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Article

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FINANCIAL ECONOMICS | LETTER

The effects of reporting standards and information sharing on loan contracting: Cross-country evidence

Balagopal Gopalakrishnan¹ and Sanket Mohapatra^{2*}

Abstract: Institutional factors that enhance the quality of financial reporting and sharing of credit information can alleviate informational gaps between contracting parties and improve loan contract terms. Using cross-country data on syndicated loans, we find that the cost of debt financing is lower for riskier borrowers in countries with stronger reporting standards and improved credit information sharing. We also find that information quality is more important as compared to information sharing for loan pricing. Both of these effects are larger during periods of higher economic policy uncertainty when information asymmetry is likely to be higher. Our findings suggest that better availability of hard information plays a positive role in reducing borrowing costs of riskier firms.

Subjects: Macroeconomics; Corporate Finance; Banking

Keywords: syndicated loans; reporting standards; information sharing; economic policy uncertainty

Subjects: D82; G20; G21; F34

1. Introduction

Information asymmetries are a major source of financial frictions in bank lending. Asymmetric information between borrowers and lenders can result in adverse selection and moral hazard, leading to credit rationing (Jaffee & Russell, 1976; Stiglitz & Weiss, 1981).¹ Karaibrahimoglu and Cangarli (2016) argue that reliable financial reporting can reduce information asymmetry and mitigate agency problems among stakeholders. Institutional measures that enhance the sharing of credit information could alleviate informational gaps between lenders and borrowers (Djankov, McLiesh, & Shleifer, 2007), which can improve loan contract terms. In a cross-country setting, we test the hypothesis that higher information quality and improved credit information sharing reduce

PUBLIC INTEREST STATEMENT

This work contributes to ongoing and future research on the micro implications of macro policies, institutional factors, and banking regulations being carried out at the Indian Institutes of Management. The research on macro-micro linkages uses large firm-level and bank-level datasets across developed and developing countries to analyze the implications of macroeconomic and regulatory factors for firms and banks. These include, for example, the effect of Basel banking norms on firms' capital structure and investment strategies, and the implication of reporting standard, disclosure norms, and credit information for firm behavior in advanced and emerging market economies. These studies exploit the cross-sectional heterogeneity in micro-level responses to institutional and regulatory changes, particularly during times of economic policy uncertainty. Our research contributes to a better understanding of institutional factors and associated interplay among agents in financial contracting.

borrowing costs for riskier borrowers, particularly during periods of higher economic policy uncertainties.

Consistent with the role of public information in mitigating informational frictions, we find that the impact of higher firm risk on syndicated loan spreads is moderated in countries with stronger auditing and reporting standards, a measure of the quality of information. A smaller moderating effect is observed for the country-level depth of credit information, a measure of information sharing. We also find that these moderating effects are higher during heightened economic policy uncertainty, which is consistent with the argument that information asymmetry is more pronounced during uncertain times (Nagar, Schoenfeld, & Wellman, 2019). Our findings are robust to alternative specifications, exclusion of global financial crisis years, restricted sample of US dollar loans, and a subsample of non-US firms.

Extant literature has considered the role of information quality and information sharing in financial contracting and investment efficiency. In a cross-country study, Biddle and Hilary (2006) show that accounting quality improves investment efficiency by reducing information asymmetry between borrowers and lenders. Ertugrul, Lei, Qiu, and Wan (2017) show that poor readability and ambiguity of annual reports have an adverse impact on borrowing costs of firms in the United States. Djankov et al. (2007) show that information sharing through public credit registries has a positive impact on credit flows to the private sector in developing countries. Brown, Jappelli, and Pagano (2009) find that information sharing reduces the cost of credit, especially for opaque firms, in transition countries. We complement these studies by comparing the effects of country-level quality and sharing of information in loan contract terms of firms in both advanced and emerging economies.

Several studies have found that economic policy uncertainty influences information asymmetry and real sector outcomes. Nagar et al. (2019) find that information asymmetry, represented by higher bid-ask spreads and muted stock price reactions to earnings announcements, increases during higher economic policy uncertainty. Baker, Bloom, and Davis (2016) show that economic policy uncertainty is related to adverse real-sector outcomes such as lower investment, output, and employment. Pastor and Veronesi (2012) argue that higher policy uncertainty causes a larger decline in stock prices during government policy changes. Drawing on this literature, we conjecture that information quality and sharing play a larger role in mitigating information asymmetries in loan contracting during higher economic policy uncertainty.

The use of loan-level data allows us to control for a range of loan-specific features as well as syndicate structure. Moreover, the use of micro-level data mitigates the potential endogeneity of our key explanatory variables as the spread on individual bank loans is not likely to influence the country-level indices of information quality and availability. Additionally, we test the validity of our findings to the exclusion of loan-specific control variables that may be simultaneously determined along with loan spreads, following the approach of Fotak, Lee, and Megginson (2019). Further, we account for time-varying (observed and unobserved) factors that may influence loan pricing at the country-level by including country-year-interacted fixed effects along with firm and year fixed effects in all regressions (Gormley & Matsa, 2014).

This study contributes to the literature on information asymmetry and financial contracting in several ways. First, to our knowledge, this is the first study to empirically assess the association between economic policy uncertainty and information asymmetry for credit markets. We show that during periods of higher economic policy uncertainty, enhanced information quality and sharing help banks reduce their loan spreads. Our results from the syndicated loan markets for a large number of countries complement the findings of Nagar et al. (2019) for the equity market in the United States. Second, while the role of information sharing and information availability has been studied in isolation, our study compares their relative importance for loan contracting. Third, our findings on the impact of information sharing on syndicated loan spreads of riskier firms for

advanced and emerging market economies across regions complement the findings for specific regions (Brown et al., 2009). These aspects help fill gaps in the empirical literature on the role of information in reducing financing frictions.

The next section discusses the data used for this study. The subsequent sections discuss the methodology, results, and robustness of our findings. The last section concludes with the relevance of the findings for the literature on loan contracting and policy.

2. Data

Our sample includes annual panel data on syndicated bank loans across 35 advanced and emerging economies obtained from the DealScan database of Loan Pricing Corporation. We include only hard currency loans obtained by non-financial firms.² These loans are aggregated at an annual frequency by cumulating tranche level loan amounts at the firm-year level. The key dependent variable is the weighted average loan spread over the LIBOR benchmark interest rate, with loan tranche amounts used as weights.

We employ two country-level institutional proxies to examine the role of information in financial contracts. Our measure of the quality of information is the strength of auditing and reporting standards obtained from the *Global Competitiveness Report* database of the World Economic Forum (Karaibrahimoglu & Cangarli, 2016). This index takes on values from 1 to 7, with higher values representing better quality of “hard information” available to lenders. The measure of information sharing is the depth of credit information index obtained from the *Doing Business* database of the World Bank (Djankov et al., 2007). It quantifies the strength of rules that govern the accessibility and span of credit bureaus and registries in a country and ranges from 0 to 8, with 0 being the lowest and 8 the highest level of credit information sharing. The country-level data on reporting standards and information sharing are available from 2007 and 2006, respectively. The final sample comprises 8,127 firm-year observations for 2,785 unique firms from 2006 until 2017.

The choice of loan-level variables and syndicate structure is based on previous studies on syndicated loans (Giannetti & Yafeh, 2012; Sufi, 2007). Loan-level variables include the logarithm of loan amount, loan maturity, and dummy variables for whether the loan is secured, has covenants, and is in foreign currency. The riskiness of the firm, *Firm_risk*, is captured by the numeric equivalent of the average long-term issuer credit rating, which takes on values between 1 and 22, where 1 refers to AAA rated and 22 refers to D rated entities. Variables that represent syndicate structure include the number of lenders, presence of foreign banks, and lead bank characteristics such as the logarithm of total assets and net interest margin. The lead bank controls are obtained by matching the names of the lead arranger banks from the loan-level DealScan dataset with Moody’s Analytics BankFocus database on bank-level financial information.

The definitions and descriptive statistics of the key variables used in the study are detailed in Tables 1 and 2, respectively. The average firm had an annual loan amount of about 757 million US dollars, spread of about 233 bps over LIBOR, and loan tenor of 54 months. On average, 60% of the firms in the sample are in the speculative-grade category. The average firm risk is 11.6, corresponding to a BB letter rating.

3. Methodology and results

3.1. Effect of information quality and sharing on loan spreads

We employ the following empirical model to examine the effect of information quality on loan spreads:

Table 1. Variables description

Variables	Definition and construction
<i>Loan_spread</i> (bps)	The weighted average spread (with loan amount as weights) of all loans taken by a firm in a year (<i>All in spread drawn</i>)
<i>Secured</i>	Dummy variable that takes the value 1 if the deal is secured by any collateral and 0 otherwise
<i>Covenants</i>	Dummy variable that takes the value 1 if the deal has any covenants and 0 otherwise
<i>Log_amount</i>	The logarithm of the aggregate loans (sum of all loans in millions of US dollar) obtained by a firm in a year
<i>Log_maturity</i>	The logarithm of the weighted average maturity (with loan amount as weights) of all loans taken during a year by a firm
<i>Num_lenders</i>	Total number of participating lenders in the syndicate
<i>Foreign_bank</i>	Dummy variable that takes the value 1 if there is atleast one foreign bank participant in the syndicate and 0 if it comprises exclusively of domestic banks. This dummy variable is constructed by matching the lender operating country with the borrower firm's country of domicile.
<i>Leadbank_asset</i>	The logarithm of the average total assets (in millions USD) of the lead banks in the syndicate. The simple average is used as the majority of loans in the DealScan database do not have proportional shares of lead banks. Bank name based match is done with Moody's Analytics BankFocus database and the DealScan database.
<i>Leadbank_NIM</i>	The average net interest margin (NIM) of the lead banks in the syndicate. A similar matching approach employed for <i>Leadbank_asset</i> is used to compute the average NIM.
<i>Firm_risk</i>	The weighted average of the numeric equivalent of firm ratings (with loan amount as weights) for all loans taken by a firm in a year. We use an ordinal rating scale, where 1 refers to AAA rating and 22 refers to D rating. The rating for each loan is the average of the <i>Long-term Issuer ratings</i> provided by S&P, Moody's and Fitch.
<i>Spec_dum</i>	Dummy variable that takes the value 1 if the rating corresponds to speculative grade (BB- or lower) category and 0 otherwise
<i>ReportingStd</i>	Index of strength of financial auditing and reporting standards, with a score ranging from 1 to 7 obtained from the Global Competitiveness database of the World Economic Forum. A measure of the quality of hard information in a country.
<i>DepthCreditInfo</i>	Index measuring rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry, with a score ranging from 0 to 8 obtained from World Bank Doing business rankings. A measure of the extent of information sharing in a country.
EPC	Economic policy uncertainty index obtained from the database maintained by Baker et al. (2016)

$$\begin{aligned}
 \text{Loan_spread}_{ijt} = & \beta_0 + \beta_1 \text{Firm_risk}_{ijt} + \beta_2 (\text{Firm_risk}_{ijt} \times \text{QSI}_{jt}) \\
 & + \gamma \mathbf{X}_{ijt} + \mu_i + \tau_t + (\rho_j \times \tau_t) + \epsilon_{ijt}
 \end{aligned}
 \tag{1}$$

where *Loan_Spread_{ijt}* is the weighted average spread for all the loans availed by the firm *i* in country *j* in the year *t*. *Firm_risk* refers to a measure of a firm's credit risk. The quality and sharing of information (*QSI*) represents either (a) the level of information quality, which is proxied by country-level strength of auditing and reporting standards index (*ReportingStd*); or (b) information sharing, which is proxied by the depth of credit information index (*DepthCreditInfo*). The explanatory variable of interest is the interaction of *Firm_risk* × *QSI*. A negative sign of β_2 would reflect the extent to which better information quality and sharing mitigate the effect of higher screening and monitoring costs for riskier firms. *X* is a set of loan-specific features, syndicate structure, and lead bank controls. We employ a panel fixed effects model to control for time invariant firm-specific effects and include time dummies to account for year-specific effects. We also control for the *country-year* unobserved effects ($\rho_j \times \tau_t$), which capture any country-specific time-varying factors that affect loan spreads. This would also subsume *DepthCreditInfo* and *ReportingStd* in the regression analysis.

Table 2. Descriptive statistics

Variable	Obs.	Mean	Std. Dev	Median	P10	P90	Min	Max
All firms								
Loan-specific								
<i>Loan_spread</i>	8,127	232.66	155.64	195.00	75.00	450.00	7.00	1225.00
<i>Secured</i>	8,127	0.50	0.50	0.00	0.00	1.00	0.00	1.00
<i>Covenants</i>	8,127	0.42	0.49	0.00	0.00	1.00	0.00	1.00
<i>Log_amount</i>	8,127	6.63	1.17	6.62	5.19	8.11	1.95	11.34
<i>Log_maturity</i>	8,127	3.99	0.38	4.11	3.58	4.36	2.48	6.58
Syndicate structure								
<i>Num_lenders</i>	8,127	9.20	7.31	7.00	2.00	19.00	1.00	94.00
<i>Foreign_bank</i>	8,127	0.83	0.38	1.00	0.00	1.00	0.00	1.00
<i>Leadbank_asset</i>	8,127	14.12	0.61	14.27	13.60	14.59	8.68	15.06
<i>Leadbank_NIM</i>	8,127	2.26	0.86	2.21	1.20	3.25	-1.81	8.21
Firm-specific								
<i>Firm_risk</i>	8,127	11.60	3.19	12.00	7.00	15.00	1.00	22.00
<i>Spec_dum</i>	8,127	0.60	0.49	1.00	0.00	1.00	0.00	1.00
Country-specific								
<i>DepthCreditInfo</i>	8,127	6.48	1.10	6.00	6.00	8.00	0.00	8.00
<i>ReportingStd</i>	7,491	5.50	0.37	5.45	5.19	5.87	3.66	6.73
<i>EPU</i>	8,032	129.14	37.42	139.38	79.71	157.98	27.00	364.83
Non-US firms								
Loan-specific								
<i>Loan_spread</i>	1,014	207.19	146.26	175.00	55.00	411.80	7.00	900.00
<i>Secured</i>	1,014	0.32	0.47	0.00	0.00	1.00	0.00	1.00
<i>Covenants</i>	1,014	0.13	0.34	0.00	0.00	1.00	0.00	1.00

(Continued)

Table 2. (Continued)

Variable	Obs.	Mean	Std. Dev	Median	P10	P90	Min	Max
<i>Log_amount</i>	1,014	6.91	1.26	6.91	5.30	8.51	2.71	10.92
<i>Log_maturity</i>	1,014	3.90	0.43	4.08	3.36	4.33	2.48	6.58
Syndicate structure								
<i>Num_lenders</i>	1,014	10.86	9.52	8.00	3.00	21.00	1.00	94.00
<i>Foreign_bank</i>	1,014	0.97	0.16	1.00	1.00	1.00	0.00	1.00
<i>Leadbank_asset</i>	1,014	14.06	0.63	14.23	13.56	14.55	10.38	15.06
<i>Leadbank_NIM</i>	1,014	1.81	0.71	1.69	0.99	2.82	0.06	6.60
Firm-specific								
<i>Firm_risk</i>	1,014	10.65	3.07	10.00	7.00	15.00	3.00	22.00
<i>Spec_dum</i>	1,014	0.48	0.50	0.00	0.00	1.00	0.00	1.00
Country-specific								
<i>DepthCredInfo</i>	1,014	5.73	1.80	6.00	4.00	8.00	0.00	8.00
<i>ReportingStd</i>	957	5.63	0.71	5.93	4.53	6.31	3.66	6.73
<i>EPU</i>	919	159.27	64.59	151.81	73.98	243.62	27.00	364.83

The results are shown in columns (1) and (2) of Table 3. The coefficient of the interaction term $Firm_risk \times ReportingStd$ in column (1) indicates that a one standard deviation increase in firm risk (equivalent to a 3.2 notches downgrade in the credit rating) would be associated with 19 basis points (bps) (3.2×5.8) decrease in lending spreads for a unit increase in reporting standards. This decline is about 8.2% of the average loan spread for our sample. The coefficient of the interaction term $Firm_risk \times DepthCreditInfo$, albeit smaller in magnitude (see column (2)), implies that a one standard deviation increase in firm risk is associated with a 3.8 bps (3.2×1.2) decrease in lending spreads for a unit increase in the depth of credit information. When both the interaction terms are included (see column (3)), the effect of reporting standards is similar to that in column (1), while, the information sharing variable is smaller and insignificant. The results suggest that better quality of information and greater information sharing are associated with lower cost of borrowing for riskier firms.

As the key explanatory variables are indices that have different ranges, we compare the coefficients of a regression with standardized dependent and explanatory variables (see Table A1 columns (1)–(3)). This comparison suggests that the effect of information quality is about 57% larger than the effect of information sharing on loan spreads of riskier firms. When both the interactions are included in column (3), the effect of $Firm_risk \times ReportingStd$ remains larger than the effect of $Firm_risk \times DepthCreditInfo$, although the latter is insignificant. Weak reporting standards can obscure firms' actual financial position that results in higher credit spreads in loan contracts. However, banks may be able to mitigate the lack of information sharing with private information generation, resulting in a lower sensitivity of loan spreads to information sharing.

Among control variables, maturity, amount, and collateral are positively correlated with loan spreads, whereas, covenants, number of lenders, foreign bank presence, lead bank size and interest margin are negatively related to spreads. All the signs are in the expected directions and corroborate the literature on syndicated loan spreads (Giannetti & Yafeh, 2012; Ivashina, 2009) for the loan amount. While the univariate correlation between the loan amount and spread is -0.21 , the positive effect of loan size after controlling for firm ratings and other factors could result from a premium charged for concentrated exposure.

3.2. Effects under economic policy uncertainty

We next examine the effects of information quality and sharing on loan spreads during periods of higher economic policy uncertainty using the following model:

$$Loan_spread_{ijt} = \delta_0 + \delta_1 Firm_risk_{ijt} + \delta_2 (Firm_risk_{ijt} \times QSI_{jt} \times EPU_{jt}) + \delta_3 (Firm_risk_{ijt} \times QSI_{jt}) + \delta_4 (Firm_risk_{ijt} \times EPU_{jt}) + \gamma X_{ijt} + \mu_i + \tau_t + (\rho_j \times \tau_t) + \epsilon_{ijt} \quad (2)$$

The economic policy uncertainty (EPU) index of Baker et al. (2016) used above relies on textual analysis of newspaper articles. Unlike measures of global uncertainty such as VIX index and Ted spread, which rely heavily on US markets and its policy decisions, country-specific EPU is available for both advanced and developing economies. The explanatory variable of interest is the interaction of $Firm_risk \times QSI \times EPU$. A negative sign of δ_2 would reflect the extent to which better information quality and sharing moderate the adverse effects of heightened economic policy uncertainty on riskier firms ($Firm_risk \times EPU$). All the country-specific variables such as EPU and QSI, and the interactions of these variables are subsumed by the country-year dummies ($\rho_j \times \tau_t$).

The results are shown in columns (4) and (5) of Table 3. We find that greater economic policy uncertainty results in higher loan spreads for riskier firms. The positive coefficient of $Firm_risk \times EPU$ indicates that a one standard deviation increase in EPU increases loan spreads by about 44 bps (1.17×37.4) for a 1 notch increase in firm risk. The negative coefficient of the interaction term ($Firm_risk \times ReportingStd \times EPU$) in column (3) suggests that the adverse effect of economic policy uncertainty is moderated by 7.5 bps (-0.20×37.4) for a unit increase in information quality. The moderating effect obtained for the triple interaction term ($Firm_risk \times DepthCreditInfo \times EPU$) in

Table 3. Effect of Information quality and sharing on loan spreads

	Baseline			Effects under uncertainty		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Firm_Rating</i> × <i>Reporting_Std</i>	-5.824*** (1.357)		-5.081*** (1.634)	-1.593 (1.578)		0.796 (2.067)
<i>Firm_Rating</i> × <i>DepthCreditInfo</i>		-1.222*** (0.431)	-0.367 (0.510)		-1.167*** (0.435)	-0.842 (0.576)
<i>Firm_Rating</i> × <i>EPU</i>				1.166*** (0.201)	0.347*** (0.074)	1.105*** (0.203)
<i>Firm_Rating</i> × <i>Reporting_Std</i> × <i>EPU</i>				-0.201*** (0.035)		-0.163*** (0.042)
<i>Firm_Rating</i> × <i>DepthCreditInfo</i> × <i>EPU</i>					-0.048*** (0.011)	-0.022 (0.014)
<i>Firm_Rating</i>	60.607*** (7.676)	35.653*** (2.960)	58.877*** (8.070)	36.591*** (8.893)	35.938*** (3.034)	29.000*** (9.886)
<i>Secured</i>	12.192** (5.127)	12.136*** (4.763)	12.279** (5.115)	12.506*** (5.084)	11.853*** (4.768)	12.485*** (5.073)
<i>Covenants</i>	-5.795 (3.654)	-6.408* (3.400)	-5.893 (3.630)	-6.052* (3.615)	-5.818* (3.391)	-6.283* (3.593)
<i>Log_amount</i>	7.226*** (2.021)	7.623*** (1.932)	7.161*** (2.014)	7.132*** (2.012)	8.124*** (1.917)	7.114*** (2.011)
<i>Log_maturity</i>	5.264 (3.479)	4.07 (3.290)	5.056 (3.480)	5.131 (3.446)	4.035 (3.272)	4.939 (3.439)
<i>Num_lenders</i>	-1.260*** (0.190)	-1.287*** (0.177)	-1.266*** (0.190)	-1.261*** (0.187)	-1.265*** (0.175)	-1.270*** (0.187)
<i>Foreign_bank</i>	-4.711 (4.455)	-4.249 (4.222)	-4.615 (4.462)	-4.62 (4.461)	-5.22 (4.207)	-4.5 (4.469)

(Continued)

Table 3. (Continued)

	Baseline			Effects under uncertainty		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Leadbank_asset</i>	-12.331*** (3.918)	-12.499*** (3.625)	-12.441*** (3.924)	-11.828*** (3.893)	-12.166*** (3.588)	-12.052*** (3.894)
<i>Leadbank_NIM</i>	-15.864*** (3.273)	-16.701*** (2.977)	-15.969*** (3.278)	-15.733*** (3.265)	-15.902*** (2.953)	-15.849*** (3.268)
<i>Constant</i>	-226.519*** (72.982)	2.571 (61.848)	-224.475*** (73.241)	-6.027 (67.565)	24.15 (61.426)	-0.188 (68.014)
<i>Firm-year obs.</i>	7,493	8,127	7,491	7,398	8,032	7,398
<i>Firms</i>	2,643	2,785	2,643	2,596	2,736	2,596
<i>Firm fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country-year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adj_R²</i>	0.346	0.383	0.345	0.349	0.387	0.349

The dependent variable in the estimations is the weighted average spread on drawn funds for the borrower in the year *t*. *Firm_risk* is based on the average rating across the three rating agencies. Issuer rating provided by each agency is treated as an ordinal variable which takes a value between 1 and 22, where 1 refers to a AAA rated firm and 22 refers to a D rated firm. Robust standard errors clustered at the firm-level are presented in the brackets. ***, **, and * indicate *p*-values at 1%, 5% and 10% levels, respectively. Economic policy uncertainty (*EPU*) is centered relative to the sample mean in the estimations. Detailed definitions of the variables are given in Table 1.

column (4) is 1.9 bps (-0.05×37.4) for a unit increase in information sharing. An 8 notch increase in firm risk (from A – rating at the 10th percentile to B – rating at the 90th percentile) would imply a moderating effect of 60 bps (15.2 bps) for a unit increase in reporting standards (depth of credit information). The results suggest that both improved information quality and credit information sharing among lenders is associated with a moderation in the effect of economic policy uncertainty on loan spreads of riskier firms, although the effect of information sharing is smaller than that for reporting standards (see column (6)). The results with standardized variables in columns (4) to (6) of Table A1 also support a greater importance of reporting standards during economic uncertainty compared to information sharing.

4. Robustness

We employ several alternative specifications to test the robustness of our main results. First, we re-estimate the baseline specification with an alternative definition of firm risk, *Spec_dum*, which indicates whether a firm is speculative grade (BB+ or worse). The results reported in columns (1) and (2) of Table 4 show that speculative grade firms, which otherwise face a higher loan spread of about 152 bps (101 bps), experience a reduction in spread of about 20 bps (8 bps) for a unit increase in reporting standards (depth of credit information). As indicated in columns (3) and (4), a one unit increase in reporting standards (depth of credit information) reduces loan spreads for speculative-grade firms by about 36 bps (9 bps) for a one standard deviation (37.4 unit) increase in *EPU*. Overall, the findings for the binary risk indicator are similar to that for the continuous measure of firm risk.

Second, some studies have argued that financial crisis events may exacerbate the role of information asymmetry in lending decisions in syndicated loan markets (Ivashina & Scharfstein, 2010). Drawing on these studies, we re-estimate Equations (1) and (2) with the exclusion of financial crisis years 2008 and 2009. The findings shown in Table 3 columns (5) to (8) are consistent with our findings in Table 4. Third, in order to address possible concerns of differences in spreads for loans denominated in various hard currencies, we restrict our sample to only US dollar loans. The results of the restricted sample shown in Table 4 columns (9) to (12) are consistent with our main findings.

Fourth, since the United States accounts for the majority of syndicated loans in our sample, we re-estimate Equations (1) and (2) for non-US firms. The results shown in columns (1) to (4) of Table 5 suggest that the effects of information quality and sharing are larger for the non-US sample as compared to the baseline results in Table 3. The results in columns (5) to (8) of Table 5 for only US dollar loans by non-US firms are also in line with our main findings. Finally, following Fotak et al. (2019), we exclude loan-specific control variables that may be simultaneously determined along with loan spreads. The results provided in Table A2 are consistent with our baseline results.

5. Conclusion

Our results suggest that improved information quality and sharing allow banks to more effectively screen and monitor riskier borrowers in syndicated loan markets. This can improve financing terms for riskier borrowers, especially during heightened economic policy uncertainty when information asymmetry is likely to be higher. We also find that information quality is more important as compared to information sharing for loan pricing. This may be explained by the ability of banks to substitute weak credit information sharing with private information generation, while worse reporting standards can obscure firms' actual financial position, which banks may have to price into their loan contracts. Our findings contribute to the literature on the role of the regulatory environment and information asymmetries in financial contracting during economic policy uncertainty.

Syndicated lending is an important financing source for non-financial corporations. Enhancing the institutional framework for improving auditing and reporting standards and expanding the scope of credit information sharing would allow banks to offer better financing terms to riskier borrowers and reduce the cost of capital of these firms.

Table 4. Robustness: Alternative risk category, exclusion of financial crisis years, and US dollar loans

	Alternative risk category			Excluding crisis years			USD loans					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Spec.dum</i> × <i>ReportingStd</i>	-19.950*** (7.389)		0.447 (8.723)									
<i>Spec.dum</i> × <i>DepthCreditInfo</i>		-8.021*** (2.036)		-7.751*** (2.020)								
<i>Spec.dum</i> × <i>EPU</i>			5.645*** (1.155)	1.642*** (0.421)								
<i>Spec.dum</i> × <i>ReportingStd</i> × <i>EPU</i>			-0.983*** (0.205)									
<i>Spec.dum</i> × <i>DepthCreditInfo</i> × <i>EPU</i>				-0.236*** (0.065)								
<i>Firm_risk</i> × <i>ReportingStd</i>					-7.368*** (1.440)		-3.835** (1.672)		-5.675*** (1.380)		-1.52 (1.611)	
<i>Firm_risk</i> × <i>DepthCreditInfo</i>						-1.165*** (0.429)		-1.114** (0.434)		-1.150*** (0.445)		-1.225*** (0.438)
<i>Firm_risk</i> × <i>EPU</i>							1.005*** (0.198)	0.350*** (0.075)			1.143*** (0.240)	0.325*** (0.093)
<i>Firm_risk</i> × <i>ReportingStd</i> × <i>EPU</i>							-0.175*** (0.035)				-0.197*** (0.043)	
<i>Firm_risk</i> × <i>DepthCreditInfo</i> × <i>EPU</i>								-0.048***				-0.044***

(Continued)

Table 4. (Continued)

	Alternative risk category			Excluding crisis years						USD loans					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)			
<i>Spec.dum</i>	152.440*** (41.474)	101.359*** (14.576)	35.811 (49.132)	103.099*** (14.495)				(0.011)				(0.015)			
<i>Firm_risk</i>					68.309*** (7.908)	34.300*** (2.912)	48.105*** (9.029)	34.772*** (3.023)	59.916*** (7.773)	35.263*** (3.043)	36.380*** (9.088)	36.422*** (3.089)			
<i>Secured</i>	22.083*** (5.868)	23.580*** (5.447)	22.123*** (5.832)	23.211*** (5.439)	7.212 (5.346)	7.787 (4.967)	7.808 (5.322)	7.448 (4.983)	13.392** (5.286)	13.004*** (4.923)	13.456** (5.248)	12.517** (4.943)			
<i>Covenants</i>	-5.576 (3.914)	-6.397* (3.648)	-5.793 (3.886)	-5.975 (3.632)	-8.219** (3.808)	-8.248** (3.524)	-8.476** (3.770)	-7.652** (3.516)	-6.055 (3.725)	-6.676* (3.467)	-6.177* (3.685)	-6.039* (3.461)			
<i>Log_amount</i>	6.667*** (2.067)	6.833*** (1.978)	6.629*** (2.062)	7.049*** (1.969)	6.436*** (2.001)	7.111*** (1.926)	6.314*** (1.987)	7.651*** (1.908)	6.667*** (2.091)	7.209*** (1.996)	6.605*** (2.084)	7.655*** (1.980)			
<i>Log_maturity</i>	4.067 (3.768)	3.004 (3.620)	3.885 (3.749)	3.149 (3.601)	5.913 (3.698)	4.941 (3.473)	5.556 (3.667)	5.208 (3.449)	5.429 (3.522)	4.388 (3.336)	5.537 (3.493)	4.443 (3.319)			
<i>Num_lenders</i>	-1.564*** (0.217)	-1.633*** (0.203)	-1.574*** (0.216)	-1.624*** (0.203)	-1.096*** (0.179)	-1.150*** (0.168)	-1.089*** (0.177)	-1.123*** (0.166)	-1.239*** (0.195)	-1.284*** (0.181)	-1.249*** (0.193)	-1.256*** (0.180)			
<i>Foreign_bank</i>	-4.71 (4.741)	-4.672 (4.477)	-4.608 (4.740)	-5.193 (4.472)	-8.827** (4.393)	-8.355** (4.205)	-8.817** (4.395)	-9.456** (4.199)	-4.571 (4.523)	-4.028 (4.294)	-4.449 (4.532)	-4.982 (4.278)			
<i>Leadbank_casstet</i>	-13.917*** (4.106)	-14.454*** (3.778)	-13.600*** (4.092)	-14.355*** (3.762)	-11.663*** (4.150)	-11.408*** (3.789)	-11.298*** (4.142)	-11.128*** (3.750)	-12.648*** (4.033)	-12.840*** (3.745)	-12.051*** (4.005)	-12.581*** (3.703)			
<i>Leadbank_NIM</i>	-16.940*** (3.228)	-17.269*** (2.950)	-16.748*** (3.219)	-16.896*** (2.935)	-16.579*** (3.433)	-17.420*** (3.082)	-16.639*** (3.431)	-16.537*** (3.061)	-15.973*** (3.318)	-16.837*** (3.019)	-15.919*** (3.314)	-16.023*** (2.993)			
<i>Constant</i>	104.038 (70.996)	328.960*** (58.130)	318.620*** (62.846)	327.498*** (57.846)	-218.423*** (76.308)	6.272 (64.256)	11.672 (71.773)	24.404 (63.711)	-220.628*** (74.798)	8.148 (63.537)	-4.996 (69.148)	30.23 (63.069)			
<i>Firm-year_obs.</i>	7,493	8,127	7,398	8,032	6,970	7,604	6,889	7,523	7,220	7,835	7,127	7,742			

(Continued)

Table 4. (Continued)

	Alternative risk category				Excluding crisis years				USD loans			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Firms</i>	2,643	2,785	2,596	2,736	2,567	2,720	2,527	2,679	2,528	2,664	2,483	2,617
<i>Firm fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country-year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adj_ R²</i>	0.291	0.33	0.292	0.331	0.318	0.353	0.32	0.359	0.344	0.381	0.346	0.386

The dependent variable in the estimations is the weighted average spread on drawn funds for the borrower in the year t . *Firm_risk* is based on the average rating across the three rating agencies. Issuer rating provided by each agency is treated as an ordinal variable which takes a value between 1 and 22, where 1 refers to a AAA rated firm and 22 refers to a D rated firm. Economic policy uncertainty (*EPU*) is centered (relative to the sample mean). Robust standard errors clustered at the firm-level are presented in the brackets. ***, ** and * indicate p -values at 1%, 5% and 10% levels, respectively. Detailed definitions of the variables are given in Table 1.

Table 5. Results for non-US firms

	Non-US firms—All loans				Non-US firms—USD loans			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Firm_risk</i> × <i>ReportingStd</i>	-19.113*** (4.788)		-14.634*** (5.274)		-19.762*** (6.404)		-17.777*** (6.795)	
<i>Firm_risk</i> × <i>DepthCreditInfo</i>		-3.686*** (1.074)		-0.581 (1.495)		-4.226** (1.722)		-2.225 (1.914)
<i>Firm_risk</i> × <i>EPU</i>			0.790*** (0.299)	0.372** (0.146)			0.596* (0.357)	0.408** (0.194)
<i>Firm_risk</i> × <i>ReportingStd</i> × <i>EPU</i>			-0.137*** (0.050)				-0.104* (0.060)	
<i>Firm_risk</i> × <i>DepthCreditInfo</i> × <i>EPU</i>				-0.056*** (0.020)				-0.060** (0.026)
<i>Firm_risk</i>	128.749*** (28.214)	38.221*** (8.703)	103.317*** (30.536)	21.294** (9.007)	129.471*** (36.268)	38.972*** (11.804)	118.412*** (38.081)	27.783** (10.833)
<i>Secured</i>	-22.453 (17.902)	-17.401 (17.447)	-20.484 (18.852)	-19.822 (17.340)	-24.297 (22.740)	-17.082 (23.334)	-25.395 (24.170)	-24.199 (23.981)
<i>Covenants</i>	15.746 (21.699)	11.631 (21.172)	18.228 (21.077)	13.524 (20.500)	11.472 (27.360)	1.106 (28.104)	18.399 (26.772)	5.033 (25.912)
<i>Log_amount</i>	15.644*** (5.456)	14.525** (6.098)	15.114*** (5.093)	14.772*** (5.584)	13.840* (7.192)	14.915** (7.099)	13.509* (7.087)	15.235** (6.909)
<i>Log_maturity</i>	7.109 (16.246)	-0.172 (15.242)	4.377 (16.816)	1.127 (15.467)	6.325 (18.986)	-0.715 (17.787)	5.258 (19.822)	2.734 (18.215)
<i>Num_lenders</i>	-1.125**	-1.032**	-1.176**	-1.177**	-1.150*	-1.233**	-1.280**	-1.405**

(Continued)

Table 5. (Continued)

	Non-US firms—All loans				Non-US firms—USD loans			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(0.473)	(0.453)	(0.471)	(0.467)	(0.593)	(0.606)	(0.605)	(0.629)
<i>Foreign_bank</i>	1.067	-0.295	-1.868	-3.368	24.214	26.457	21.739	18.256
	(20.872)	(21.251)	(19.980)	(21.061)	(42.937)	(41.750)	(40.597)	(40.097)
<i>Leadbank_asset</i>	-1.78	-9.136	-1.18	-7.433	-7.47	-19.955	-5.406	-20.064
	(11.699)	(12.144)	(11.877)	(11.849)	(19.356)	(22.652)	(19.208)	(22.259)
<i>Leadbank_NIM</i>	-4.323	-6.607	-2.632	-5.128	-0.734	-2.993	-0.841	-2.123
	(8.355)	(9.288)	(8.130)	(8.882)	(9.870)	(10.804)	(9.726)	(10.422)
<i>Constant</i>	-431.321*	-38.644	-36.868	99.218	-352.743	109.743	-146.825	271.004
	(235.304)	(262.198)	(257.388)	(261.698)	(324.012)	(388.453)	(284.474)	(393.479)
<i>Firm-year obs.</i>	959	1,014	864	919	739	778	646	685
<i>Firms</i>	462	487	415	438	352	370	307	323
<i>Firm fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country-year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>0.502</i>	0.472	0.477	0.458	0.484	0.445	0.444	0.424	

The dependent variable in the estimations is the weighted average spread on drawn funds for the borrower in the year t . *Firm_risk* is based on the average rating across the three rating agencies. Issuer rating provided by each agency is treated as an ordinal variable which takes a value between 1 and 22, where 1 refers to a AAA rated firm and 22 refers to a D rated firm. Economic policy uncertainty (*EPU*) is centered (relative to the sample mean). Robust standard errors clustered at the firm-level are presented in the brackets. ***, ** and * indicate p -values at 1%, 5% and 10% levels, respectively. Detailed definitions of the variables are given in Table 1.

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Notes

1. Diamond (1991) argues that banks may be reluctant to lend to riskier borrowers due to higher monitoring costs.
2. Hard currency loans in our sample include those denominated in US dollars, euros, British pounds, Japanese yen, Australian dollars, and Canadian dollars. In order to ensure that our main results are not driven by choice of currency, we perform robustness tests of our main results with only US dollar loans, which constitute about 96% of our sample.

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Appendix

Table A1. Baseline regression with standardized variables

	Baseline			Effects under uncertainty		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Firm_Rating</i> × <i>Reporting_Std</i>	-0.044*** (0.010)		-0.039*** (0.012)	-0.012 (0.012)		0.006 (0.016)
<i>Firm_Rating</i> × <i>DepthCreditInfo</i>		-0.028*** (0.010)	-0.008 (0.011)		-0.025*** (0.010)	-0.019 (0.013)
<i>Firm_Rating</i> × <i>EPU</i>				0.041*** (0.009)	0.030*** (0.008)	0.045*** (0.010)
<i>Firm_Rating</i> × <i>Reporting_Std</i> × <i>EPU</i>				-0.002*** (0.000)		-0.001*** (0.000)
<i>Firm_Rating</i> × <i>DepthCreditInfo</i> × <i>EPU</i>					-0.001*** (0.000)	-0.001 (0.000)
<i>Firm_Rating</i>	0.587*** (0.056)	0.569*** (0.046)	0.586*** (0.057)	0.578*** (0.056)	0.590*** (0.056)	0.581*** (0.056)
<i>Secured</i>	0.078** (0.033)	0.078** (0.031)	0.079** (0.033)	0.080** (0.033)	0.077** (0.033)	0.080** (0.033)
<i>Covenants</i>	-0.037 (0.023)	-0.041* (0.022)	-0.038 (0.023)	-0.039* (0.023)	-0.038* (0.023)	-0.040* (0.023)
<i>Log_amount</i>	0.054*** (0.015)	0.057*** (0.014)	0.054*** (0.015)	0.053*** (0.015)	0.055*** (0.015)	0.053*** (0.015)
<i>Log_maturity</i>	0.013 (0.009)	0.01 (0.008)	0.012 (0.009)	0.013 (0.009)	0.013 (0.009)	0.012 (0.008)
<i>Num_lenders</i>	-0.059***	-0.060***	-0.059***	-0.059***	-0.060***	-0.060***

(Continued)

Table A1. (Continued)

	Baseline			Effects under uncertainty		
<i>Foreign_bank</i>	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
	-0.03	-0.027	-0.03	-0.03	-0.029	-0.029
	(0.029)	(0.027)	(0.029)	(0.029)	(0.029)	(0.029)
<i>Leadbank_asset</i>	-0.048***	-0.049***	-0.049***	-0.046***	-0.048***	-0.047***
	(0.015)	(0.014)	(0.015)	(0.015)	(0.015)	(0.015)
<i>Leadbank_NIM</i>	-0.087***	-0.092***	-0.088***	-0.087***	-0.087***	-0.087***
	(0.018)	(0.016)	(0.018)	(0.018)	(0.018)	(0.018)
<i>Constant</i>	-1.726***	-0.382***	-1.646***	-0.429***	-0.433***	-0.428***
	(0.127)	(0.040)	(0.162)	(0.038)	(0.038)	(0.038)
<i>Firm-year obs.</i>	7,491	8,127	7,491	7,398	7,398	7,398
<i>Firms</i>	2,643	2,785	2,643	2,596	2,596	2,596
<i>Firm fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country-year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.345	0.383	0.345	0.349	0.348	0.349

The dependent variable in the estimations is the weighted average spread on drawn funds for the borrower in year t . *Firm.risk* is based on the average rating across the three rating agencies. Issuer rating provided by each agency is treated as an ordinal variable which takes a value between 1 and 22, where 1 refers to a AAA rated firm and 22 refers to a D rated firm. Economic policy uncertainty (EPU) is centered (relative to the sample mean). Robust standard errors clustered at the firm-level are presented in the brackets. ***, **, * and * indicate p-values at 1%, 5% and 10% levels. Detailed definitions of the variables are given in Table 1.

Table A2. Baseline regression excluding loan-level controls

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Firm_Rating</i> × <i>Reporting_Std</i>	-6.680*** (1.370)		-6.493*** (1.660)	-3.141* (1.651)		-0.821 (2.227)
<i>Firm_Rating</i> × <i>DepthCreditInfo</i>		-1.138*** (0.439)	-0.104 (0.523)		-1.167*** (0.451)	-0.713 (0.608)
<i>Firm_Rating</i> × <i>EPU</i>				0.814*** (0.208)	0.374*** (0.074)	0.793*** (0.201)
<i>Firm_Rating</i> × <i>Reporting_Std</i> × <i>EPU</i>				-0.137*** (0.036)		-0.086** (0.039)
<i>Firm_Rating</i> × <i>DepthCreditInfo</i> × <i>EPU</i>					-0.051*** (0.011)	-0.041*** (0.013)
<i>Firm_Rating</i>	68.943*** (8.208)	37.706*** (3.234)	68.574*** (8.565)	49.048*** (9.823)	38.736*** (3.315)	41.053*** (10.975)
<i>Constant</i>	-278.936*** (45.753)	-195.236*** (26.974)	-278.937*** (45.979)	-188.174*** (32.469)	-114.095* (66.316)	-181.190*** (32.148)
<i>Firm-year obs.</i>	8,278	9,117	8,276	8,167	9,003	8,167
<i>Firms</i>	2,882	3,075	2,882	2,829	3,018	2,829
<i>Firm fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Country-year fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.344	0.373	0.343	0.344	0.377	0.345

The dependent variable in the estimations is the weighted average spread on drawn funds for the borrower in year *t*. *Firm_risk* is based on the average rating across the three rating agencies. Issuer rating provided by each agency is treated as an ordinal variable which takes a value between 1 and 22, where 1 refers to a AAA rated firm and 22 refers to a D rated firm. Economic policy uncertainty (*EPU*) is centered (relative to the sample mean). Robust standard errors clustered at the firm-level are presented in the brackets. ***, **, and * indicate p-values at 1%, 5% and 10% levels. Detailed definitions of the variables are given in Table 1.



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