Forward Guidance and Corporate Lending

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Motivation and Research Questions (1)

What is forward guidance?

- Forward guidance is the communication with public about the likely future course of monetary policy. (Fed)

Examples:

- ...the Committee adopted a directive that was **biased toward a possible firming** of policy going forward. (05/10/1999)
- ...the Committee anticipates that weak economic conditions are likely to **warrant exceptionally low levels of the federal funds rate for some time**. (18/03/2009)
- ...this exceptionally low range for the federal funds rate will be appropriate **at least as long as the unemployment rate remains above 6-1/2 percent**... (12/12/2012)

Motivation and Research Questions (2)

- With conventional monetary policy constraint by the zero lower bound, forward guidance has become a popular monetary policy tool.
- The effect of forward guidance on the economy is a subject with substantial debate. The effect of forward guidance on the credit channel of monetary policy has never been investigated.

Research questions:

- How does forward guidance affect loan cost?
- How does forward guidance affects loan syndication?
- Does forward guidance increases risk-taking?

Key findings and contribution

Key findings:

- We find that the expansionary forward guidance reduces the corporate loan spreads in the post-2008 period over and above the effect of conventional monetary policy tools.
- We find that banks with higher capital levels offer lower spreads to riskier firms subsequent to expansionary forward guidance.
- It is easier for banks to lend to a new borrower with lower spreads subsequent to expansionary forward guidance. Syndication structure is less concentrated.

Contribution:

- This is the first research to examine how forward guidance affects the bank lending and banks' risk perception.
- We show a new channel (the forward guidance channel) via which monetary policy transmits to bank lending.

Theoretical Framework (1)

Transmission of monetary policy

- Interest rate channel (Bernanke and Blinder 1992): monetary policy easing $\rightarrow$ lower real interests (cost of capital)$\rightarrow$ rise in investment spending$\rightarrow$ rise in output
- Credit channel (Bernanke and Gertler 1995):
  - Bank lending channel: monetary policy easing $\rightarrow$ rise in deposits $\rightarrow$ rise in loans$\rightarrow$ rise in investment$\rightarrow$rise in output
  - Balance sheet channel: monetary policy easing $\rightarrow$ rise in the value of collateral$\rightarrow$ rise in loans$\rightarrow$ rise in investment$\rightarrow$rise in output
- Risk-taking channel (Borio and Zhu 2008):
  - Search for yield
  - The changes in interest rates affect borrowers' valuations, income, and cash flow and therefore change the lenders' risk tolerance.
  - The commitment of a central bank for lower (future) interest rates in the case of a threatening shock reduces the probability of large downside risks, thereby encouraging banks to assume greater risk.

Theoretical Framework (2)

Why should forward guidance matter?

- Anticipated interest rate reductions tend to correspond to a higher-risk position when current rates are relatively high (De Nicolò, Dell'Ariccia, Laeven, and Valencia 2010). When current rates are close to the zero lower bound, however, the focus turns to the effects of unconventional policy tools.

- Forward guidance, via increased transparency and commitment, reduces the information asymmetry between the central bank and lenders and help lenders to anticipate future funding costs.

- The expected path of future short-term interest rate rather than the current overnight rate is more important for economic decisions (Woodford 2012).

Hypothesis

- H1: Expansionary Odyssean forward guidance lowers the cost of loans.

- H2: The negative effect of Odyssean forward guidance on the cost of loans will be more potent for loans originated by highly capitalized banks. (Better-capitalized banks are better able to pass changes in forward-looking expectations along to lending rates.)

Related Literature

Effects of monetary policy on bank lending

- Bernanke and Blinder 1992; Kashyap and Stein 2000; Jimenez, Ongena, Peydro, and Saurina 2014 (Monetary policy stimulates the credit supply)

Expansionary monetary policy increases bank risk-taking

- Maddaloni and Peydro 2011; Dell'Ariccia, Laeven, and Suarez 2017; Delis, Hasan, and Milonidis 2017; Paligorova and Santos 2017 (Monetary policy easing softens lending standard, leads to riskier loans)

Effects of unconventional monetary policy on bank lending

- Rodnyansky and Darmouni 2017; Chakraborty, Goldstein, and MacKinlay 2020 (QE's effect on bank lending)

Measures of Forward Guidance (1)

- We parse the FOMC statements and select the dates with monetary policy commitments.
- For the post-crisis period we distinguish between Odyssean and Delphic forward.
- We pick 19 Odessean and 34 Delphic forward guidance dates and code them into an indicator variable

Measures of Forward Guidance (2)

- Forward Guidance measures

$$
Forward\ guidance\ (t-n) = \begin{cases} 1, & \text{if the most recent expansionary} \\ & \text{guidance is provided} \\ & \text{n month(s) ago} \\ -1, & \text{if the most recent contractionary} \\ & \text{guidance is provided} \\ & \text{n month(s) ago} \\ 0, & \text{otherwise} \end{cases}
$$

n=1, 2, 3

Alternative Measures of Forward Guidance

Gurkaynak, Sack, and Swanson,2005 method

- We measure the monetary policy shock using the unexpected changes of federal funds futures and Eurodollar futures within a window around the FOMC announcement
- Decompose this shock into a target factor corresponding to surprise changes in the current policy rate, and a path factor corresponding to changes in the expected future rates.
- The path factor measures forward guidance because it contains the monetary policy shock additional to that arising from changes to the current policy rate.
- Categorize the path factor into Odyssean and Delphic by evaluating its co-movements with future interest rates, stock prices, and inflation-linked swaps (Altavilla et al. 2019).

Data Source

- **Dealscan** Syndicated loan data with detailed loan characteristics as well as lender and borrower identities. (New loan data eases the endogeneity problem; loan controls ensure the loan spreads capture the ex-ante risk)
- **Call reports & FR Y-9C reports** Lender data (Commercial banks and bank holding companies), merged with loan data by lender names and locations.
- **Compustat** Borrower data, merged with loan data by Chava and Roberts (2008) linking table.
- **FRED Economic Data** Economy-level data
- The merge results in 20,615 syndicated loans borrowed by 3,834 US companies from 329 US banks between May 1999 and June 2017.

Summary Statistics

		Pre-financial crisis sample period					Sample period following the pre-financial crisis			
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Loan-level variables										
Loan spread	13,122	4.890	0.864	0.405	7.313	7,493	5.331	0.508	2.708	7.111
Loan amount	13,122	4.818	1.721	-6.639	10.309	7,493	5.602	1.380	-2.303	10.800
Maturity	13,122	3.580	1.962	0.005	20	7,493	4.482	1.459	0.083	16
Credit line	13,122	0.563	0.496	0	1	7,493	0.621	0.485	0	1
Term loan	13,122	0.246	0.431	0	1	7,493	0.330	0.470	0	1
Corporate purpose	13,122	0.320	0.467	0	1	7,493	0.671	0.470	0	1
Working capital	13,122	0.231	0.422	0	1	7,493	0.105	0.306	0	1
Debt repayment	13,122	0.115	0.319	0	1	7,493	0.030	0.170	0	1
Secured	13,122	1.246	0.856	0	2	7,493	1.249	0.859	0	2
Dividend restrictions	13,122	1.248	0.901	0	2	7,493	0.891	0.884	0	2
Number of lenders	13,122	1.677	1.041	0	5.088	7,493	1.888	0.827	0	4.248
Firm-level variables										
Book leverage	13,122	-0.409	0.198	0.000	-1.000	7,493	-0.389	0.194	0.000	-0.960
Z-score	13,122	0.629	0.823	-3.131	2.326	7,493	0.653	0.730	-3.131	2.441
Bank-level variables										
Total asset	13,122	19.808	1.330	9.501	21.279	7,493	20.884	1.225	10.555	21.586
Capital ratio	13,122	0.079	0.015	0.056	0.149	7,493	0.102	0.018	0.056	0.149
ROA	13,122	0.007	0.004	-0.012	0.048	7,493	0.004	0.004	-0.039	0.031
Liquidity	13,122	0.047	0.026	0	0.212	7,493	0.062	0.048	0	0.474
Charge-off	13,122	0.002	0.002	0	0.016	7,493	0.002	0.003	0	0.028
Economy-level variables										
GDP growth	38	1.205	0.593	0.207	2.448	35	0.766	0.750	1.858	1.888
VIX	38	20.317	6.154	11.035	35.068	35	20.675	9.620	11.692	58.596
Shadow rate	38	3.261	1.947	0.402	6.224	35	-1.677	1.905	-5.301	1.725

Empirical Analysis (1)

Identification of the supply side effect

- new loan origination
- saturate the model with firm×year fixed effects
- interaction between forward guidance and bank characteristics

Identification of the risk-taking effect

- Triple interaction of forward guidance, bank capitalisation and firm risk measures

Baseline regressions

$$lspread_{l,f,b,t} = a_{f,y} + \delta_n \times \textit{forward guidance}\,(t-n) + \alpha \times \textit{shadow rate}_{t-1} +$$
$$\beta' \boldsymbol{X_{l,t}} + \gamma' \boldsymbol{Y_{b,t-1}} + \phi' \boldsymbol{Z_{f,t-1}} + \chi' \boldsymbol{E_{t-1}} + \epsilon_{l,f,b,t} \quad (1)$$

$lspread_{l,f,b,t}$: natural log of the all-in-spread-drawn of a syndicated loan (l) to firm (f) from bank (b) at time (t)

Shadow rate: control for the rest of monetary policy actions

X: loan control variables

Y: bank control variables

Z: firm control variables

E: macro-economy control variables

Triple interaction

$$
lspread_{l,f,b,t} = a_{f,y} + \delta_n \, forward \, guidance \, (t-n) +
$$
$$
\lambda_{1n} \times forward \, guidacne \, (t-n) \times capital_{b,t-1} + \lambda_{2n} \, forward \, guidance, (t-n)
$$
$$
\times R_{f,t-1} + \lambda_{3n} \, forward \, guidance \, (t-n) \times capital_{b,t-1} \times R_{f,t-1}
$$
$$
+ \, \alpha \, shadow \, rate_{t-1} + \theta_1 \, shadow \, rate_{t-1} \times capital_{b,t-1} +
$$
$$
\theta_2 \, shadow \, rate_{t-1} \times R_{f,t-1} + \theta_3 \, shadow \, rate_{t-1} \times capital_{b,t-1} \times R_{f,t-1}
$$
$$
+ \, \beta' \boldsymbol{X_{l,t}} + \gamma' \boldsymbol{Y_{b,t-1}} + \phi' \boldsymbol{Z_{f,t-1}} + \chi' \boldsymbol{E_{t-1}} + \epsilon_{l,f,b,t} \quad (2)
$$

R: firm risk measure (book leverage/Z-score)

Syndicated loans issued after an expansionary Odyssean forward guidance have significant lower loan spreads after September 2008.
Delphic forward guidance is insignificant.

	Odyssean forward guidance				Delphic forward guidance			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Forward guidance (t-1)	-0.089***			-0.133***	-0.021			-0.022
	(-3.16)			(-4.13)	(-0.93)			(-0.92)
Forward guidance (t-2)		-0.114***		-0.157***		-0.008		-0.012
		(-4.13)		(-5.06)		(-0.29)		(-0.39)
Forward guidance (t-3)			-0.111***	-0.150***			-0.012	-0.018
			(-3.44)	(-4.43)			(-0.21)	(-0.31)
Shadow rate	0.001	-0.001	-0.001	-0.010	0.002	0.002	0.002	0.002
	(0.03)	(-0.08)	(-0.08)	(-0.66)	(0.10)	(0.14)	(0.14)	(0.12)
Loan-level variables	Y	Y	Y	Y	Y	Y	Y	Y
Firm-level variables	Y	Y	Y	Y	Y	Y	Y	Y
Bank-level variables	Y	Y	Y	Y	Y	Y	Y	Y
Economy-level variables	Y	Y	Y	Y	Y	Y	Y	Y
Firm × year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Number of observations	7,493	7,493	7,493	7,493	7,493	7,493	7,493	7,493

Baseline – pre-crisis period

Forward guidance is powerless before the global financial crisis.

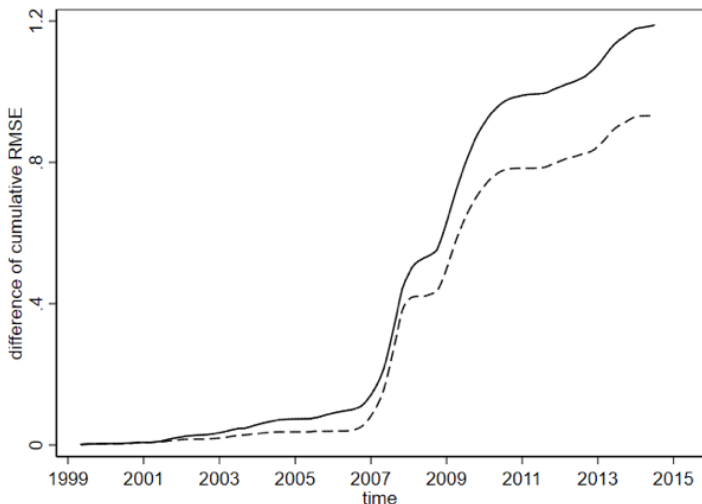|	Forward guidance before financial crisis			
	(9)	(10)	(11)	(12)
Forward guidance (t-1)	0.027			0.030
	(0.86)			(0.97)
Forward guidance (t-2)		0.023		0.027
		(0.64)		(0.76)
Forward guidance (t-3)			0.013	0.018
			(0.43)	(0.59)
Shadow rate	-0.016*	-0.016*	-0.016*	-0.015
	(-1.78)	(-1.70)	(-1.77)	(-1.63)
Loan-level variables	Y	Y	Y	Y
Firm-level variables	Y	Y	Y	Y
Bank-level variables	Y	Y	Y	Y
Economy-level variables	Y	Y	Y	Y
Firm × year fixed effects	Y	Y	Y	Y
Number of observations	13,122	13,122	13,122	13,122

Is the result sub-sample specific?

A graph analysis

- We regress three models and get their cumulative root mean square errors (cumulative RMSE) by a 2-year rolling window.
    - forward guidance model: equation (1)
    - shadow rate model: no forward guidance measure
    - benchmark model: no forward guidance, no shadow rate
- *difference =*
  Cumulative RMSE$_{benchmark}$ − Cumulative RMSE$_{FG/shadowrate}$
- Whenever the difference increases, the forward guidance model or shadow rate model outperforms the benchmark model.

Is the result sub-sample specific?

- Given any two points, an upward slope means forward guidance or shadow rate improves the explaining power of the model.

Risk-taking effect (1)

- Highly capitalized banks react more strongly to forward guidance.
- Borrowers with weaker balance sheet get lower spreads from highly capitalized banks when forward guidance is in place.

	R = Book leverage			
	(1)	(2)	(3)	(4)
Forward guidance (t-1)*Capital ratio	-11.450**			-11.920**
	(-2.19)			(-2.24)
Forward guidance (t-2)*Capital ratio		-8.571***		-9.525***
		(-3.16)		(-3.10)
Forward guidance (t-3)*Capital ratio			0.928	-1.304
			(0.20)	(-0.26)
Forward guidance (t-1)*R*Capital ratio	-25.86**			-27.250**
	(2.41)			(2.56)
Forward guidance (t-2)*R*Capital ratio		-15.910**		-19.010**
		(2.32)		(2.58)
Forward guidance (t-3)*R*Capital ratio			-1.841	-6.661
			(0.20)	(0.67)
Shadow rate and its interactions	Y	Y	Y	Y
Loan-level variables	Y	Y	Y	Y
Firm-level variables	Y	Y	Y	Y
Bank-level variables	Y	Y	Y	Y
Economy-level variables	Y	Y	Y	Y
Firm × year fixed effects	Y	Y	Y	Y
Number of observations	7,493	7,493	7,493	7,493

Risk-taking effect (2)

- Borrowers with higher default probability get lower spreads from highly capitalized banks when forward guidance is in place.

	R = Z-score			
	(5)	(6)	(7)	(8)
Forward guidance (t-1)*Capital ratio	-5.977**			-6.132**
	(-2.12)			(-2.04)
Forward guidance (t-2)*Capital ratio		-4.402**		-4.822**
		(-2.35)		(-2.19)
Forward guidance (t-3)*Capital ratio			2.251	0.999
			(0.99)	(0.41)
Forward guidance (t-1)*R*Capital ratio	5.457**			5.594***
	(2.57)			(2.61)
Forward guidance (t-2)*R*Capital ratio		2.322		2.861*
		(1.48)		(1.70)
Forward guidance (t-3)*R*Capital ratio			-2.463	-1.436
			(-1.25)	(-0.72)
Shadow rate and its interactions	Y	Y	Y	Y
Loan-level variables	Y	Y	Y	Y
Firm-level variables	Y	Y	Y	Y
Bank-level variables	Y	Y	Y	Y
Economy-level variables	Y	Y	Y	Y
Firm × year fixed effects	Y	Y	Y	Y
Number of observations	7,493	7,493	7,493	7,493

Multicollinearity from the forward guidance information both in our measure and in the shadow rate.
Exclusion of QE dates and shadow rate residual.

	R=Book leverage	R=Z-score		R=Book leverage	R=Z-score
	(1)	(2)	(3)	(4)	(5)	(6)
Forward guidance (t-1)	-0.158***	0.983	0.315	-0.110**	3.143***	1.877***
	(-3.72)	(1.60)	(0.85)	(-2.03)	(5.26)	(4.76)
Forward guidance (t-2)	-0.203***	0.673**	0.147	-0.141***	0.390	0.166
	(-5.50)	(2.14)	(0.63)	(-4.77)	(1.16)	(0.77)
Forward guidance (t-3)	-0.194***	-0.642	-0.682***	-0.178***	-0.354	-0.408
	(-4.73)	(-1.08)	(-2.24)	(-4.83)	(-0.69)	(-1.51)
Forward guidance (t-1)*Capital ratio		-10.080*	-4.284		-30.19***	-18.58***
		(-1.77)	(-1.25)		(-5.49)	(-5.11)
Forward guidance (t-2)*Capital ratio		-7.903***	-2.830		-4.738	-2.641
		(-2.67)	(-1.25)		(-1.51)	(-1.27)
Forward guidance (t-3)*Capital ratio		3.877	4.796*		1.865	2.655
		(0.73)	(1.75)		(0.40)	(1.08)
Forward guidance (t-1)*R*Capital ratio		-26.200**	5.086**		-66.260***	14.910***
		(-2.39)	(2.04)		(-5.84)	(5.60)
Forward guidance (t-2)*R*Capital ratio		-16.400**	1.265		-9.866	1.946
		(-2.43)	(0.75)		(-1.31)	(1.20)
Forward guidance (t-3)*R*Capital ratio		1.752	-3.452		-0.417	-2.083
		(0.18)	(-1.45)		(-0.05)	(-1.07)
Controls	Y	Y	Y	Y	Y	Y
Firm × year fixed effects	Y	Y	Y	Y	Y	Y
Number of observations	7,493	7,493	7,493	7,493	7,493	7,493

Quarterly forward guidance measure.

		R=Book leverage	R=Z-score
	(1)	(2)	(3)
Quarterly forward guidance (t-1)	-0.109***	0.721*	0.265
	(-3.81)	(1.94)	(1.13)
Shadow rate	-0.00783	-0.614***	-0.332***
	(-0.53)	(-6.70)	(-4.91)
Forward guidance (t-1)*Capital ratio		-8.053**	-3.524
		(-2.37)	(-1.64)
Forward guidance (t-1)*R*Capital ratio		-19.79***	2.907**
		(2.74)	(2.09)
Shadow rate*Capital ratio		5.808***	3.120***
		(6.62)	(4.71)
Shadow rate*R*capital ratio		12.20***	-2.470***
		(-6.21)	(-6.60)
Loan-level variables	Y	Y	Y
Firm-level variables	Y	Y	Y
Bank-level variables	Y	Y	Y
Economy-level variables	Y	Y	Y
Firm × year fixed effects	Y	Y	Y
Number of observations	7,493	7,493	7,493

Numerical measure of forward guidance.

		R=Book leverage	R=Z-score
	(1)	(2)	(3)
GSS forward guidance (t-1)	0.003	-0.168***	-0.058***
	(1.33)	(-3.24)	(-2.81)
GSS forward guidance (t-2)	0.012***	-0.149***	-0.070**
	(2.80)	(-3.06)	(-2.57)
GSS forward guidance (t-2)	0.001	-0.138***	-0.057**
	(0.55)	(-3.43)	(-2.48)
GSS forward guidance (t-1)*R*Capital ratio		3.548***	-0.341*
		(2.78)	(-1.79)
GSS forward guidance (t-2)*R*Capital ratio		2.767***	-0.421***
		(3.03)	(-2.95)
GSS forward guidance (t-3)*R*Capital ratio		2.422***	-0.327
		(3.05)	(-1.54)
Controls	Y	Y	Y
Firm-year FE	Y	Y	Y
Number of observations	7,493	7,493	7,493

Robustness (4)

Other robustness tests:

- Effective federal funds rate instead of shadow rate
- Additional macroeconomy controls (credit spread, Treasury yield, inflation)
- Different Fixed effects (bank fixed effects, firm fixed effects, bank $\times$ year fixed effects and bank $\times$ firm fixed effects)

New borrower-lender relationship

- New firms to a lender get lower spreads subsequent to forward guidance.

	All loans	Term loan	Credit line
Forward guidance (t-1)	-0.138***	-0.064*	-0.090***
	(-3.28)	(-1.84)	(-2.69)
Forward guidance (t-2)	-0.110***	-0.006	-0.043
	(-2.80)	(-0.20)	(-1.43)
Forward guidance (t-3)	-0.116***	-0.088*	-0.057*
	(-2.87)	(-1.91)	(-1.89)
New borrower	0.081***	0.031	0.035**
	(3.99)	(1.34)	(2.23)
Forward guidance (t-1)*New borrower	0.0181	0.029	-0.002
	(0.43)	(0.63)	(-0.05)
Forward guidance (t-2)*New borrower	-0.085*	-0.083**	-0.035
	(-1.86)	(-2.40)	(-0.91)
Forward guidance (t-3)*New borrower	-0.053	-0.001	-0.072**
	(-1.32)	(-0.01)	(-2.54)
Loan-level variables	Y	Y	Y
Firm-level variables	Y	Y	Y
Bank-level variables	Y	Y	Y
Economy-level variables	Y	Y	Y
Firm-year fixed effects	Y	Y	Y
Number of observations	7493	2,469	4,654

Syndication structure

- Syndication structure is less concentrated when forward guidance is in place.

	Share held by lead	HHI	Number of new participants
Forward guidance (t-1)	-0.055*	-682.9**	0.365
	(-1.73)	(-2.02)	(0.99)
Forward guidance (t-2)	0.044	511.7	0.685*
	(0.94)	(0.98)	(1.82)
Forward guidance (t-3)	-0.033	-326.9	0.140
	(-0.91)	(-0.81)	(0.34)
Forward guidance (t-1)*Borrower reputation	0.024*	306.2**	-0.157
	(1.78)	(2.10)	(-0.91)
Forward guidance (t-2)*Borrower reputation	-0.015	-154.0	-0.381**
	(-0.75)	(-0.72)	(-2.23)
Forward guidance (t-3)*Borrower reputation	0.014	133.4	0.071
	(0.88)	(0.77)	(0.37)
Shadow rate	0.002	50.62	-0.016
	(0.34)	(0.65)	(-0.19)
Loan controls	Y	Y	Y
Firm Controls	Y	Y	Y
Economy controls	Y	Y	Y
Industry fixed effects	Y	Y	Y
Year fixed effects	Y	Y	Y
Number of observations	2048	1879	6667

Conclusion

- We study the effects of forward guidance on bank lending and find that forward guidance is powerless before the global financial crisis but decreases the spreads of newly issued loans in the next three months since the crisis.
- The effect reaches its peak after two months and is strengthened for highly capitalised banks.
- We find that banks offer lower spreads to firms with weaker capital structure, higher default probability and new borrowers when forward guidance is in place, which supports the existence of a forward guidance channel of monetary policy transmission.