Analysts' Capital Expenditure Forecasts and Bank Debt Contracting

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Motivation

- Past research focusing on **earnings forecasts**; predominantly examining **equity market** economic outcomes (e.g., Mansi et al., 2011, Call et al., 2022).

- However, particularly over the last fifteen years, analysts' forecasts of a variety of **alternative performance measures** and **financial benchmarks** have become increasingly available-including **analysts' capex forecasts**.

- likely influence a **variety** of **market participants** outside of the **capital markets**.

⟶ Examine the extent to which **analysts' capex forecasts** influence lenders' **debt financing** by **increasing** the **information available** to **lenders** about firm **growth opportunities** and **external expectations**, thereby **decreasing** lenders' **processing costs.**

Motivation (I)

- **Analyst forecasts,** especially those related to **capex**, offer **insights** into a company's **future investment plans,** which directly influence a **lender's assessment** of **risk**, **expected cash flows**, and **overall creditworthiness**.

- According to traditional banking theory, the **most important** type of **risk** faced by banks when they provide **loans** is **credit risk**: the primary **determinant** of **bank loan pricing** (e.g., Freixas and Rochet, 1997; Graham et al., 2008; Hasan et al., 2012).

- Analyst capex forecasts should reflect firms' **investment potential** from a **separate,** but **credible**, source and relay information about firms' **future growth opportunities** that is **incrementally useful** to investors beyond what is **already known** to them through **other information sources**.

- Choi et al. (2020) provide evidence that **managers themselves** benefit from **analysts' capex forecasts**, helping them **invest more efficiently -** forecasts enlist **increased investor monitoring** and **oversight**.

Motivation (II)

- Bank loans are typically **privately negotiated**: lenders can **tailor** a **loan** to their **own firm growth** and **investment projections**.

- Given the **inherent uncertainty** and **difficulty** in **forecasting**, **lenders** likely seek many **alternative** and viable **sources** of **information**.

- Analysts' **capex forecasts** could serve as a **credible**, **public signal that** can **shape** their **perceptions** and provide **comparison benchmarks** for firms.

- In this way, we ask the **question** of whether **information intermediaries external** to the firm, i.e., financial **analysts**, can aid **lenders** in their **firm-related decision-making**.

- However, because **lenders** can be viewed as a type of **insider** to the firm (i.e., given they are **not subject** to **Regulation Fair Disclosure** and are typically offered **unique access** to the firm):

- significant **reason** to believe that **analysts external** to the firm have **little** to **offer lenders** in terms of **analysis** and **insight**.

RESEARCH HYPOTHESIS

- We expect that **analyst capex forecasts** are associated with **creditor perceptions** reflected on **bank loan spreads** by incorporating **information** about firms' **growth opportunities**, and **corresponding risk of default** conditional on firms' **growth opportunities** in a way **incrementally useful** to **other information sources** available to bank lenders.

- We initially focus on **loan spreads**, because the **priced cost** of borrowing directly incorporates **borrower risk**.

Analyst capex forecasts may be associated with **lender perceptions** reflected in **interest** rates in an **incremental** and **useful** manner for at least **two reasons:**

RESEARCH HYPOTHESIS (I)

1) **Analyst capex forecasts** should provide an **expert** and **knowledgeable estimate** of firms' anticipated **growth opportunities**; **justify** the **anticipated** level of **investment** that should be made by firms to **achieve** this **growth.**

- **Managers** may possess **better firm-specific information** than analysts, but **analysts** are expected to have a **better understanding** of the **macro economy-wide** and **industry factors** affecting firm **growth** (e.g., Hutton et al., 2012; Ali et al., 2023).

- Analysts obtain **public/private industry-related signals** from **multiple firms** in an industry: **industry-related information superior** to that of firm **managers** (Choi et al., 2020; Ali et al., 2023).

- analysts possess a **competitive advantage** in **understanding** how factors **external** to firms could affect their **growth potential** and plans.

RESEARCH HYPOTHESIS (II)

2) Analysts' **signal** for firm **growth potential** via their **capex forecasts** makes **managers' unjustifiable deviations** from **analysts' expectations** more **difficult** (Choi et al., 2020).

- such forecasts should **enhance** the firms' **information environment** and **facilitate external monitoring**.

While **bank lenders** should be able to **better monitor** their **borrowers** than **public debt** investors and obtain **information directly** from **borrowing firms** (e.g., Fama 1985; Diamond 1991), **analyst forecasts** provide an **additional opportunity** to **expand** their **information set**, **lessen** their **own processing costs**, and **assistance** in **monitoring**.

The above argumentation **assumes** that analysts **function** as **external** and **independent assessors** of firms' **growth opportunities**.

RESEARCH HYPOTHESIS - THE OPPOSITE VIEW

- However, being **external**, analysts are **not privy** to all **managers plans** or **opportunities.**

- Analysts have also shown significant **propensity** to issue **biased forecasts**, be **overly busy**, and in some cases even **lack sophistication** (Bradshaw et al., 2012; Cen et al., 2013; Bradshaw et al., 2016; Driskill et al., 2020; Hsu and Wang, 2021).

- **Banks** may **not** necessarily **need more information** on firms, especially when they have **relationships** with those firms and have **easy access** to greater amounts of firm **information** than external **analysts** are privy to (Fama 1985; Diamond 1991; Berger and Udell, 1995; Peterson and Rajan, 1995).

- **Banks** could also have accumulated their **own proprietary information** and **experience** thanks to **systematically providing funding** to the **borrower** or to firms from its **industry** sector (e.g., Berger et al., 2017; Blickle et al., 2025).

RESEARCH HYPOTHESIS FORMULATION

Thus:

1) Overall, analysts may **possess information** that provides **external validity** by knowledgeable experts about firms' **growth opportunities,** representing an **objective justification** and **validation** about the **level** of **capex** firms should engage in, **expanding** the **information sets** of firms available to lenders.

2) However, **analysts** may **lack** enough **firm-specific knowledge** to produce **value-relevant** capex forecasts and **lenders** themselves may develop **industry-specific knowledge**.

Thus, the overall **effect** of **analyst capex forecasts** on **loan spreads** is unclear, making it an **empirical question**.

H1: Analyst capex forecasts are not associated with the bank debt cost of borrowing.

METHODOLOGY - DATA

- We merge the Dealscan data with the Compustat data using the linking table provided by Chava and Roberts (2008).

- We select 2008 as a starting year of our sample period because analysts' capex forecasts became largely available on IBES from this year (Choi et al., 2020). Our sample ends in 2020 as the Compustat-Dealscan linking table is only available till this year.

- We treat each loan facility as a separate observation because loan contract terms, such as interest spreads, vary across facilities within the same deal (e.g., Kim et al., 2011; Bushman et al., 2021).

METHODOLOGY

- Loans issued to financial firms (SIC codes 6000 - 6999) and utilities firms (SIC codes 4900 - 4999) are excluded from the sample.

- Our final sample includes 13,391 loans issued to 2,084 US-domiciled firms over the period from 2008 to 2020.

METHODOLOGY

3.2 Research design

We estimate the following model to examine the effect of analyst capex forecasts on the cost of bank borrowing:

$$Loan\ spread = \alpha_0 + \alpha_1 N_CPXAF + Controls \qquad (1)$$

In this model, *Loan spread* measures the cost of bank borrowing defined as the natural logarithm of the all-in-drawn interest spread.[1] To capture the effect of analyst capex forecasts, following Choi et al. (2020), we define a variable, *N_CPXAF*, which is the natural logarithm of one plus the number of unique financial analysts who issue capex forecasts for the borrower's year *t* prior to loan contract inspection.[2] The coefficient on *N_CPXAF* is expected to be negative if analyst capex forecasts reduce loan spreads.

METHODOLOGY (I)

Control variables selected following prior studies (e.g., Bushman et al., 2017; Chen et al., 2016; Graham et al., 2008; Kubick et al., 2025).

- **Analyst earnings forecasts** (*N_EPSAF*) and **management capex guidance** (*CPXGD*) to control for the effects of other forecasts on loan contract terms.

- ***N_EPSAF*** = the natural logarithm of one plus the number of analyst earnings forecasts for borrowers that have no analyst capex forecasts.

- ***CPXGD*** = an indicator variable that equals one if a borrower issues management capex guidance.

- **99.78%** of borrowers in our sample that have an analyst capex forecast also have an analyst earnings forecast; however, **32.57%** of borrowers that have an analyst earnings forecast have no analyst capex forecasts.

METHODOLOGY (II)

- **Loan-specific attributes** (e.g., Chen et al., 2016; Kubick et al., 2025):

✓ **Revolvers** (*Revolver*), the **size** of the **loan contract** (*Loan size*), **number** of **financial covenants** (*Financial covenants*), the existence of a **capex covenant** (*Capex covenant*), **loan maturity** (*Maturity*), the **number** of **lenders** in the loan (*N_Lenders*), the existence of **performance pricing provisions** (*PP*), **secured loans** (*Collateral*), and **loan purpose FE**.

- **Borrower characteristics** (e.g., Balachandran et al, 2019; Campello and Gao, 2017; Cohen et al., 2022 ; Graham et al., 2008; Kubick et al., 2025):

✓ **firm size** (*Firm size*), **market-to-book ratio** (*MTB*), **leverage ratio** (*Leverage*), **return on assets** (*Profitability*), **asset tangibility** (*Tangibility*), **cash flow volatility** (*CFO volatility*), **bankruptcy risk** (*Z-score*), and a dummy variable for whether the **borrower** is **rated** (*Rated*).

- **Control variables** measured in the **year prior** to the loan issuance.
- Control for **year** and **industry** FE and compute **standard errors using two-way firm** and **year clusters**.

DESCRIPTIVE STATISTICS

	N	Mean	SD	25th	Median	75th
Loan spread	13,391	5.378	0.555	5.011	5.298	5.745
N_CPXAF	13,391	0.749	0.789	0.000	0.693	1.386
N_EPSAF	13,391	0.206	0.531	0.000	0.000	0.000
CPXGD	13,391	0.458	0.498	0.000	0.000	1.000
Revolver	13,391	0.557	0.497	0.000	1.000	1.000
Loan size	13,391	5.514	1.451	4.605	5.646	6.551
Financial covenants	13,391	0.937	1.019	0.000	1.000	2.000
Capex covenant	13,391	0.093	0.290	0.000	0.000	0.000
Maturity	13,391	3.815	0.550	3.638	4.094	4.094
N_Lenders	13,391	1.715	0.873	1.099	1.792	2.303
PP	13,391	0.257	0.437	0.000	0.000	1.000
Collateral	13,391	0.578	0.494	0.000	1.000	1.000
Firm size	13,391	7.777	1.654	6.655	7.752	8.860
MTB	13,391	3.050	7.712	1.265	2.222	3.813
Leverage	13,391	0.337	0.224	0.180	0.309	0.464
Profitability	13,391	0.126	0.081	0.089	0.123	0.164
Tangibility	13,391	0.271	0.235	0.088	0.186	0.398
CFO volatility	13,391	0.029	0.027	0.011	0.021	0.038
Z-score	13,391	1.400	1.387	0.658	1.425	2.253
Rated	13,391	0.387	0.487	0.000	0.000	1.000

A one standard deviation increase in the number of analyst capex forecasts leads to a decrease of **10.58 basis** points in the loan spread.

Table 2. Analysts' capex forecasts and loan pricing

	Loan spread		
	(1)	(2)	(3)
N_CPXAF			-0.053***
			(-6.021)
N_EPSAF		-0.008	-0.030***
		(-0.777)	(-2.626)
CPXGD	-0.018*		-0.005
	(-1.758)		(-0.454)
Revolver	-0.208***	-0.208***	-0.207***
	(-26.537)	(-26.518)	(-26.416)
Loan size	-0.083***	-0.082***	-0.083***
	(-16.285)	(-16.178)	(-16.524)
Financial covenants	-0.054***	-0.054***	-0.053***
	(-9.854)	(-9.953)	(-9.830)
Capex covenant	0.070***	0.070***	0.070***
	(2.702)	(2.703)	(2.739)
Maturity	0.079***	0.079***	0.079***
	(7.503)	(7.471)	(7.566)
N_Lenders	-0.040***	-0.040***	-0.041***
	(-5.608)	(-5.583)	(-5.838)
PP	-0.098***	-0.098***	-0.094***
	(-8.631)	(-8.641)	(-8.396)
Collateral	0.293***	0.294***	0.289***
	(25.461)	(25.417)	(24.915)
Firm size	-0.014***	-0.015***	-0.006
	(-2.831)	(-2.967)	(-1.234)
MTB	-0.001*	-0.001*	-0.001*
	(-1.686)	(-1.724)	(-1.664)
Leverage	0.285***	0.284***	0.272***
	(9.127)	(9.103)	(8.785)
Profitability	-0.646***	-0.653***	-0.597***
	(-7.043)	(-7.115)	(-6.574)
Tangibility	0.082**	0.075**	0.086**
	(2.243)	(2.061)	(2.345)
CFO volatility	0.078	0.073	0.091
	(0.305)	(0.287)	(0.359)
Z-score	-0.041***	-0.041***	-0.041***
	(-7.406)	(-7.453)	(-7.578)
Rated	-0.083***	-0.086***	-0.074***
	(-7.003)	(-7.275)	(-6.226)
Constant	5.789***	5.799***	5.744***
	(59.816)	(59.808)	(59.344)
Loan purpose FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	13,391	13,391	13,391
Adjusted R-squared	0.522	0.521	0.525

ENDOGENEITY CONTROLS

Results are **robust** to the use of **loan purpose**, **industry** and **year FE**, and incremental to any **information** conveyed to **lenders** through analyst **earnings**, rather than **capex** forecasts, and **managers' own earnings guidance** for the firm.

But: results might be still subject to **endogeneity concerns**.

- As **analysts' decisions** to issue capex forecasts are **not random**, **unobserved analyst characteristics** might significantly influence the **observed variation** in the **decision** to issue **capex** forecasts, and the **quality** of the **forecasts** (Choi et al., 2020).

- Potential **omitted factors** that **simultaneously** affect both **lenders' loan pricing** and analysts' **capex forecast decisions**, e.g., **variations** in firms' **growth opportunities** and **earnings generation potential**, affecting the **decision** of analysts to **issue capex** forecasts together with **lenders'** loan **pricing patterns**.

- To mitigate potential endogeneity concerns: **IV analysis** and **entropy balancing**.

ENDOGENEITY CONTROLS: IV ANALYSIS

- Use the **median broker size** across **all analysts** issuing **capex** forecasts (*Broker size*) as an **IV** for analysts' capex forecasts.

- This variable should be highly **correlated** with analyst **capex forecast coverage** (**relevance** condition) but **not independently associated** with bank loan **spreads** (**exclusion** restriction) (Choi et al., 2020):

- Analysts from **larger brokerage firms** have **more resources** and **better access** to **information**, enabling them to produce **forecasts** beyond just **earnings estimates**; **broker size** unlikely to **directly affect** lenders' loan **pricing decisions** except through its **effect** on **analysts' decisions** to issue a **capex** forecast for a borrower.

- In the **first-stage**, we regress number of analyst capex forecasts (*N_CPXAF*) on the IV *Broker size* plus control variables.

- In the **second-stage,** we estimate our baseline model using the predicted values for the number of analyst capex forecasts (*Pred*(*N_CPXAF*)) as the regressor obtained from the first-stage regression.

Table 3. Analysts' capex forecasts and loan pricing: Instrumental variable test

	N_CPXAF	*Loan spread*
	(1)	(2)
Broker size	0.358***	
	(76.547)	
N_CPXAF		-0.063***
		(-5.641)
N_EPSAF	-0.017***	-0.034***
	(-2.689)	(-2.834)
CPXGD	0.004	-0.002
	(0.280)	(-0.211)
Revolver	0.011*	-0.267***
	(1.655)	(-26.496)
Loan size	-0.002	-0.083***
	(-0.288)	(-16.607)
Financial covenants	-0.002	-0.053***
	(-0.342)	(-9.853)
Capex covenant	0.025	0.070***
	(1.455)	(2.754)
Maturity	-0.020**	0.079***
	(-2.324)	(7.600)
N_Lenders	-0.023***	-0.041***
	(-3.028)	(-5.902)
PP	0.043***	-0.093***
	(3.482)	(-8.414)
Collateral	-0.044***	0.288***
	(-3.205)	(24.963)
Firm size	0.084***	-0.005
	(13.107)	(-0.908)
MTB	-0.000	-0.001*
	(-0.183)	(-1.656)
Leverage	-0.129***	0.270***
	(-3.764)	(8.707)
Profitability	0.467***	-0.587***
	(4.636)	(-6.444)
Tangibility	0.121**	0.087**
	(2.572)	(2.368)
CFO volatility	0.695***	0.095
	(3.471)	(0.375)
Z-score	-0.027***	-0.042***
	(-4.749)	(-7.643)
Rated	0.045***	-0.072***
	(2.986)	(-6.084)
Constant	-0.568***	5.733***
	(-6.943)	(59.336)
Loan purpose FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	13,391	13,391
Adjusted R-squared	0.768	0.525
Over-identifying restriction test	χ^2=2.050 (p=0.152)	

ENDOGENEITY CONTROLS: ENTROPY BALANCING

- Apply **entropy balancing** for **borrowers with** and **without** analyst **capex forecasts** (*CPXAF*).

- This approach generates **well-balanced samples** where borrowers with and without analyst capex forecasts are **not significantly different** on **observable firm characteristics.**

Table 4. Analysts' capex forecasts and loan pricing: Entropy-balanced sample regression

	Loan spread	
	(1)	(2)
CPXAF	-0.074***	
	(-4.571)	
N_CPXAF		-0.043***
		(-4.072)
N_EPSAF	-0.024	-0.003
	(-0.599)	(-0.070)
CPXGD	0.016	0.015
	(1.028)	(1.002)
Revolver	-0.175***	-0.174***
	(-14.948)	(-14.972)
Loan size	-0.081***	-0.080***
	(-11.832)	(-11.844)
Financial covenants	-0.052***	-0.052***
	(-6.525)	(-6.537)
Capex covenant	0.007	0.006
	(0.233)	(0.205)
Maturity	0.082***	0.082***
	(5.550)	(5.516)
N_Lenders	-0.057***	-0.058***
	(-5.845)	(-5.836)
PP	-0.076***	-0.076***
	(-4.718)	(-4.654)
Collateral	0.297***	0.297***
	(18.568)	(18.507)
Firm size	-0.033***	-0.029***
	(-4.535)	(-3.913)
MTB	-0.000	-0.000
	(-0.263)	(-0.239)
Leverage	0.311***	0.312***
	(6.400)	(6.375)
Profitability	-0.688***	-0.658***
	(-4.416)	(-4.139)
Tangibility	0.043	0.044
	(0.805)	(0.826)
CFO volatility	0.067	0.074
	(0.210)	(0.235)
Z-score	-0.038***	-0.039***
	(-4.447)	(-4.530)
Rated	-0.059***	-0.058***
	(-3.412)	(-3.352)
Constant	5.991***	5.935***
	(56.275)	(56.814)
Loan purpose FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	13,391	13,391
Adjusted R-squared	0.523	0.522

ROBUSTNESS ANALYSIS

To further validate that our **main results** are **not driven** by **other sources** of **information** available to lenders (i.e., **other** than **analyst capex forecasts**), we perform several robustness tests.

1) Although we control for analyst earnings forecasts in all our analyses, it might be possible that the effect of analyst capex forecasts on loan spreads is influenced by the **effect** of **analyst earnings forecasts** on **loan spreads**.

- scale the number of analyst capex forecasts by the number of analyst earnings forecasts (*N_CPXAF* over *N_EPSAF*).

➢ If analyst **capex forecasts** is an **important source** of information for **lenders,** this ratio should be **negatively associated** with **loan spreads**.

➢ Regress **loan spreads** on ***N_CPXAF* over *N_EPSAF*** along with the controls used in the baseline model.

ROBUSTNESS ANALYSIS (I)

2) Although we control for **management capex forecasts** in all our analyses, it might be possible that these forecasts drive the relation between analyst capex forecasts and loan spreads.

- we **exclude** from our sample all **borrowers** that issue **management capex forecasts**.

3) Although we control for **credit ratings** in all our analyses, it could be the case that lenders use **information** provided by **sell-side debt analysts** and this drives the relation between analyst capex forecasts and loan spreads.

- we **exclude** all **borrowers** with **credit ratings** from our sample.

ROBUSTNESS ANALYSIS (II)

4) Firms may borrow from banks not to fund their capex investment, but for other **unrelated reasons**, e.g., to address their **working capital needs**.

⟶ analyst **capex forecasts** might **not** be **directly useful** for lenders when deciding on loan spreads for their borrowers.

- **exclude** all loans whose primary **purpose** is to serve **working capital needs** from our sample.

5) Analyst capex forecasts may not be so useful for lenders when they are issued for **new economy firms**.

⟶ they tend to **invest** more intensively in **intangible**, rather than tangible, assets, potentially making analyst capex forecasts less useful for lenders (Murphy, 2003).

- **exclude** from our sample all **new economy firms**, i.e., companies with relevant primary SIC codes.

Table 5. Analysts' capex forecasts and loan pricing: Robustness tests

	Loan spread				
	(1)	(2)	(3)	(4)	(5)
N_CPXAF over N_EPSAF	-0.066***				
	(-2.689)				
N_CPXAF		-0.052***	-0.053***	-0.049***	-0.064***
		(-4.696)	(-4.382)	(-5.398)	(-6.880)
N_EPSAF		-0.025*	-0.020	-0.026**	-0.037***
		(-1.789)	(-1.502)	(-2.303)	(-2.904)
CPXGD	-0.013		-0.025*	-0.015	-0.001
	(-1.312)		(-1.900)	(-1.353)	(-0.062)
Revolver	-0.208***	-0.227***	-0.247***	-0.249***	-0.208***
	(-26.527)	(-20.884)	(-22.999)	(-31.028)	(-24.313)
Loan size	-0.083***	-0.084***	-0.091***	-0.083***	-0.081***
	(-16.371)	(-12.903)	(-14.722)	(-15.761)	(-15.647)
Financial covenants	-0.054***	-0.061***	-0.062***	-0.061***	-0.053***
	(-9.863)	(-8.444)	(-8.793)	(-10.521)	(-9.116)
Capex covenant	0.070***	0.091***	0.079***	0.052**	0.077***
	(2.719)	(3.044)	(2.843)	(2.412)	(2.769)
Maturity	0.080***	0.085***	0.070***	0.081***	0.076***
	(7.568)	(6.320)	(4.609)	(7.771)	(6.725)
N_Lenders	-0.040***	-0.040***	-0.045***	-0.042***	-0.044***
	(-5.634)	(-4.188)	(-4.975)	(-5.702)	(-5.683)
PP	-0.097***	-0.101***	-0.120***	-0.082***	-0.091***
	(-8.591)	(-6.457)	(-7.717)	(-7.259)	(-7.639)
Collateral	0.293***	0.293***	0.280***	0.303***	0.284***
	(25.417)	(18.805)	(18.935)	(24.499)	(22.914)
Firm size	-0.013***	-0.004	0.022***	-0.011**	-0.004
	(-2.614)	(-0.620)	(3.949)	(-2.155)	(-0.830)
MTB	-0.001*	-0.002**	-0.002**	-0.001	-0.001
	(-1.656)	(-2.022)	(-2.513)	(-1.179)	(-1.426)
Leverage	0.283***	0.221***	0.265***	0.230***	0.270***
	(9.092)	(5.617)	(7.035)	(7.176)	(8.285)
Profitability	-0.636***	-0.519***	-0.438***	-0.544***	-0.659***
	(-6.956)	(-4.851)	(-4.348)	(-5.564)	(-6.624)
Tangibility	0.085**	0.078*	0.073	0.057	0.042
	(2.330)	(1.664)	(1.581)	(1.549)	(1.181)
CFO volatility	0.077	0.094	0.382	-0.263	0.156
	(0.302)	(0.292)	(1.218)	(-0.924)	(0.551)
Z-score	-0.041***	-0.046***	-0.045***	-0.047***	-0.039***
	(-7.438)	(-7.067)	(-7.024)	(-7.755)	(-6.095)
Rated	-0.080***	-0.095***		-0.076***	-0.083***
	(-6.762)	(-5.507)		(-6.157)	(-6.551)
Constant	5.782***	5.664***	5.717***	5.721***	5.761***
	(59.816)	(44.199)	(56.345)	(58.511)	(58.003)
Loan purpose FE	Yes	Yes	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	13,391	7,253	8,210	12,013	11,607
Adjusted R-squared	0.522	0.524	0.472	0.521	0.530

CHANNEL ANALYSIS - ANALYST EXPERTISE

1) Based on the expectation that analyst **capex forecasts** should function as an **expert** and **independent estimate** of anticipated firms' **growth potential**, we examine whether our results are **stronger** when **analysts** are **more competent** and **experienced**.

- repeat our analysis for forecasts by analysts with **greater experience** on the **firm,** greater **industry expertise**, and analysts with who have provided **more accurate forecasts** in the past.

- Analysts with a high level of **firm-specific experience** can **better recognize economic trends** and understand the **idiosyncrasies** of a particular firm's **reporting practices** (Kim et al., 2019).

- Analysts with **greater industry knowledge** are expected to more thoroughly **analyze** the firm's **operating environment**, its supply chain partners, competitors, and overall industry (Choi et al., 2020).

- The **accuracy** of analyst forecasts should **increase** the **usefulness** of analyst forecasts to **accounting information users** (Clement and Tse, 2003).

Table 6. Analysts' capex forecasts and loan pricing: Analyst expertise channel

		Loan spread		
		Firm experience	*Industry knowledge*	*Forecast accuracy*
		(1)	(2)	(3)
High expertise	(1)	-0.096***	-0.098***	-0.105***
		(-5.317)	(-4.924)	(-5.604)
Low expertise	(2)	-0.067***	-0.067***	-0.075***
		(-4.857)	(-4.800)	(-4.962)
N_EPSAF		-0.035***	-0.034***	-0.037***
		(-2.844)	(-2.761)	(-3.036)
CPXGD		-0.001	-0.002	0.004
		(-0.124)	(-0.228)	(0.375)
Revolver		-0.207***	-0.207***	-0.212***
		(-26.378)	(-26.361)	(-25.137)
Loan size		-0.083***	-0.083***	-0.081***
		(-16.400)	(-16.383)	(-15.035)
Financial covenants		-0.053***	-0.053***	-0.055***
		(-9.765)	(-9.755)	(-9.477)
Capex covenant		0.067***	0.068***	0.074***
		(2.661)	(2.680)	(2.682)
Maturity		0.080***	0.080***	0.083***
		(7.599)	(7.633)	(7.632)
N_Lenders		-0.040***	-0.040***	-0.038***
		(-5.692)	(-5.693)	(-4.997)
PP		-0.096***	-0.096***	-0.094***
		(-8.552)	(-8.604)	(-7.799)
Collateral		0.290***	0.290***	0.289***
		(25.018)	(25.146)	(22.899)
Firm size		-0.011**	-0.009*	-0.010*
		(-2.142)	(-1.885)	(-1.951)
MTB		-0.001*	-0.001*	-0.001**
		(-1.707)	(-1.749)	(-1.964)
Leverage		0.275***	0.273***	0.265***
		(8.913)	(8.820)	(8.112)
Profitability		-0.617***	-0.609***	-0.617***
		(-6.809)	(-6.704)	(-6.582)
Tangibility		0.083**	0.083**	0.082**
		(2.280)	(2.273)	(2.082)
CFO volatility		0.051	0.060	0.002
		(0.199)	(0.235)	(0.008)
Z-score		-0.040***	-0.040***	-0.040***
		(-7.251)	(-7.340)	(-7.028)
Rated		-0.075***	-0.077***	-0.075***
		(-6.272)	(-6.479)	(-5.840)
Constant		5.782***	5.773***	5.739***
		(59.142)	(58.900)	(51.253)
Loan purpose FE		Yes	Yes	Yes
Industry FE		Yes	Yes	Yes
Year FE		Yes	Yes	Yes
Observations		13,391	13,391	11,594
Adjusted R-squared		0.524	0.524	0.532
p-value for the coefficient difference between (1) and (2)		0.048	0.096	0.062

CHANNEL ANALYSIS - BORROWER INFORMATION ASYMMETRY

2) Channel consistent with analyst **capex forecasts mitigating moral hazard** and **agency considerations** which typically **increase** the **cost** of **bank debt**.

- Anticipate that our findings should be stronger when **moral hazard** and **agency considerations** are also stronger.
- Use **two proxies** for the strength of possible **information asymmetries** and **agency considerations**.
- Expect that **information asymmetry problems** should be **higher** for firms **more able** to **finance** their **growth** through **internally generated cash flow** (i.e., firms **less dependent** on **external financing** to raise capital).
- **Information asymmetry** should also be **greater** for firms with **more complex operations**, which is the case for firms extending their **operations** across **multiple operating segments**.

Table 7. Analysts' capex forecasts and loan pricing: Borrower information asymmetry channel

	Loan spread	
	Financing dependence	*Firm complexity*
	(1)	(2)
N_CPXAF	-0.043***	-0.030**
	(-4.564)	(-2.367)
Asymmetry	0.006***	0.028***
	(2.971)	(2.880)
N_CPXAF × Asymmetry	-0.005***	-0.020**
	(-2.914)	(-2.289)
N_EPSAF	-0.028**	-0.028**
	(-2.471)	(-2.444)
CPXGD	-0.006	-0.002
	(-0.556)	(-0.217)
Revolver	-0.208***	-0.206***
	(-26.076)	(-26.173)
Loan size	-0.079***	-0.081***
	(-15.480)	(-16.005)
Financial covenants	-0.056***	-0.052***
	(-10.077)	(-9.655)
Capex covenant	0.068***	0.070***
	(2.667)	(2.701)
Maturity	0.072***	0.084***
	(6.609)	(7.990)
N_Lenders	-0.043***	-0.042***
	(-5.961)	(-5.881)
PP	-0.096***	-0.092***
	(-8.254)	(-8.215)
Collateral	0.281***	0.280***
	(23.574)	(23.576)
Firm size	-0.003	-0.011**
	(-0.671)	(-2.145)
MTB	-0.001	-0.001
	(-1.169)	(-1.113)
Leverage	0.266***	0.291***
	(8.265)	(8.990)
Profitability	-0.635***	-0.632***
	(-6.598)	(-6.645)
Tangibility	0.102***	0.098***
	(2.702)	(2.695)
CFO volatility	0.275	0.231
	(1.044)	(0.835)
Z-score	-0.045***	-0.046***
	(-8.134)	(-8.081)
Rated	-0.073***	-0.073***
	(-5.958)	(-6.056)
Constant	5.739***	5.699***
	(58.737)	(57.313)
Loan purpose FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	12,727	13,187
Adjusted R-squared	0.518	0.523

CHANNEL ANALYSIS - LENDER EXPERTISE AND SOPHISTICATION

3) Focus on **lead-borrower** or **lead-participant** relationship in a loan, and **lender experience** in providing **financing** to the **industry** where the borrower belongs.

- **Lead lenders** with existing **working relationships** with the **borrower** may need to **rely less** on **independent analyst data** to decide upon lending **terms**: their lending **relationship enables** lenders to **better assess borrower risk** and tailor loan terms accordingly (Banerjee et al., 2021).

- When the **lead bank** and other **members** of the **syndicate** (participant lenders) have had **existing lending relationships**, **information asymmetry** and **agency** costs **among syndicate members** are **reduced** (Bushman et al., 2017; Call et al., 2022).

- The **lead lender** may have **less need** to use **independent analyst data** to **explain** debt contracting **terms** to **other participant lenders**.

- **Lenders' reliance** on **analyst forecasts** when **evaluating loan pricing** is likely to be significantly **lower** when they possess **industry expertise** in financing firms from the **same sector.**

Table 8. Analysts' capex forecasts and loan pricing: Lender expertise and sophistication channel

	Loan spread		
	Lead-Borrower relation	*Lead-Participant relation*	*Lender industry expertise*
	(1)	(2)	(3)
N_CPXAF	-0.065***	-0.070***	-0.072***
	(-5.907)	(-5.027)	(-6.361)
Lender	-0.053***	-0.761***	-0.040***
	(-3.586)	(-6.204)	(-2.604)
N_CPXAF × Lender	0.026**	0.256**	0.038***
	(2.161)	(2.436)	(3.055)
N_EPSAF	-0.029***	-0.020*	-0.031***
	(-2.631)	(-1.795)	(-2.633)
CPXGD	-0.005	-0.008	-0.008
	(-0.436)	(-0.747)	(-0.766)
Revolver	-0.207***	-0.182***	-0.210***
	(-26.420)	(-22.639)	(-25.914)
Loan size	-0.083***	-0.081***	-0.082***
	(-16.567)	(-14.494)	(-16.249)
Financial covenants	-0.052***	-0.047***	-0.053***
	(-9.549)	(-8.420)	(-9.409)
Capex covenant	0.069***	0.070***	0.075***
	(2.735)	(2.899)	(2.884)
Maturity	0.078***	0.072***	0.086***
	(7.507)	(6.387)	(7.929)
N_Lenders	-0.038***	-0.041***	-0.042***
	(-5.377)	(-4.526)	(-5.793)
PP	-0.099***	-0.082***	-0.092***
	(-8.760)	(-7.114)	(-8.022)
Collateral	0.293***	0.279***	0.288***
	(25.218)	(23.180)	(24.091)
Firm size	-0.006	-0.015***	-0.007
	(-1.274)	(-2.648)	(-1.275)
MTB	-0.001	-0.001	-0.001*
	(-1.605)	(-1.062)	(-1.756)
Leverage	0.277***	0.278***	0.254***
	(8.926)	(8.287)	(7.850)
Profitability	-0.624***	-0.568***	-0.594***
	(-6.891)	(-5.767)	(-6.365)
Tangibility	0.088**	0.068*	0.089**
	(2.366)	(1.895)	(2.325)
CFO volatility	0.089	-0.136	0.056
	(0.349)	(-0.463)	(0.210)
Z-score	-0.039***	-0.042***	-0.041***
	(-7.141)	(-6.799)	(-7.238)
Rated	-0.074***	-0.063***	-0.069***
	(-6.171)	(-4.973)	(-5.616)
Constant	5.764***	5.900***	5.762***
	(59.262)	(61.975)	(58.700)
Loan purpose FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	13,280	10,875	12,470
Adjusted R-squared	0.528	0.532	0.526

ADDITIONAL ANALYSIS - NON-PRICE LOAN TERMS

- We further examine whether analyst capex forecasts are associated with **non-price loan contract terms**.
- In addition to loan pricing, lenders may use various **non-price loan contract** terms to **monitor** their **borrowers**.
- **Collateral requirements** and **covenant restrictions** play a significant role as **monitoring mechanisms** (e.g., Balachandran et al., 2019; Dechow and Dichev, 2002).
- Examine whether **analyst capex forecasts** affect the **probability** of **lenders** to include requirements for **collateral** or **covenant restrictions** in debt contracts.
- To the extent that **analyst capex forecasts** provide **useful information** to **lenders**, there may be **less need** to include **collateral requirements** and **covenant restrictions**.

Table 9. Analysts' capex forecasts and non-pricing loan terms: Collateral and Capex Covenants

	Collateral	*Capex covenants*
	(1)	(2)
N_CPXAF	-0.080**	-0.123*
	(-2.402)	(-1.900)
N_EPSAF	-0.031	-0.034
	(-0.806)	(-0.577)
CPXGD	0.023	0.086
	(0.563)	(1.203)
Revolver	0.034	0.102**
	(1.264)	(2.558)
Loan size	0.161***	-0.025
	(9.129)	(-1.095)
Financial covenants	0.273***	0.554***
	(12.504)	(16.679)
Capex covenant	0.844***	
	(9.301)	
Maturity	0.425***	-0.252***
	(11.807)	(-4.439)
N_Lenders	-0.312***	-0.023
	(-11.258)	(-0.581)
PP	0.105**	-0.067
	(2.443)	(-1.081)
Collateral		0.705***
		(9.210)
Loan spread	1.187***	0.334***
	(23.352)	(4.571)
Firm size	-0.045**	-0.139***
	(-2.467)	(-4.395)
MTB	0.002	-0.003
	(0.885)	(-0.753)
Leverage	1.194***	0.457***
	(9.879)	(2.631)
Profitability	-0.698**	-0.103
	(-2.120)	(-0.213)
Tangibility	-0.301**	-0.115
	(-2.242)	(-0.519)
CFO volatility	-2.483**	-0.971
	(-2.435)	(-0.815)
Z-score	-0.036	0.011
	(-1.591)	(0.342)
Rated	-0.190***	-0.105
	(-3.937)	(-1.224)
Constant	-7.928***	-2.012**
	(-16.992)	(-2.493)
Loan purpose FE	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	13,391	13,109
Pseudo R^2	0.296	0.370

CONCLUSION

- ✓ This study provides **new evidence** on a potential role **for analysts' capex forecasts** in shaping the **terms** of **bank debt contracting**.

- ✓ We find a **robust negative** and **economically significant association** between the number of **analyst capex forecasts** and **loan spreads**, suggesting that **lenders** view analyst **capex forecasts** as **credible** and **incrementally informative signals** of firms' **investment plans** and **growth potential**.

- show that analyst **capex forecasts** serve as an **external signal** to **lenders**, **reducing information asymmetry** and **agency concerns**, ultimately seemingly affecting the **pricing** and **structure** of **bank loans**.

- ✓ The **effect** of analyst **capex forecasts** on **loan pricing** is **stronger** when analysts are more experienced, possess greater industry expertise, or have a track record of accurate forecasting, and when firms have weaker information environments. The results are weaker when lenders have a track record of lead-borrower or lead-participant relationships, and greater experience in granting loans to firms from the borrower's sector.

CONCLUSION (I)

- Findings support the notion that **analyst forecasts** are **not homogeneous** in **quality** and that **lenders** are able to **discern** and **respond** to **differences** in analyst **credibility**.

- Findings **consistent** with the idea that **analyst forecasts** are particularly **valuable** in settings where **internal firm information** is **less transparent** or **more difficult** to **interpret**.

- Lenders with more **industry experience** and **borrower information** need to **rely less** on analyst capex forecasts for **insights** in their **loan pricing decisions**.

Beyond loan pricing, we also document that **analyst capex forecasts** are associated with **more favorable non-price loan terms**.

- Firms with **greater** analyst **capex forecast coverage** are **less likely** to face **collateral requirements** and are less likely to have **capex-related covenants**.

- analyst forecasts **not only reduce** the **cost** of borrowing but also **ease** other **contractual frictions** in the lending process.

CONCLUSION - CONTRIBUTION

✓ We contribute to the emerging research on the **economic impact** of analyst **capex forecasts**.

Our results suggest that **analyst capex forecasts** not only **help** firms invest **more efficiently** (Choi et al., 2020) but also **help** them **secure funding** at **better rates**, with **less collateral**, and **fewer covenants**:

⟶ A **firm's outsiders** can ultimately provide **decision-relevant information** to a **firm's insiders,** considering the **proprietary access** of **banks** to their borrowers' books.

✓ We contribute to research on the **impact** of analysts' **forecasts** on **debt** (rather than equity) **markets** and **debt contracting.**

- provide initial **evidence** on how a relatively **underexplored** analyst forecast measure - **capex forecasts-** can influence **debt market outcomes**.
- findings underscore the **broader economic significance** of analyst forecasts beyond **earnings** and **equity markets**.

CONCLUSION - CONTRIBUTION (I)

✓ We contribute to research on **bank loan pricing terms** and **conditions**, by showing that analyst **capex forecasts**, in addition to other **analyst-generated information** or **forecasts**, can **significantly** affect the **terms** of **bank financing**.

- Identify **capex forecasts** as a **novel** and **economically significant input** into the **loan pricing process** and provide new **insights** into how **external** information sources can **shape** the behavior of **financial intermediaries**.

⟶ Implications for **firms** seeking to **improve** their **financing conditions**, as well as for **regulators** and **standard-setters** interested in **understanding** the **broader consequences** of **financial disclosure** and **analyst activity**.