B. Public firms:						
ΔS_t^{Loan} Small/Young	-0.324	-0.188	0.271	-0.289	-0.261	-0.223
	(-3.449)	(-2.072)	(1.882)	(-3.270)	(-2.987)	(-2.997)
Adjusted R^2	0.330	0.649	0.239	0.367	0.136	0.575
Incremental R^2	+0.141	+0.031	+0.080	+0.117	+0.070	+0.065
ΔS_t^{Loan} Large/Old	-0.189	-0.148	0.187	-0.161	-0.219	-0.155
	(-2.667)	(-2.004)	(1.483)	(-2.418)	(-3.048)	(-2.098)
Adjusted R^2	0.274	0.637	0.206	0.321	0.118	0.553
Incremental R^2	+ 0.085	+0.020	+0.048	+0.071	+0.051	+0.043

- Loan spreads of *financially constrained* firms have higher predictive power.
  - Private firms, small & young firms

Mechanism II: Frictions

Panel C. Public firms not active in the bond market:						
ΔS_t^{Loan} Small/Young	-0.327	-0.192	0.278	-0.292	-0.271	-0.223
	(-3.665)	(-2.132)	(1.931)	(-3.482)	(-3.186)	(-3.232)
Adjusted R^2	0.333	0.651	0.243	0.370	0.142	0.576
Incremental R^2	+0.144	+0.033	+0.085	+0.120	+0.075	+0.066
ΔS_t^{Loan} Large/Old	-0.181	-0.148	0.178	-0.157	-0.188	-0.145
	(-3.337)	(-2.184)	(1.521)	(-3.021)	(-3.032)	(-1.996)
Adjusted R^2	0.272	0.638	0.204	0.320	0.108	0.551
Incremental R^2	+0.083	+0.020	+0.045	+0.070	+0.042	+0.041
Controls in Panels A-C:						
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Observations	241	241	241	241	241	241

- Even within the set of no-bond firms, a loan spread constructed using young and small firms still has significantly more predictive power

Mechanism II: Frictions

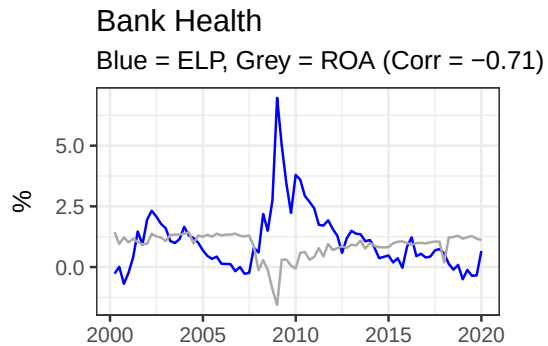
	Forecast horizon: h = 3m						
Panel A.	IP	IP	IP	IP	IP	IP	IP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔS_t^{Loan}	-0.405				-0.445		
	(-5.600)				(-4.112)		
ΔS_t^{Loan} Small/Young						-0.375	-0.406
						(-4.115)	(-3.400)
ΔS_t^{Bond}		-0.207					
		(-2.650)					
ΔS_t^{Bond} Small/Young			-0.244		0.014		-0.018
			(-2.490)		(0.138)		(-0.184)
ΔS_t^{Bond} Large/Old				-0.215			
				(-2.582)			
Term Spread	✓	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.335	0.228	0.229	0.216	0.337	0.320	0.330
Incremental R^2	+0.146	+0.039	+0.040	+0.027	+0.148	+0.131	+0.141
Observations	241	241	209	209	209	241	209

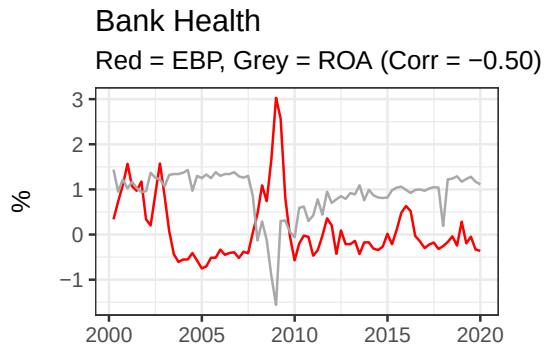
- It is the set of borrowers without bond market access that explains the largest part of the additional predictive power of the loan spread.
  - A no-friction explanation appears unlikely!!
- *Type* of frictions?

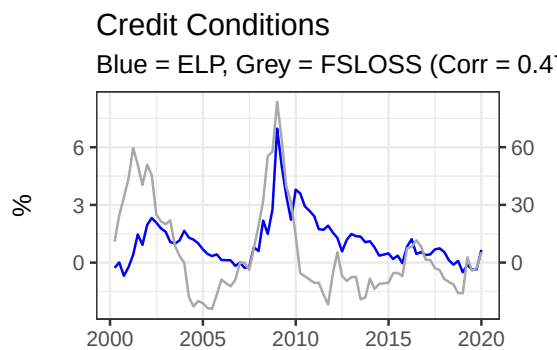
Mechanism II: Type of Frictions

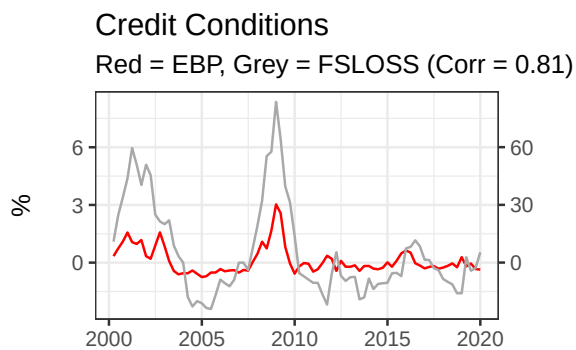
- Loan market borrowers may have limited funding alternatives and hence are particularly sensitive to shocks to the balance sheets of financial intermediaries
- Reduced capacity and/or willingness of intermediaries to provide credit to the economy which is reflected in credit spreads
  - A deterioration in the health of intermediaries (e.g. Holmström and Tirole, 1997)
  - Frictions in raising new capital (e.g. He and Krishnamurthy, 2013; Gertler and Kiyotaki, 2010)
  - Fluctuations in collateral value (e.g. Kiyotaki and Moore, 1997)
- Approach: Decompose loan spread into i) "predicted spread" and ii) "Excess loan premium" (ELP) (Gilchrist and Zakrajšek, 2012)

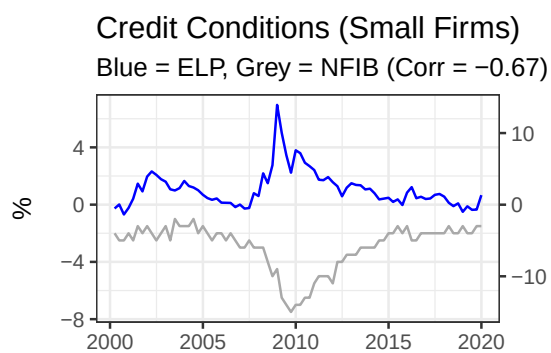
Mechanism II: Type of Frictions

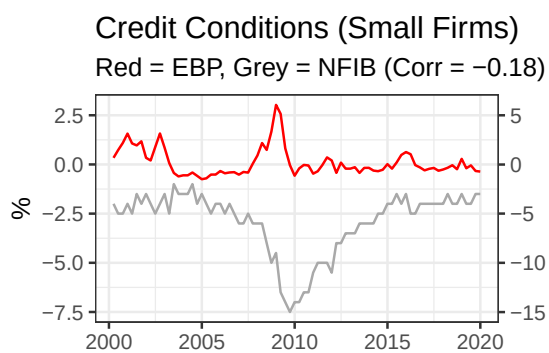












ELP is more correlated with bank ROA and credit conditions of small firms.

Mechanism II: Type of Frictions

	Forecast horizon: h = 3 month					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A.						
ΔELP_t	-0.265	-0.194	0.218	-0.236	-0.240	-0.187
	(-4.682)	(-3.784)	(2.392)	(-4.516)	(-3.869)	(-2.876)
$\Delta \hat{S}_t^{Loan}$	-0.373	-0.150	0.345	-0.361	-0.179	-0.205
	(-5.009)	(-3.043)	(3.324)	(-5.324)	(-2.197)	(-3.576)
Adjusted R^2	0.355	0.668	0.302	0.397	0.140	0.576
Incremental R^2	+0.166	+0.051	+0.144	+0.147	+0.074	+0.066
Observations	241	241	241	241	241	241
Panel B.						
ΔEBP_t	-0.179	-0.071	0.114	-0.166	-0.108	-0.117
	(-2.463)	(-1.081)	(0.734)	(-2.452)	(-1.113)	(-1.161)
$\Delta \hat{S}_t^{Bond}$	-0.197	-0.046	0.102	-0.187	-0.127	-0.137
	(-2.289)	(-0.674)	(0.708)	(-2.363)	(-1.224)	(-1.580)
Adjusted R^2	0.226	0.619	0.166	0.283	0.076	0.526
Incremental R^2	+0.038	+0.001	+0.007	+0.033	+0.001	+0.016
Observations	241	241	241	241	241	241
Controls in Panels A-B:						
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓

- The forecasting power of ELP and predicted loan spread are larger compared to bond spread components.
  - Borrower balance-sheets appear important in understanding forecasting power (either fundamental risk or financial constraints).

Mechanism II: Type of Frictions

	Forecast horizon: h = 3 month					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Small and young firms						
ΔELP_t	-0.267	-0.156	0.199	-0.227	-0.272	-0.174
	(-3.443)	(-2.220)	(1.703)	(-3.142)	(-3.067)	(-2.271)
$\Delta \hat{S}_t^{Loan}$	-0.303	-0.165	0.320	-0.298	-0.191	-0.144
	(-2.366)	(-1.754)	(1.924)	(-2.507)	(-2.003)	(-2.130)
Adjusted R^2	0.348	0.654	0.264	0.385	0.160	0.569
Incremental R^2	+0.159	+0.036	+0.106	+0.135	+0.093	+0.059
Observations	241	241	241	241	241	241
Panel B. Large and old firms						
ΔELP_t	-0.079	-0.098	0.070	-0.058	-0.168	-0.108
	(-1.588)	(-1.865)	(0.696)	(-1.272)	(-2.904)	(-1.671)
$\Delta \hat{S}_t^{Loan}$	-0.227	-0.109	0.254	-0.234	-0.063	-0.072
	(-1.572)	(-1.199)	(1.464)	(-1.715)	(-0.577)	(-0.923)
Adjusted R^2	0.280	0.634	0.218	0.334	0.104	0.545
Incremental R^2	+0.091	+0.017	+0.060	+0.084	+0.038	+0.035
Observations	241	241	241	241	241	241
Controls in Panels A-B:						
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓

- Key result: *Supply-side frictions* of banks adversely impact availability of credit for specifically small & young firms.

Mechanism III: Investor Demand

- Investor demand can be an important factor in explaining asset price dynamics (see, e.g., Koijen and Yogo, 2019),
  - Loan and bond prices might contain information about shocks to investors rather than to borrowers or dealer banks.

- Changes in investor demand can affect funding conditions for firms and thus have real effects, i.e., can be informative about economic developments (see, among others, Ben-Rephael, Choi, and Goldstein, 2020; Kubitza, 2021).

Mechanism III: Investor Demand

	Forecast horizon: h = 3m					
Panel A.	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
ΔS_t^{Loan}	-0.347	-0.240	0.333	-0.319	-0.264	-0.222
	(-4.609)	(-3.463)	(2.889)	(-4.559)	(-3.860)	(-3.594)
CLO Primary Issuance$_t$	0.225	0.101	-0.284	0.237	0.070	0.117
	(2.358)	(1.973)	(-3.242)	(2.558)	(0.588)	(1.820)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.371	0.689	0.341	0.401	0.131	0.601
Incremental R^2	+0.182	+0.072	+0.183	+0.151	+0.065	+0.090
Observations	228	228	228	228	228	228
Panel B.						
ΔS_t^{Loan}	-0.331	-0.234	0.318	-0.309	-0.246	-0.294
	(-4.621)	(-3.060)	(2.496)	(-4.609)	(-4.151)	(-4.234)
Time on Market$_t$	-0.259	-0.157	0.342	-0.270	-0.087	-0.023
	(-2.599)	(-2.779)	(3.783)	(-2.745)	(-0.915)	(-0.365)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.387	0.653	0.351	0.414	0.151	0.550
Incremental R^2	+0.198	+0.035	+0.193	+0.164	+0.085	+0.039
Observations	213	213	213	213	213	213

- Are loan markets more susceptible to behavioural biases?

Mechanism IV: Behavioural

- Finally, there is a literature that highlights the role of extrapolative beliefs (see, e.g., Bordalo, Gennaioli, and Shleifer, 2018; Greenwood and Hanson, 2013; López-Salido, Stein, and Zakrajšek, 2017)
- Expectations about future economic development are overly influenced by the current state of the economy, investors become overly optimistic in response to positive news. This leads to narrower credit spreads and an (over-) extension of credit followed by a mean reversion in sentiment.

▸ HY Loan/Bond

Summary of mechanisms

- Evidence consistent with the *joint* role of borrower and intermediary constraints (Rampini and Viswanathan (2019)).
- Other potential channels explored in the literature:
  - Uncertainty drives borrower demand for credit (e.g. Baker, Bloom, and Davis (2016) , Pflueger, Siriwardane, and Sunderam (2020))
    ▸ Uncertainty
  - Investor sentiment might shape economic outcomes (Greenwood and Hanson (2013)), López-Salido, Stein, and Zakrajšek (2017))
    ▸ Sentiment

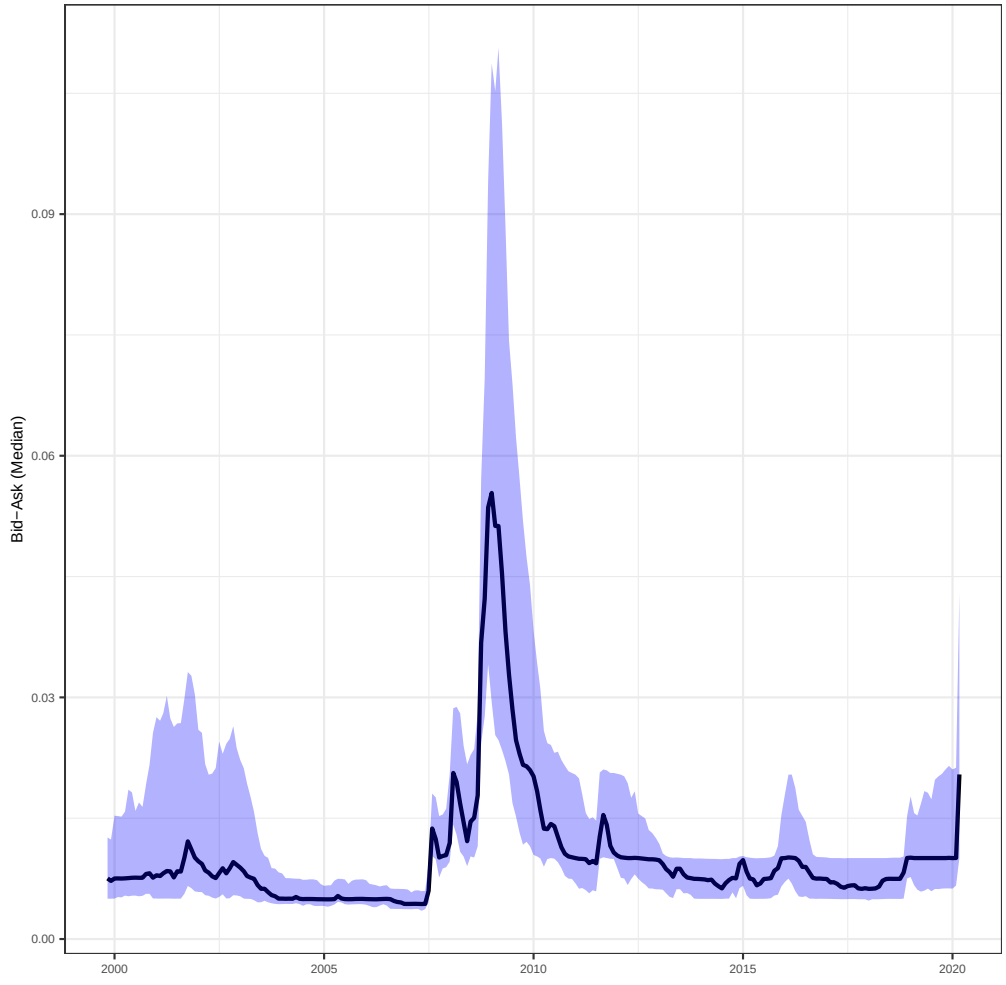
▸ Size Effect Literature

Conclusion

- Introduce a novel measure of credit spreads using secondary loan market prices
- Loan spreads contain information about the future business cycle above and beyond existing credit spread indicators
- Differential predictive power is (in part) driven by compositional differences btw loan and bond markets (captures both borrower and bank frictions)

Thanks!

Secondary loan market liquidity



- Pre-GFC bid-ask-spread: 68bps (vs. 34bps in the bond market)
- Secondary loan market is highly liquid.

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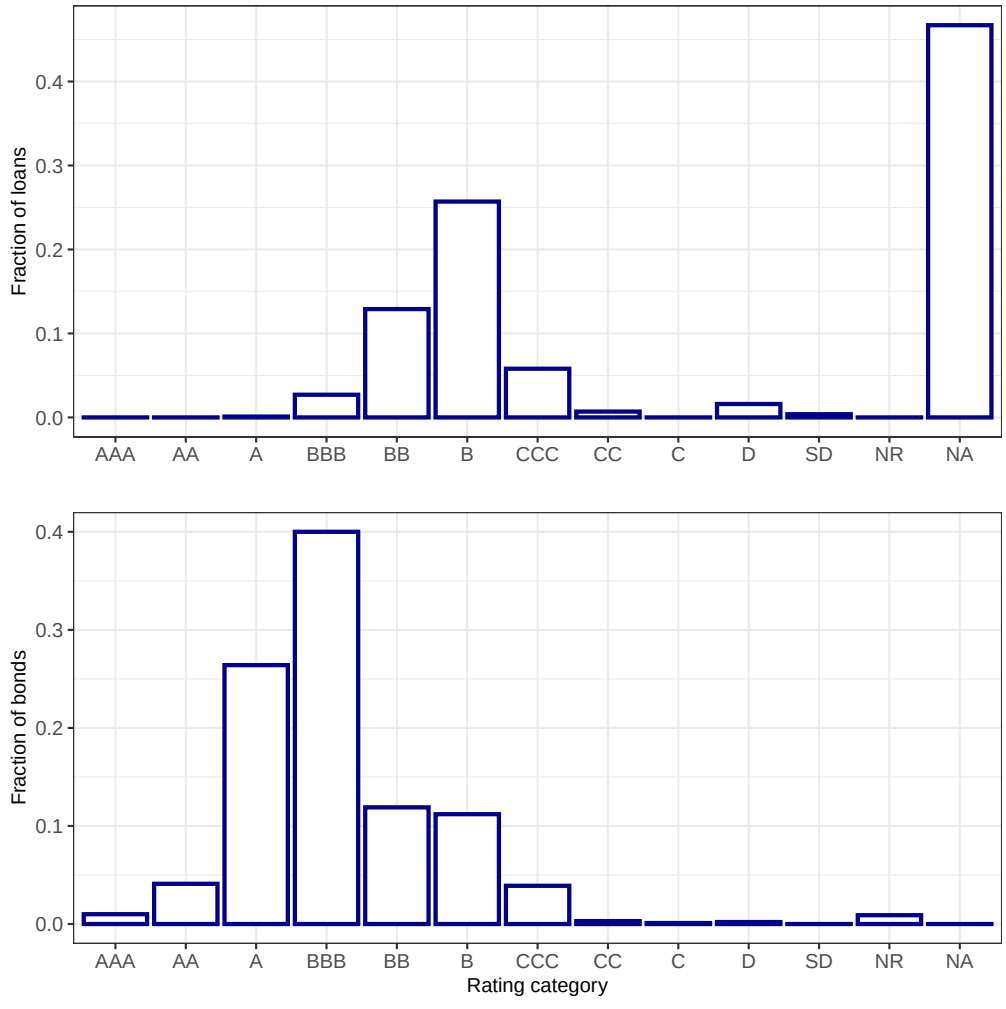
RATING DISTRIBUTION – BOND VS LOAN MARKET



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Alternative standard errrors

	Forecast horizon: 3 months					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
ΔS_t^{Loan}	-0.405 (-6.761)	-0.239 (-3.633)	0.362 (2.725)	-0.376 (-6.634)	-0.280 (-3.223)	-0.259 (-3.423)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.335	0.672	0.286	0.375	0.140	0.575
Observations	241	241	241	241	241	241

- Results remain highly significant with Hansen-Hodrick standard errors.

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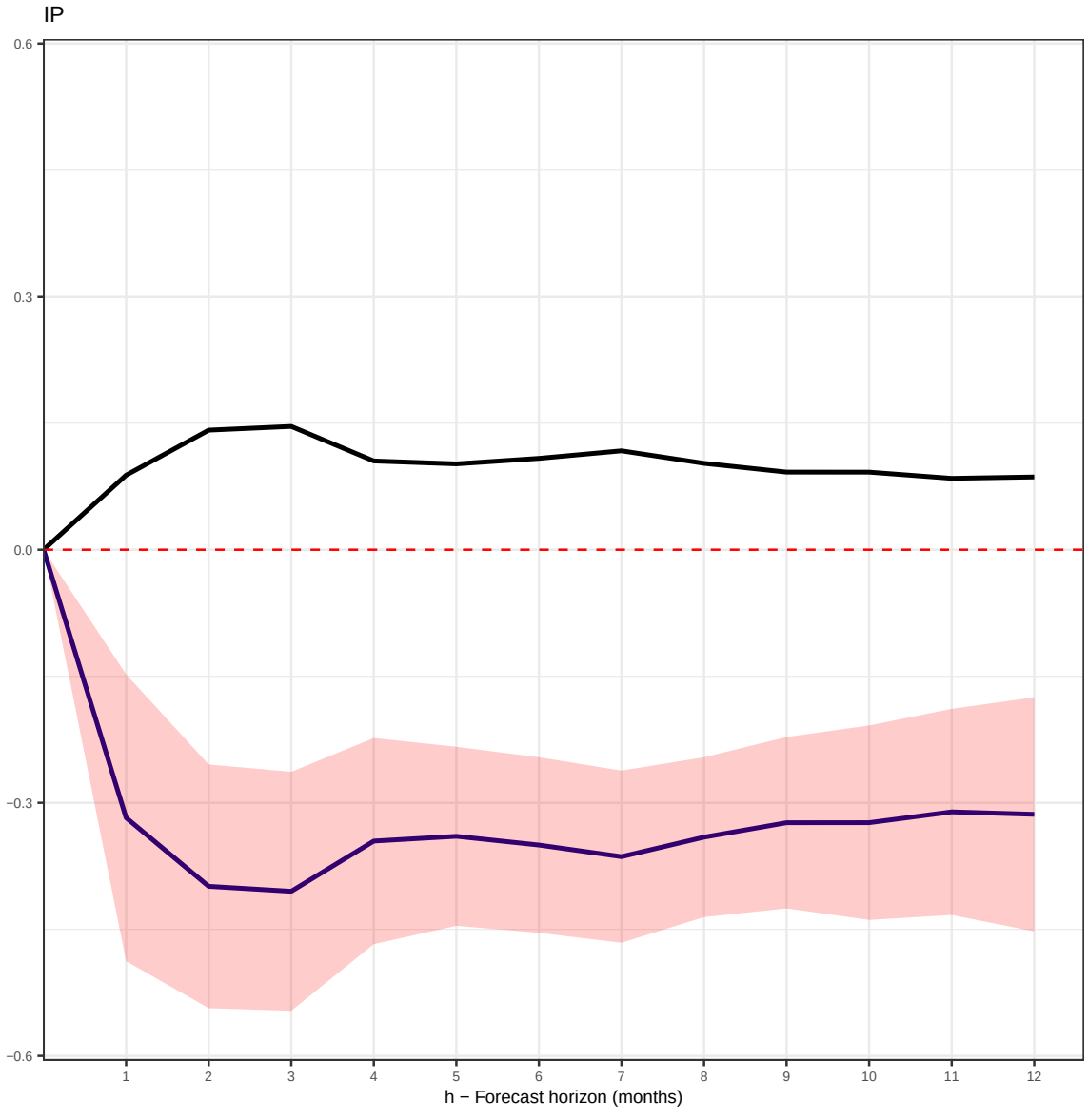
Evidence from Europe

	MAN	MAN	MAN	MAN	MAN	UE
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Germany						
ΔS_t^{HYBond}		-0.280				
		(-1.861)				
ΔS_t^{Bond}			-0.187			
			(-1.659)			
ΔS_t^{Loan}				-0.379	-0.316	0.153
				(-2.455)	(-2.423)	(2.470)
$\Delta S_t^{Bond\ PC}$					-0.128	0.0004
					(-1.802)	(0.006)
Adjusted R^2	0.141	0.207	0.171	0.263	0.271	0.415
Incremental R^2	-	+0.065	+0.029	+0.122	+0.129	+0.016
Contribution from ΔS_t^{Loan}	-	-	-	-	0.704	0.890
Observations	227	227	227	227	227	227

▸ France ▸ Spain ▸ Spreads plot ▸ Back

Dynamics - Local Projections



▸ Other variables ▸ Back

Alternative timing conventions

	Forecast horizon: 3 months					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
ΔS_t^{Loan}	-0.309 (-4.841)	-0.146 (-3.867)	0.325 (3.123)	-0.287 (-4.773)	-0.226 (-3.777)	-0.117 (-2.057)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.361	0.850	0.240	0.414	0.160	0.566
Incremental R^2	+0.216	+0.026	+0.102	+0.191	+0.056	+0.023
LR Test(χ^2)	72.1	41.3	32.6	70.2	17.6	14.7
Observations	241	241	241	241	241	241

- Defines growth rate as the growth from t to $t+3$

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Alternative timing conventions

	Forecast horizon: 3 months					
	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
ΔS_t^{Loan}	-0.252 (-3.597)	-0.190 (-4.839)	0.267 (3.728)	-0.228 (-3.538)	-0.243 (-3.918)	-0.201 (-3.931)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.452	0.862	0.389	0.505	0.123	0.604
Incremental R^2	+0.132	+0.045	+0.082	+0.113	+0.069	+0.063
LR Test(χ^2)	54.1	71.4	32.4	52.0	19.8	37.9
Observations	241	241	241	241	241	241

- Defines growth rate as the growth from t to $t+3$ and lag period as $t-3$ to t

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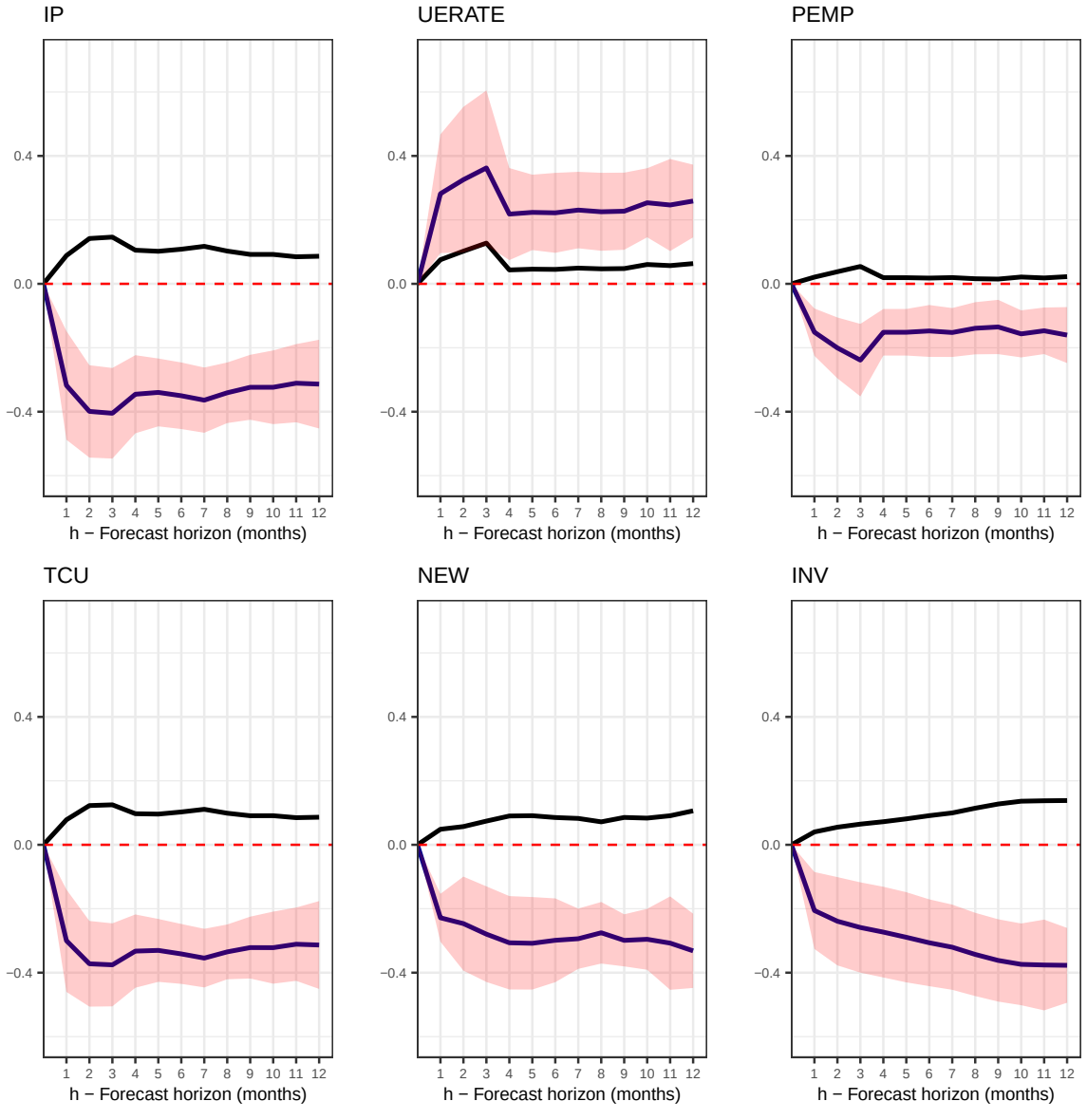
Dynamics - Local Projections



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Out-of-sample

	OOS horizon: h = 3 month		
	RMSE	Normalized RMSE	$T-stat(p-value)$
	(1)	(2)	(3)
Panel A. IP			
Baseline	0.0125	0.7033	-
Baseline + $\Delta S_t^{Bond\ PC}$	0.0125	0.7027	-
Baseline + ΔS_t^{Loan}	0.0113	0.6359	$-2.836(0.005)$

- RMSE calculated via cross validation with expanding rolling window
- Loan spread significantly better at OOS forecasting

▸ Back ▸ Other variables

Out-of-sample

	OOS horizon: h = 3 month		
	RMSE	Normalized RMSE	$T-stat(p-value)$
	(1)	(2)	(3)
Panel A. IP			
Baseline + $\Delta S_t^{Bond\ PC}$	0.0125	0.7027	-
Baseline + ΔS_t^{Loan}	0.0113	0.6359	$-2.836(0.005)$
Panel B. PEMP			
Baseline + $\Delta S_t^{Bond\ PC}$	0.00328	0.4843	-
Baseline + ΔS_t^{Loan}	0.00315	0.4660	$-1.115(0.266)$
Panel C. UE			
Baseline + $\Delta S_t^{Bond\ PC}$	0.3182	0.7528	-
Baseline +ΔS_t^{Loan}	0.3014	0.7130	$-1.583(0.115)$
Panel D. TCU			
Baseline + $\Delta S_t^{Bond\ PC}$	0.9775	0.6823	-
Baseline + ΔS_t^{Loan}	0.9009	0.6289	$-2.482(0.014)$
Panel E. NEW			
Baseline + $\Delta S_t^{Bond\ PC}$	0.1031	0.7839	-
Baseline +ΔS_t^{Loan}	0.0985	0.7493	$-1.733(0.085)$
Panel F. INV			
Baseline + $\Delta S_t^{Bond\ PC}$	0.0097	0.5142	-
Baseline +ΔS_t^{Loan}	0.0092	0.4838	$-1.652(0.100)$

Back

Evidence from Europe

	MAN	MAN	MAN	MAN	MAN	UE
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B. France						
ΔS_t^{HYBond}		-0.241				
		(-1.661)				
ΔS_t^{Bond}			-0.138			
			(-0.937)			
ΔS_t^{Loan}				-0.338	-0.289	0.263
				(-2.167)	(-2.170)	(2.232)
$\Delta S_t^{Bond\ PC}$					-0.102	0.065
					(-1.080)	(0.727)
Adjusted R^2	0.097	0.143	0.110	0.192	0.195	0.217
Incremental R^2	-	+0.046	+0.013	+0.095	+0.098	+0.070
Contribution from ΔS_t^{Loan}	-	-	-	-	0.730	0.775
Observations	188	188	188	188	188	188

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Evidence from Europe

	MAN	MAN	MAN	MAN	MAN	UE
	(1)	(2)	(3)	(4)	(5)	(6)
Panel C. Spain						
ΔS_t^{HYBond}		-0.292				
		(-1.935)				
ΔS_t^{Bond}			-0.188			
			(-1.184)			
ΔS_t^{Loan}				-0.238	-0.122	0.103
				(-1.972)	(-1.145)	(2.268)
$\Delta S_t^{Bond\ PC}$					-0.224	0.085
					(-1.398)	(1.173)
Adjusted R^2	0.132	0.180	0.153	0.180	0.207	0.712
Incremental R^2	-	+0.069	+0.030	+0.048	+0.075	+0.021
Contribution from ΔS_t^{Loan}	-	-	-	-	0.371	0.553
Observations	187	187	187	187	187	187

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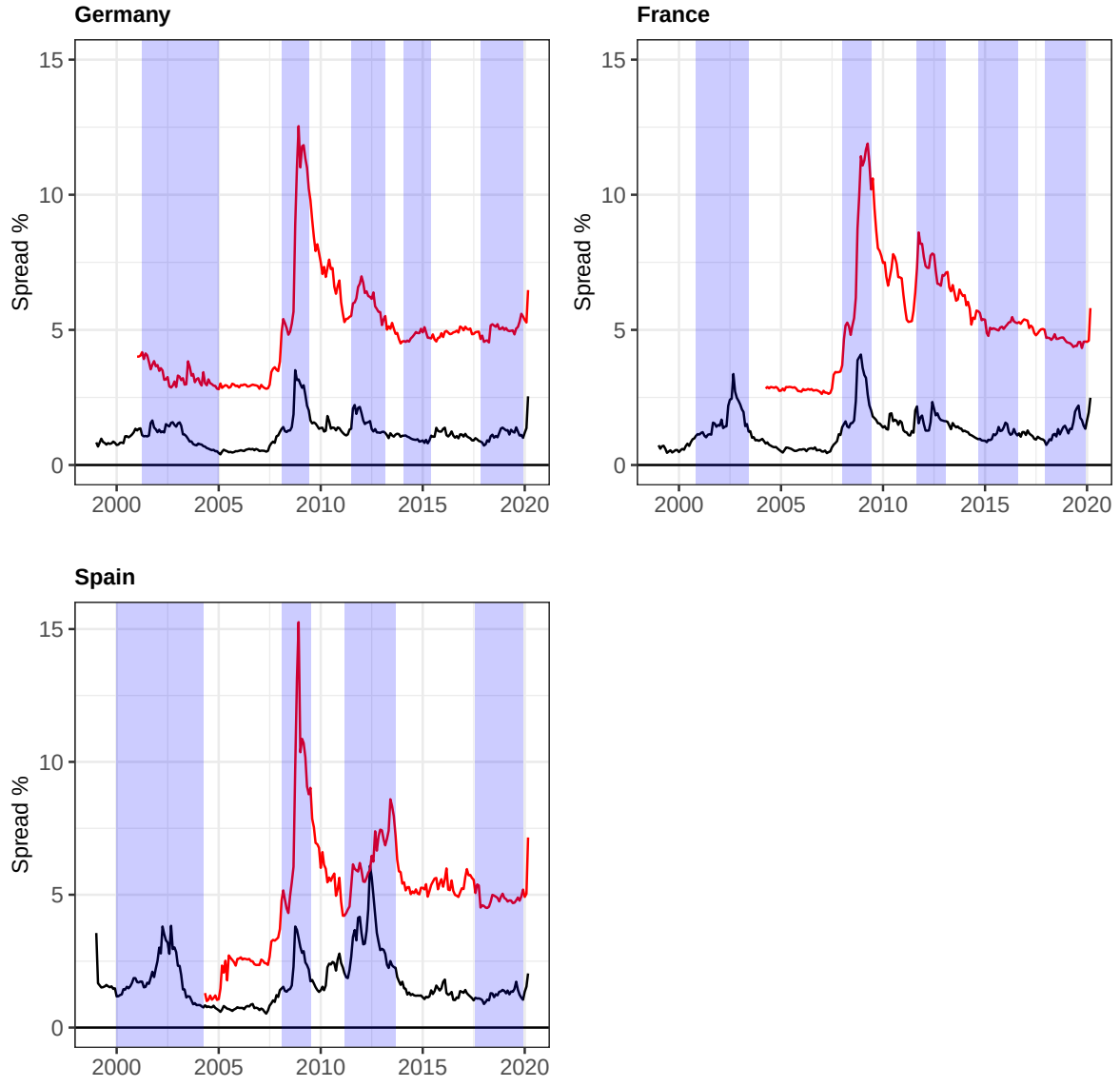
Evidence from Europe



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Credit conditions – Europe

	Credit conditions based on loan officer surveys	
	(1)	(2)
Germany		
ΔS_t^{Loan}	0.376	
	(3.748)	
ΔS_t^{Bond}		0.159
		(1.182)
Adjusted R^2	0.128	0.011
Observations	70	70
France		
ΔS_t^{Loan}	0.480	
	(3.545)	
ΔS_t^{Bond}		0.329
		(1.436)
Adjusted R^2	0.218	0.094
Observations	64	64
Spain		
ΔS_t^{Loan}	0.370	
	(2.018)	
ΔS_t^{Bond}		0.176
		(1.008)
Adjusted R^2	0.122	0.015
Observations	63	63

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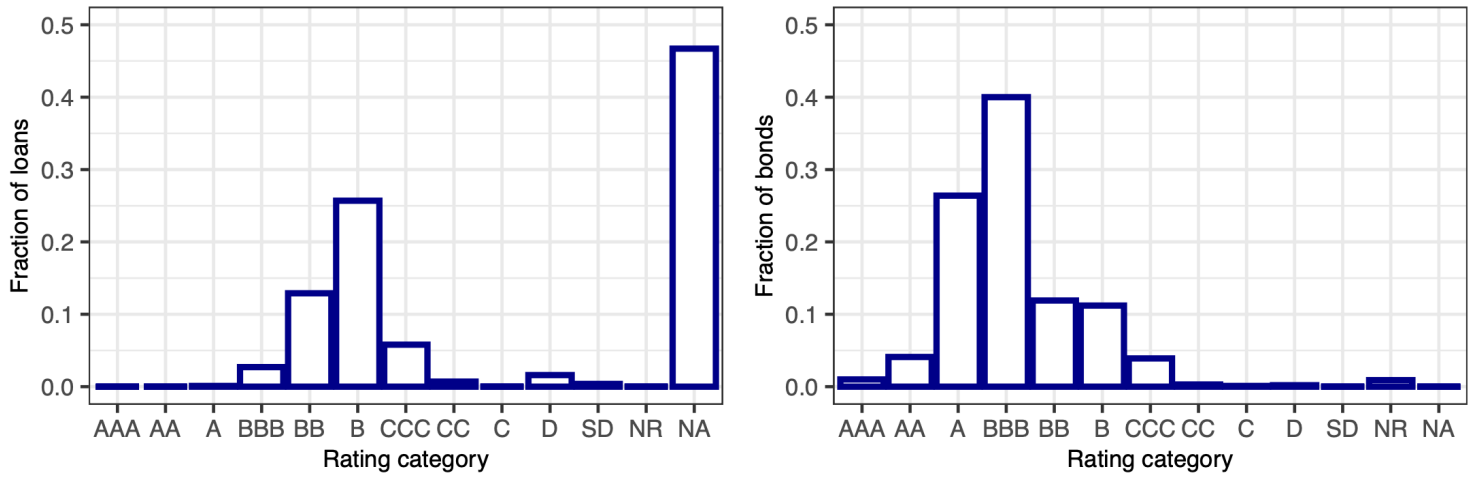
Borrower Rating



- Half of loan market borrowers are private/unrated firms. Limited overlap between bond and loan borrowers

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Borrower Rating

	Industrial production; Forecast horizon: 3 months			
	(1)	(2)	(3)	(4)
ΔS_t^{Loan}[BBB]	−0.101			
	(−1.532)			
ΔS_t^{Loan}[BB]		−0.260		
		(−3.600)		
ΔS_t^{Loan}[B and below]			−0.422	
			(−5.311)	
ΔS_t^{Loan}[Not Available]				−0.410
				(−3.972)
Term Spread	✓	✓	✓	✓
FFR	✓	✓	✓	✓
Adjusted R^2	0.195	0.251	0.345	0.336
Incremental R^2	+ 0.006	+0.062	+0.156	+0.147
Observations	241	241	241	241

- Half of loan market borrowers are private/unrated firms. Limited overlap between bond and loan borrowers
- Repricing of risk by banks may be better reflected in loan spread

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Alternative explanation I: Uncertainty

	Industrial Production; Forecast horizon: 3 months				
	(1)	(2)	(3)	(4)	(5)
ΔS_t^{Loan}	-0.264	-0.385	-0.321	-0.245	-0.489
	(-4.404)	(-5.323)	(-5.039)	(-2.932)	(-3.672)
VIX	-0.351				
	(-3.109)				
EPU Index		-0.106			
		(-1.592)			
FinUn Index			-0.408		
			(-3.383)		
'Recession Index'				-0.500	
				(-4.190)	
PVS Index					0.238
					(1.647)
Term Spread	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓
Adjusted R^2	0.407	0.341	0.458	0.516	0.255
Observations	241	241	241	241	

- Uncertainty proxies contain predictive power for future outcomes
- Uncertainty can, however, not explain the incremental predictive power of the loan spread

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Alternative explanation II: Sentiment

- Investor sentiment appears important to understand credit spreads:
  - Credit spreads are too narrow during booms and proceed economic downturns (Greenwood and Hanson (2013)), López-Salido, Stein, and Zakrajšek (2017))
  - Investors under-price risk in good times, creating a credit boom. During downturns spreads overract in the opposite direction (Bordalo, Gennaioli, and Shleifer (2018)).
- Our focus in on the *relative* predictive power vis-a-vis bond spreads
- Borrower fundamentals drive relative predictive power of the loan spread (not excess loan premium, which would capture sentiment)

Back

Size Effect – Literature

- Evidence in the literature that it is the large firms that *drive* the business cycle
  - E.g. Crouzet and Mehrotra (2020), Gabaix (2011)
- On the other hand, smaller firms are more sensitive to changes in economic conditions
  - E.g. Begenau and Salomao (2019), Pflueger, Siriwardane, and Sunderam (2020), Crouzet and Mehrotra (2020)
- Our evidence suggests that smaller firms contain *information* about future business cycle movements

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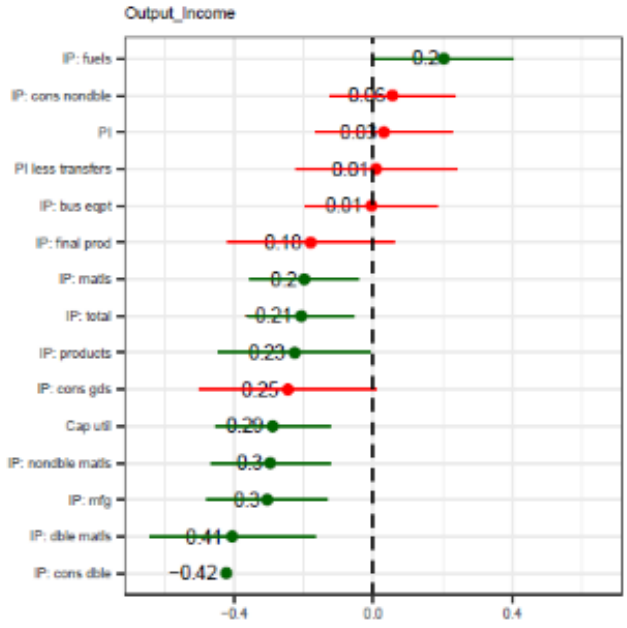
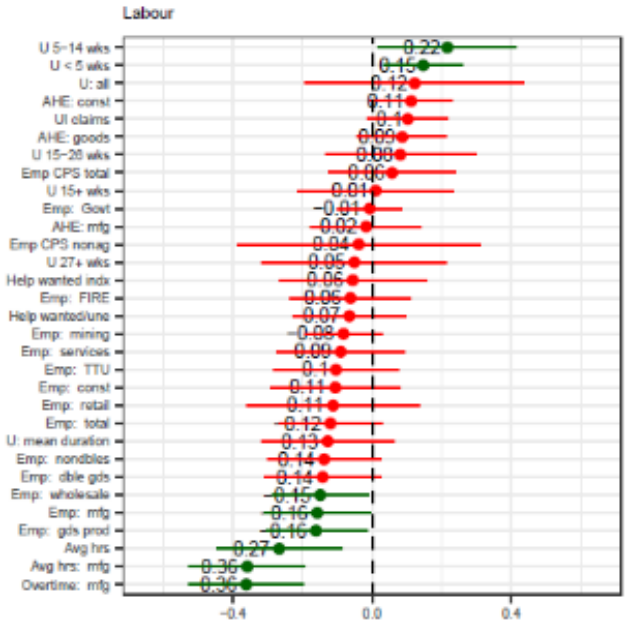
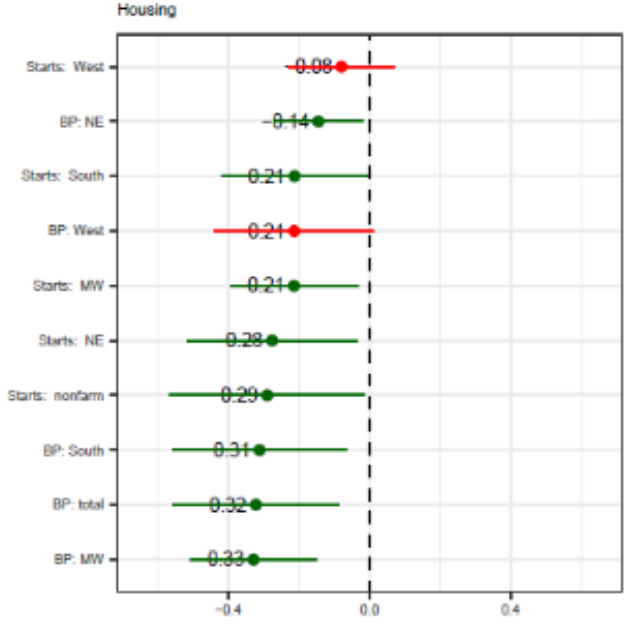
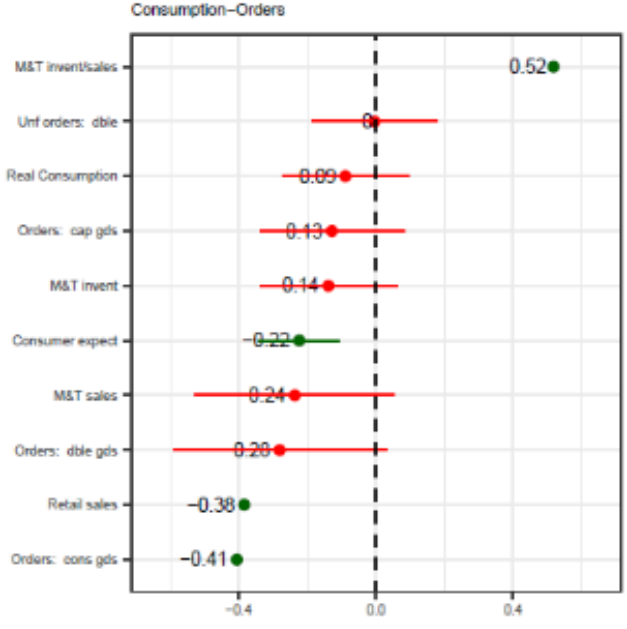
Alternative outcome variables - Bond Spread









Mechanism III: Behavioural

	Forecast horizon: h = 3m					
Panel A.	IP	PEMP	UE	TCU	NEW	INV
	(1)	(2)	(3)	(4)	(5)	(6)
ΔS_t^{Loan}	-0.335	-0.240	0.333	-0.306	-0.249	-0.218
	(-4.319)	(-3.488)	(2.868)	(-4.280)	(-3.606)	(-3.381)
HY Loan Share	0.209	0.090	-0.176	0.251	0.111	0.104
	(3.387)	(1.830)	(-2.397)	(4.467)	(1.718)	(2.300)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.381	0.677	0.308	0.438	0.145	0.585
Incremental R^2	+0.192	+0.060	+0.150	+0.188	+0.079	+0.074
Observations	241	241	241	241	241	241
Panel B.						
ΔS_t^{Loan}	-0.336	-0.235	0.313	-0.310	-0.251	-0.217
	(-4.000)	(-3.120)	(2.398)	(-4.018)	(-3.315)	(-3.051)
HY Bond Share	0.251	0.145	-0.315	0.245	0.092	0.120
	(3.279)	(2.715)	(-4.028)	(3.282)	(1.008)	(1.781)
Term Spread	✓	✓	✓	✓	✓	✓
FFR	✓	✓	✓	✓	✓	✓
$\Delta S_t^{Bond\ PC}$	✓	✓	✓	✓	✓	✓
Adjusted R^2	0.390	0.686	0.360	0.427	0.141	0.585
Incremental R^2	+0.201	+0.068	+0.202	+0.177	+0.075	+0.075
Observations	241	241	241	241	241	241

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