

**Internet Appendix for  
“Environmental Regulation and the Cost of Bank Loans: International Evidence”**

July 2020

**Abstract**

In this internet appendix, we report the results of some additional analyses as well as the complete version of Tables 7, 8 and 9.

*JEL Classification: G21; G32; Q51*

*Keywords: Environmental Regulations; Business Risk; Bank Loan Contracting*

**Table 7**  
Potential Channels

<i>Panel A: Without US Firms</i>							
No. of Syndicate Participants		Leverage		Altman-Z		Credit Rating	
EPS	-1.012** (-2.32)	EPS	-0.038*** (-4.37)	EPS	-0.089*** (-3.29)	EPS	0.124** (2.29)
Firm Size	-1.060 (-1.54)	Firm Size	-0.106 (-0.53)	Firm Size	0.088** (2.57)	Firm Size	-0.104*** (-6.80)
Operating Profit	5.710** (2.28)	Operating Profit	-0.199*** (-3.03)	Operating Profit	6.963*** (19.66)	Operating Profit	-5.082*** (-13.03)
Leverage	-0.807 (-0.83)	Market/Book	0.003*** (4.87)	Leverage	-1.308*** (-12.43)	Leverage	1.687*** (10.00)
Asset Tangibility	0.267 (0.33)	Sales	0.000 (0.45)	Cash	0.565*** (2.80)	Asset Tangibility	-0.331** (-2.59)
Loan Amount	0.011 (1.53)	R&D	-0.003 (-0.72)	FCF	-0.021 (-0.07)	Cash	1.917*** (6.69)
Loan Maturity	0.009 (0.03)	FCF	-0.309*** (-4.38)	Market/Book	-0.003 (-1.44)	Market/Book	0.006* (1.91)
Term Loan	-2.666** (-2.36)	CASH	-0.472*** (-10.56)	Asset Tangibility	-0.364*** (-4.34)	Political Stability	-0.175 (-1.30)
GDP growth%	0.037 (0.28)	Dividend	-0.018* (-1.69)	R&D	-0.017 (-0.65)	Anti-Corruption	0.099 (0.55)
Inflation Rate	0.160 (1.11)	Constant	0.491*** (15.53)	HHI	0.140** (2.39)	Constant	3.403*** (8.86)
Political Stability	2.692** (2.49)			GDP growth%	0.014 (1.64)		
Anti-Corruption	3.857*** (2.73)			Inflation Rate	0.003 (0.52)		
Constant	-6.275 (-1.44)			Political Stability	0.124** (1.99)		
				Anti-Corruption	0.034 (0.37)		
				Constant	1.652** (2.45)		
Loan Type & Purpose FE	Yes						
Year FE	Yes	Year FE	Yes	Year FE	Yes	Year FE	Yes
Industry FE	Yes	Industry FE	Yes	Industry FE	Yes	Industry FE	Yes
Country FE	Yes	Country FE	Yes	Country FE	Yes	Country FE	Yes
Observations	5,473	Observations	5,048	Observations	1,462	Observations	4,601
Adj. R <sup>2</sup>	0.183	Adj. R <sup>2</sup>	0.244	Adj. R <sup>2</sup>	0.875	Adj. R <sup>2</sup>	0.529

<i>Panel B: With US Firms</i>							
No. of Syndicate Participants		Leverage		Altman-Z		Credit Rating	
EPS	-1.533*** (-4.29)	EPS	-0.021** (-2.36)	EPS	-0.091*** (-4.21)	EPS	0.127*** (2.61)
Firm Size	-0.672 (-0.98)	Firm Size	-0.141 (-0.69)	Firm Size	0.023 (0.66)	Firm Size	-0.122*** (-6.77)
Operating Profit	7.783*** (10.89)	Operating Profit	0.040 (0.68)	Operating Profit	7.457*** (54.01)	Operating Profit	-4.819*** (-15.72)
Leverage	0.816 (1.51)	Market/Book	-0.001** (-2.47)	Leverage	-2.069*** (-39.46)	Leverage	1.897*** (24.18)
Asset Tangibility	0.714** (2.47)	Sales	0.000 (0.61)	Cash	-0.442*** (-4.20)	Asset Tangibility	-0.225*** (-3.03)
Loan Amount	0.019*** (3.29)	R&D	-0.013 (-1.17)	FCF	0.241* (1.94)	Cash	1.668*** (9.35)
Loan Maturity	1.910*** (6.83)	FCF	-0.438*** (-10.39)	Market/Book	-0.001 (-0.52)	Market/Book	-0.013*** (-4.82)
Term Loan	-1.989*** (-3.97)	CASH	-0.625*** (-36.81)	Asset Tangibility	-0.254*** (-3.81)	Political Stability	-0.035 (-0.32)
GDP growth%	-0.121 (-0.95)	Dividend	-0.009* (-1.84)	R&D	-0.196** (-1.99)	Anti-Corruption	0.111 (0.74)
Inflation Rate	0.160 (1.18)	Constant	0.414*** (23.39)	HHI	0.077 (1.31)	Constant	0.127*** (2.61)
Political Stability	3.124*** (3.72)			GDP growth%	0.002 (0.23)		
Anti-Corruption	4.824*** (3.78)			Inflation Rate	0.007 (0.98)		
Constant	-6.696** (-2.23)			Political Stability	0.128** (2.47)		
				Anti-Corruption	0.024 (0.33)		
				Constant	1.922*** (14.04)		
Year FE	Yes	Year FE	Yes	Year FE	Yes	Year FE	Yes
Industry FE	Yes	Industry FE	Yes	Industry FE	Yes	Industry FE	Yes
Country FE	Yes	Country FE	Yes	Country FE	Yes	Country FE	Yes
Observations	33,272	Observations	35,386	Observations	28,677	Observations	15,678
Adj. R <sup>2</sup>	0.0762	Adj. R <sup>2</sup>	0.171	Adj. R <sup>2</sup>	0.607	Adj. R <sup>2</sup>	0.416

This table reports the regression results analyzing the potential channels through which EPS affects loan spreads. Dependent variables are the *number of participants in a loan syndicate*, *leverage*, *modified Altman-Z*, and *Credit ratings* in Models (1), (2), (3), and (4), respectively. All control variables, their sources, and definitions are described in Appendix A. Panel A excludes US firms from the sample. Panel B includes US firms. All models include loan type and purpose dummies, year, industry, and country fixed effects. The numbers in parentheses are *t*-statistics. Standard errors are clustered by country-year. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table 8**

Subsample Analyses

<i>Panel A: Without US Firms</i>	<u>Financial Constraint</u>		<u>Env. Litigation Risk</u>		<u>Bank- vs Market-Based</u>		<u>First half vs second half</u>	
	High	Low	High	Low	Bank-Based	Mkt-Based	Prior 2002	Post 2002
EPS	0.186*** (4.53)	-0.004 (-0.08)	0.191*** (4.62)	-0.020 (-0.40)	0.279*** (2.74)	0.100** (2.39)	-0.214 (-1.29)	0.105** (2.08)
<b>Borrower Characteristics</b>								
Firm Size	0.060 (0.87)	-0.710** (-2.48)	0.077 (0.83)	-2.039 (-1.55)	0.238*** (7.41)	-0.084 (-1.45)	0.070* (1.66)	-0.722** (-2.55)
Operating Profit	-1.418*** (-5.84)	-2.279*** (-5.92)	-1.566*** (-4.88)	-1.853*** (-8.24)	-1.400*** (-3.87)	-1.856*** (-8.50)	-2.494*** (-6.73)	-1.523*** (-6.90)
Leverage	0.643*** (7.18)	0.682*** (4.80)	0.551*** (4.46)	0.747*** (8.40)	1.012*** (6.11)	0.565*** (6.96)	0.661*** (4.82)	0.648*** (6.94)
Asset Tangibility	-0.138 (-1.57)	-0.328*** (-3.27)	-0.297*** (-2.93)	-0.117 (-1.25)	-0.281** (-2.12)	-0.237*** (-2.97)	-0.375*** (-2.78)	-0.176** (-2.35)
<b>Loan Characteristics</b>								
Loan Amount	0.000 (0.17)	-0.002 (-1.33)	-0.004** (-2.35)	0.000 (1.06)	0.000 (0.25)	-0.001 (-0.35)	0.000* (1.78)	-0.001 (-0.85)
Loan Maturity	0.091*** (3.52)	0.123*** (3.53)	0.148*** (4.80)	0.071*** (2.66)	0.117*** (2.74)	0.107*** (4.64)	0.118*** (2.84)	0.078*** (3.17)
Term Loan	0.711*** (3.07)	0.139 (1.05)	0.352*** (2.12)	0.197 (0.94)	0.752*** (4.63)	0.158 (1.16)	0.150 (0.89)	0.481*** (3.82)
<b>Country Characteristics</b>								
GDP growth%	-0.038*** (-3.54)	-0.023 (-1.43)	-0.033*** (-2.65)	-0.027** (-2.04)	-0.030*** (-2.90)	-0.019 (-1.29)	-0.017 (-0.96)	-0.029** (-2.17)
Inflation Rate	0.027*** (4.04)	0.059*** (4.44)	0.042*** (4.06)	0.024*** (3.07)	0.049*** (4.23)	0.016* (1.70)	0.031** (2.53)	0.066*** (6.94)
Political Stability	-0.169* (-1.79)	-0.159 (-1.14)	-0.287** (-2.50)	-0.118 (-0.94)	-0.251 (-1.52)	-0.173 (-1.54)	-0.638*** (-3.22)	-0.085 (-0.63)
Anti-Corruption	0.028 (0.22)	-0.155 (-0.77)	-0.017 (-0.12)	-0.282* (-1.88)	-0.211 (-0.90)	-0.572*** (-3.73)	0.315 (0.96)	-0.173 (-0.95)
Constant	4.010*** (9.12)	4.922*** (10.97)	4.380*** (10.74)	6.021*** (13.85)	3.147*** (6.56)	6.009*** (17.21)	4.210*** (5.53)	4.859*** (11.58)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,343	2,273	2,660	2,956	1,741	3,823	1,630	3,986
Adj. R <sup>2</sup>	0.632	0.639	0.630	0.629	0.674	0.604	0.545	0.497
p-value of $\chi^2$ test of Coeff diff		0.00		0.00		0.02		0.02

<i>Panel B: With US Firms</i>	<u>Financial Constraint</u>		<u>Env. Litigation Risk</u>		<u>Bank- vs Market-Based</u>		<u>First half vs second half</u>	
	High	Low	High	Low	Bank-Based	Mkt-Based	Prior 2002	Post 2002
EPS	0.219*** (5.65)	0.062 (1.30)	0.201*** (5.32)	0.172*** (3.89)	0.279*** (2.74)	0.178*** (4.53)	0.125 (0.74)	0.104** (2.59)
<b>Borrower Characteristics</b>								
Firm Size	-0.012 (-0.23)	-0.763** (-2.47)	-0.040 (-0.42)	-2.871** (-2.15)	0.238*** (7.41)	-0.135* (-1.77)	0.051 (1.37)	-1.178*** (-3.96)
Operating Profit	-1.726*** (-18.16)	-2.665*** (-15.25)	-1.951*** (-12.74)	-2.392*** (-20.68)	-1.400*** (-3.87)	-2.213*** (-17.84)	-2.049*** (-15.29)	-2.299*** (-14.45)
Leverage	0.561*** (19.89)	0.232*** (6.10)	0.661*** (14.17)	0.626*** (21.10)	1.012*** (6.11)	0.621*** (18.63)	0.581*** (12.02)	0.646*** (14.96)
Asset Tangibility	-0.211*** (-7.50)	-0.022 (-0.33)	-0.185** (-2.46)	-0.242*** (-8.74)	-0.281** (-2.12)	-0.205*** (-5.61)	-0.354*** (-8.32)	-0.127*** (-4.41)
<b>Loan Characteristics</b>								
Loan Amount	-0.000 (-0.70)	-0.005** (-2.22)	-0.006** (-2.34)	-0.000 (-1.08)	0.000 (0.25)	-0.014 (-1.22)	0.000 (0.36)	-0.002 (-1.51)
Loan Maturity	-0.028 (-1.28)	-0.008 (-0.29)	-0.016 (-0.48)	-0.019 (-0.82)	0.117*** (2.74)	-0.031 (-1.17)	-0.022 (-0.50)	0.012 (0.54)
Term Loan	0.150*** (3.04)	0.161** (2.47)	0.105 (1.54)	0.161*** (2.90)	0.752*** (4.63)	0.108** (2.58)	0.121*** (2.68)	0.262** (2.45)
<b>Country Characteristics</b>								
GDP growth%	-0.009 (-0.79)	-0.006 (-0.42)	-0.010 (-0.86)	-0.008 (-0.62)	-0.030*** (-2.90)	0.025 (1.46)	0.032 (1.65)	-0.028** (-2.07)
Inflation Rate	0.025*** (3.27)	0.055*** (4.37)	0.053*** (5.19)	0.018** (2.21)	0.049*** (4.23)	0.025* (1.87)	0.009 (0.57)	0.065*** (6.38)
Political Stability	-0.388*** (-4.63)	-0.205** (-2.12)	-0.397*** (-5.03)	-0.356*** (-3.56)	-0.251 (-1.52)	-0.443*** (-4.63)	-0.777*** (-2.98)	-0.447*** (-4.26)
Anti-Corruption	-0.022 (-0.17)	-0.309** (-2.49)	-0.133 (-1.14)	-0.253* (-1.94)	-0.211 (-0.90)	-0.454*** (-3.45)	0.846*** (3.30)	-0.073 (-0.55)
Constant	5.248*** (20.01)	5.564*** (21.13)	5.225*** (19.25)	5.536*** (21.79)	3.147*** (6.56)	5.801*** (22.10)	4.396*** (7.79)	5.325*** (18.64)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,273	14,275	12,906	20,642	1,741	31,755	12,656	20,892
Adj. R <sup>2</sup>	0.442	0.478	0.448	0.459	0.608	0.448	0.474	0.439
p-value of $\chi^2$ test of Coeff diff		0.00		0.41		0.19		0.00

In this table, we compare the effect of EPS between the pairs of categories. In all models, the dependent variable is  $\ln(\text{Spread})$ . In the first two columns, we use the median of the Kaplan-Zingales Index (1997) to split samples into firms with high and low financial constraints. In the next two columns, firms in industries with the percentage of environmental litigation cases more than (below) the sample average are categorized as a high (low) risk. Columns 5 and 6 compare the impact of EPS on loan spreads between bank-based and market-based economies. Classification of countries is based on Demircuc-Kunt and Levine (2001). For the countries that are not in that classification, we use the classification introduced by Levine (2002). In the last two columns, we split the sample in the midpoint of the sample period. From 1991 to 2002 and from 2003 to 2014. Panel A excludes US firms from the sample. Panel B includes US firms. All control variables are defined in Appendix A. Year, industry, country, loan type, and loan purpose dummies are included but not reported for brevity. Numbers in parentheses are  $t$ -statistics computed using standard errors that are clustered at the country-year level. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table 9**

Long-Term and Short-Term Effects of Environmental Policy Stringency on Cost of Bank Loan

<i>Panel A: Without US Firms</i>	(1)	(2)	(3)	(4)	(5)
EPS <sub>t-1</sub>	0.098** (2.53)				0.357* (1.92)
EPS <sub>t-2</sub>		0.177*** (3.44)			0.074 (0.65)
EPS <sub>t-3</sub>			0.042 (0.86)		-0.100 (-0.75)
EPS <sub>t-4</sub>				-0.031 (-0.69)	0.160 (1.05)
<b>Borrower Characteristics</b>					
Firm Size	-1.756*** (-10.50)	-2.168*** (-6.29)	-1.805*** (-4.84)	-2.039*** (-4.35)	-1.372 (-0.85)
Operating Profit	0.646*** (8.57)	1.152*** (6.82)	0.786*** (4.74)	1.072*** (5.02)	0.806 (1.12)
Leverage	-0.209*** (-3.49)	-0.306** (-2.10)	-0.250* (-1.96)	-0.078 (-0.41)	-0.048 (-0.10)
Asset Tangibility	-0.011 (-0.12)	0.006 (0.01)	-0.991 (-1.65)	-0.012 (-0.03)	5.245 (1.14)
<b>Loan Characteristics</b>					
Loan Amount	0.000 (0.21)	-0.020** (-2.35)	-0.003 (-1.20)	-0.032** (-2.47)	-0.012 (-0.65)
Loan Maturity	0.020 (0.71)	0.011 (0.23)	-0.029 (-0.60)	-0.054 (-0.91)	-0.111 (-0.79)
Term Loan	0.381*** (9.24)	0.418*** (5.11)	0.404*** (3.81)	0.312** (2.52)	0.757* (1.76)
<b>Country Characteristics</b>					
GDP growth %	-0.031*** (-2.60)	-0.036** (-2.07)	-0.026 (-1.36)	0.008 (0.59)	-0.022 (-0.71)
Inflation Rate	0.032*** (5.12)	0.010 (0.79)	0.081*** (4.66)	0.023 (1.31)	-0.016 (-0.33)
Political Stability	-0.144* (-1.68)	-0.148 (-0.93)	0.101 (0.67)	0.018 (0.13)	0.130 (0.18)
Anti-Corruption	-0.135 (-1.21)	-0.508*** (-2.70)	-0.365* (-1.77)	-0.072 (-0.31)	-1.129 (-1.39)
Constant	5.392*** (16.67)	6.169*** (11.62)	5.055*** (9.36)	5.176*** (7.60)	5.057*** (3.20)
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes	Yes
Observations	3,296	803	775	647	154
Adj. R <sup>2</sup>	0.567	0.625	0.614	0.585	0.611

<b>Panel B: With US Firms</b>	(1)	(2)	(3)	(4)	(5)
EPS <sub>t-1</sub>	0.198*** (5.71)				0.183* (1.69)
EPS <sub>t-2</sub>		0.103** (2.30)			-0.005 (-0.07)
EPS <sub>t-3</sub>			0.129*** (3.14)		0.045 (0.46)
EPS <sub>t-4</sub>				-0.013 (-0.28)	-0.018 (-0.18)
<b>Borrower Characteristics</b>					
Firm Size	-2.181*** (-19.64)	-2.694*** (-17.80)	-2.613*** (-15.31)	-2.871*** (-12.89)	-3.670*** (-12.88)
Operating Profit	0.589*** (19.42)	0.640*** (17.87)	0.649*** (17.31)	0.685*** (12.44)	0.709*** (8.80)
Leverage	-0.218*** (-5.21)	-0.190*** (-3.75)	-0.180*** (-3.43)	-0.122** (-2.40)	-0.170* (-1.91)
Asset Tangibility	-0.093 (-1.29)	-0.786 (-0.62)	-1.540* (-1.86)	-0.540 (-1.04)	-2.334 (-0.56)
<b>Loan Characteristics</b>					
Loan Amount	-0.001 (-1.03)	-0.084** (-2.37)	-0.009** (-2.06)	-0.108** (-2.18)	-0.065* (-1.83)
Loan Maturity	-0.047 (-1.36)	0.038 (1.48)	0.006 (0.23)	0.016 (0.68)	0.091*** (3.00)
Term Loan	0.412*** (18.83)	0.414*** (11.26)	0.424*** (11.02)	0.404*** (14.31)	0.488*** (8.19)
<b>Country Characteristics</b>					
GDP growth %	-0.003 (-0.28)	-0.021 (-1.40)	-0.002 (-0.16)	0.012 (0.73)	-0.015 (-0.61)
Inflation Rate	0.034*** (4.51)	0.022 (1.49)	0.088*** (4.84)	0.039** (2.27)	0.064** (2.16)
Political Stability	-0.322*** (-4.63)	-0.366*** (-2.88)	-0.258** (-2.34)	-0.179 (-1.26)	-0.573** (-2.28)
Anti-Corruption	-0.141 (-1.43)	-0.350** (-2.01)	-0.215 (-1.43)	-0.262 (-1.31)	-0.548 (-1.65)
Constant	5.015*** (21.12)	5.175*** (17.29)	4.655*** (15.92)	5.332*** (15.92)	4.783*** (6.70)
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes	Yes
Observations	20,193	7,183	7,220	6,604	1,883
Adj. R <sup>2</sup>	0.494	0.570	0.554	0.578	0.626

This table presents the long-term and short-term impact of environmental regulation on the cost of bank loans. The dependent variable, *SPREAD*, is the average  $\ln(\text{spread})$  of all loans issued to a firm in a given year. *EPS* is the score ranging from 0 to 6 where the higher the number, the more stringent regulations are in a country. Panel A excludes US firms from the sample. Panel B includes US firms. Definitions of all control variables are provided in Appendix A. All loan-level variables are averaged across loans issued in a given year to an individual firm. Year, industry, country, loan type, and loan purpose dummies are included but not reported for brevity. The numbers in parentheses are *t*-statistics. Standard errors are clustered by year and country. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table A.1**

## Environmental Policy Stringency Index by Country

Country:	Australia	Belgium	Brazil	Canada	China	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	India	Indonesia
Year														
1990	0.50	0.67	—	0.38	0.25	0.90	0.83	0.71	1.21	0.65	0.35	0.52	0.40	0.38
1991	0.50	0.67	—	0.38	0.44	1.58	1.00	0.71	2.13	0.73	0.48	0.48	0.40	0.38
1992	0.50	0.71	—	0.71	0.52	2.13	1.25	0.71	1.88	0.77	0.52	0.52	0.40	0.38
1993	0.75	0.77	—	0.50	0.52	2.23	1.31	0.77	1.94	1.02	0.52	0.58	0.40	0.38
1994	0.50	0.77	—	0.50	0.52	2.23	1.27	0.81	1.90	1.48	0.52	0.58	0.40	0.38
1995	0.50	0.77	0.42	0.50	0.52	1.98	1.27	0.81	1.81	1.73	0.52	0.58	0.46	0.44
1996	0.46	0.77	0.42	0.46	0.52	1.98	1.52	1.23	1.85	1.69	0.52	0.73	0.46	0.44
1997	0.46	0.77	0.42	0.65	0.52	1.98	1.77	1.15	1.94	1.69	0.52	0.73	0.46	0.44
1998	0.77	0.77	0.42	0.65	0.52	2.56	1.52	1.23	1.98	1.69	0.56	0.77	0.46	0.44
1999	1.02	0.77	0.42	0.65	0.52	2.40	1.52	1.31	1.98	1.69	0.52	0.77	0.46	0.44
2000	0.98	0.85	0.42	0.90	0.52	2.60	1.60	1.40	2.06	1.52	0.85	0.85	0.56	0.44
2001	1.09	1.10	0.54	0.90	0.52	2.74	1.35	1.56	2.06	1.52	1.69	0.81	0.56	0.44
2002	1.21	1.21	0.63	0.90	0.65	2.11	1.98	1.56	2.54	1.77	1.98	0.85	0.60	0.44
2003	1.21	1.17	0.58	1.58	0.85	2.09	2.48	1.56	2.54	1.77	2.13	1.42	0.60	0.44
2004	1.17	1.98	0.42	1.58	0.85	2.59	2.48	2.13	2.67	1.73	2.33	1.46	0.60	0.44
2005	1.55	2.45	0.42	1.54	0.85	3.13	2.44	2.71	3.05	1.84	2.63	1.88	0.67	0.44
2006	2.01	2.40	0.42	2.17	0.77	3.16	3.15	3.28	3.00	1.84	2.59	2.23	0.67	0.50
2007	2.01	2.20	0.42	3.27	0.77	2.83	2.82	2.86	2.67	1.92	2.30	1.71	0.63	0.50
2008	2.26	2.34	0.42	3.31	0.81	2.96	3.08	2.90	2.64	1.83	2.55	2.05	0.63	0.50
2009	2.69	2.58	0.42	3.85	0.98	4.07	3.25	3.69	3.06	2.08	2.66	2.16	1.13	0.50
2010	2.50	2.60	0.42	3.35	1.10	4.03	3.21	3.15	3.02	2.33	2.77	2.22	1.20	1.17
2011	3.34	2.53	0.38	3.67	1.35	3.98	3.48	3.70	3.14	2.33	2.68	2.43	1.26	1.17
2012	3.72	2.47	0.38	3.42	2.04	3.85	3.43	3.57	2.92	2.13	2.63	2.05	1.30	1.17
2013	4.07	—	0.38	3.36	1.99	—	—	3.50	3.11	—	—	—	1.30	1.08
2014	2.67	—	0.38	3.28	2.10	—	—	3.54	3.07	—	—	—	1.28	1.08
2015	3.17	—	0.54	3.28	2.16	—	—	3.58	3.13	—	—	—	1.82	1.08



Country:	Italy	Japan	South Korea	South Africa	Netherlands	Norway	Poland	Russia	Spain	Sweden	Switzerland	Turkey	UK	USA
Year														
1990	0.96	1.13	0.50	0.44	1.67	0.60	0.65	—	0.79	0.90	2.00	0.46	0.96	0.58
1991	1.00	1.13	0.63	0.44	1.42	1.15	0.79	—	0.96	0.69	2.00	0.21	0.96	0.88
1992	1.42	1.13	0.63	0.48	1.17	1.33	0.83	—	0.96	1.69	2.00	0.46	0.96	0.63
1993	1.48	1.13	0.69	0.48	1.23	1.19	0.88	0.33	1.02	1.25	2.06	0.46	1.02	0.75
1994	1.48	1.23	0.69	0.48	1.27	0.98	0.88	0.33	1.44	1.29	2.06	0.46	0.81	1.00
1995	1.48	1.31	0.69	0.48	1.27	1.02	0.88	0.33	1.44	1.04	2.06	0.50	0.81	1.17
1996	1.48	1.33	0.75	0.48	1.23	1.02	0.88	0.33	1.56	1.04	2.06	0.50	0.81	1.13
1997	1.56	1.33	0.75	0.48	1.52	1.06	0.88	0.52	1.56	1.04	2.06	0.50	0.81	1.17
1998	1.56	1.33	0.75	0.52	1.56	1.06	0.92	0.52	1.73	1.25	2.06	0.50	0.81	1.21
1999	1.56	1.52	0.81	0.48	1.52	1.02	0.92	0.52	2.06	1.21	2.06	0.50	0.81	1.21
2000	1.48	1.58	0.81	0.44	1.35	1.15	0.92	0.52	2.15	2.15	1.94	0.65	0.94	1.17
2001	1.35	1.58	1.10	0.44	1.74	1.10	1.19	0.52	2.19	2.06	1.94	0.65	0.94	1.17
2002	1.35	1.58	1.10	0.44	1.78	1.67	1.19	0.52	2.19	2.58	1.94	0.69	1.10	1.30
2003	1.42	1.65	2.02	0.44	2.20	1.42	1.19	0.65	2.19	2.43	1.94	0.69	1.73	1.30
2004	1.49	1.90	2.33	0.44	1.90	1.42	1.27	0.65	2.75	2.75	1.69	0.88	1.73	1.05
2005	2.22	1.67	2.90	0.40	2.80	1.88	2.13	0.65	2.96	2.71	2.38	0.83	2.23	1.09
2006	2.72	1.63	2.96	0.52	2.80	2.13	2.26	0.65	2.96	3.03	2.13	1.50	2.29	2.13
2007	2.34	1.69	2.96	0.52	2.64	2.05	2.08	0.65	2.75	2.70	2.13	1.50	1.95	2.34
2008	2.6	1.69	3.38	0.48	3.23	2.34	2.26	0.60	2.70	2.92	2.67	1.50	2.40	2.47
2009	2.73	1.73	3.52	1.52	3.69	3.19	2.96	0.60	3.00	3.34	3.19	1.54	2.58	2.93
2010	2.84	2.03	3.52	1.75	4.13	3.19	2.96	0.60	2.72	3.09	3.33	2.06	3.62	2.68
2011	2.79	2.96	3.44	1.71	3.51	3.19	2.96	0.60	2.85	3.23	3.29	2.21	3.47	2.47
2012	2.77	3.50	2.63	0.71	3.63	3.26	2.58	0.60	2.22	3.10	3.29	1.83	3.29	3.17
2013	3.21	3.08	2.70	0.71	—	—	—	0.85	—	—	—	1.92	3.77	2.67
2014	3.21	3.08	2.74	0.71	—	—	—	0.85	—	—	—	1.92	3.72	2.58
2015	3.28	3.17	3.07	0.71	—	—	—	0.92	—	—	—	1.92	3.83	2.69

**Table A.2**

Extension of Table 4

	<i>Panel A: Without US Firms</i>				<i>Panel B: With US Firms</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPS	0.105** (2.48)	0.132*** (3.25)	0.124*** (2.90)	0.070* (1.78)	0.203*** (4.33)	0.200*** (4.67)	0.198*** (4.18)	0.194*** (4.84)
<b>Borrower Characteristics</b>								
Firm Size		0.122** (2.24)				0.070 (1.48)		
Operating Profit		-1.722*** (-9.36)				-2.061*** (-18.54)		
Leverage		0.674*** (8.46)				0.651*** (24.80)		
Asset Tangibility		-0.258*** (-3.92)				-0.264*** (-7.58)		
<b>Loan Characteristics</b>								
Loan Amount			-0.000 (-0.77)				-0.001 (-1.54)	
Loan Maturity			0.098*** (4.27)				-0.046** (-1.97)	
Term Loan			0.469*** (3.79)				0.118** (2.55)	
<b>Country Characteristics</b>								
GDP growth%				-0.031*** (-2.86)				-0.004 (-0.30)
Inflation Rate				0.020*** (3.29)				0.020*** (2.88)
Political Stability				-0.237** (-2.51)				-0.385*** (-4.87)
Anti-Corruption				-0.184 (-1.57)				-0.199* (-1.78)
Constant	4.711*** (38.82)	4.597*** (32.44)	3.769*** (16.03)	6.013*** (21.02)	5.010*** (97.49)	4.947*** (101.41)	5.070*** (46.43)	5.424*** (27.29)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,347	6,297	6,101	5,851	42,630	42,246	41,063	35,131
Adj. R <sup>2</sup>	0.517	0.550	0.526	0.491	0.352	0.436	0.359	0.358

In this table, we regress loan spread on EPS without including the control variables and sequentially add them, building up to the specification reported in [Table 4](#).

**Table A.3**

Extension of Table 5

	<i>Panel A: Without US Firms</i>				<i>Panel B: With US Firms</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	-0.293 <sup>***</sup>	-0.256 <sup>**</sup>	-0.304 <sup>***</sup>	-0.324 <sup>***</sup>	-0.655 <sup>***</sup>	-0.586 <sup>***</sup>	-0.641 <sup>***</sup>	-0.527 <sup>***</sup>
	(-2.66)	(-2.15)	(-2.75)	(-2.72)	(-13.29)	(-13.56)	(-13.40)	(-8.28)
Post	0.629 <sup>***</sup>	0.729 <sup>***</sup>	0.669 <sup>***</sup>	0.411 <sup>***</sup>	0.348 <sup>***</sup>	0.421 <sup>**</sup>	0.372 <sup>***</sup>	0.245 <sup>***</sup>
	(4.85)	(4.89)	(3.68)	(3.39)	(26.18)	(34.13)	(25.21)	(5.33)
Treated*Post	0.348 <sup>**</sup>	0.329 <sup>**</sup>	0.361 <sup>**</sup>	0.239 <sup>**</sup>	0.524 <sup>**</sup>	0.466 <sup>**</sup>	0.517 <sup>**</sup>	0.438 <sup>**</sup>
	(6.10)	(5.67)	(6.13)	(3.64)	(8.36)	(7.73)	(8.27)	(8.01)
<b>Borrower Characteristics</b>								
Firm Size		0.117 <sup>**</sup>				0.075		
		(2.11)				(1.47)		
Operating Profit		-1.718 <sup>***</sup>				-2.062 <sup>***</sup>		
		(-9.17)				(-18.60)		
Leverage		0.634 <sup>***</sup>				0.642 <sup>**</sup>		
		(8.19)				(24.34)		
Asset Tangibility		-0.244 <sup>***</sup>				-0.251 <sup>***</sup>		
		(-3.69)				(-7.24)		
<b>Loan Characteristics</b>								
Loan Amount			-0.000				-0.001	
			(-0.87)				(-1.55)	
Loan Maturity			0.100 <sup>***</sup>				-0.044 <sup>*</sup>	
			(4.37)				(-1.85)	
Term Loan			0.413 <sup>***</sup>				0.111 <sup>**</sup>	
			(3.07)				(2.38)	
<b>Country Characteristics</b>								
GDP growth%				-0.029 <sup>***</sup>				-0.007
				(-2.75)				(-0.62)
Inflation Rate				0.020 <sup>***</sup>				0.021 <sup>***</sup>
				(3.31)				(3.18)
Political Stability				-0.122				-0.232 <sup>**</sup>
				(-1.27)				(-3.31)
Anti-Corruption				-0.101				-0.100
				(-0.84)				(-1.01)
Constant	4.938 <sup>***</sup>	4.835 <sup>***</sup>	4.075 <sup>***</sup>	5.520 <sup>***</sup>	5.128 <sup>***</sup>	5.062 <sup>***</sup>	5.183 <sup>***</sup>	5.456 <sup>***</sup>
	(34.20)	(30.41)	(15.30)	(18.92)	(120.86)	(125.04)	(50.29)	(29.96)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,347	6,297	6,101	5,851	42,630	42,246	41,063	35,131
Adj. R <sup>2</sup>	0.522	0.554	0.531	0.493	0.356	0.439	0.363	0.361

In this table, we estimate our DiD model without including the control variables and sequentially add them, building up to the specification reported in [Table 5](#).

**Table A.4**

EPS and Cost of Bank Loans Using Matched Sample

	Without US firms		With US firms	
	Top-Bottom 20%	Top-Bottom 30%	Top-Bottom 20%	Top-Bottom 30%
EPS	2.979*** (4.23)	0.210* (1.96)	0.116* (1.73)	0.122** (2.55)
<b>Borrower Characteristics</b>				
Firm Size	0.323 (0.55)	-0.459* (-1.81)	-1.143*** (-3.11)	-0.348*** (-4.34)
Operating Profit	-0.094 (-0.11)	-1.129** (-2.13)	-2.647*** (-5.84)	-2.692*** (-10.47)
Leverage	1.624*** (3.05)	1.508*** (6.49)	0.564*** (7.08)	0.614*** (10.73)
Asset Tangibility	0.039 (0.08)	-0.137 (-0.64)	-0.231*** (-4.07)	-0.254*** (-3.06)
<b>Loan Characteristics</b>				
Loan Amount	-0.054* (-1.87)	0.002 (1.65)	-0.045 (-1.23)	-0.011 (-0.94)
Loan Maturity	0.176 (1.63)	0.145*** (3.01)	0.005 (0.10)	-0.044 (-1.14)
Term Loan	0.410 (1.53)	0.522** (2.48)	0.050 (0.27)	0.084 (0.73)
<b>Country Characteristics</b>				
GDP growth%	-0.068 (-0.82)	-0.013 (-0.31)	-0.025 (-1.01)	-0.055*** (-3.04)
Inflation Rate	-0.203 (-1.31)	0.096** (2.02)	0.055*** (3.05)	0.064*** (4.70)
Political Stability	0.605 (0.56)	0.056 (0.25)	-0.493*** (-3.36)	-0.249** (-2.34)
Anti-Corruption	0.754 (0.37)	-0.184 (-0.55)	-0.426** (-2.27)	-0.195 (-1.25)
Constant	-9.703** (-2.29)	3.548*** (4.82)	6.162*** (16.96)	5.857*** (19.98)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes
Observations	423	1,349	8,725	17,781
Adj. R <sup>2</sup>	0.735	0.658	0.529	0.502

While these environmental regulations are imposed on firms by governments and in that sense can be viewed as exogenous to companies, an argument can be made that firms in countries that make their environmental regulations more stringent might be fundamentally different from others, and therefore we may face selection bias. To address this concern, in the spirit of propensity score matching, we conduct our analysis on a matched sample. Using a set of observable covariates, including cash, FCF, sales growth, firm size, leverage, 2 digit industry SIC code, market to book ratio, firm age, dividend dummy, R&D, and operating profit, we matched firms associated with EPS scores in the top 30<sup>th</sup> and 20<sup>th</sup> percentiles of EPS distribution with those in the bottom 30<sup>th</sup> and 20<sup>th</sup> percentiles. Conducting the analysis on the matched sample, we confirm our earlier finding that stronger environmental regulation is associated with a higher cost of bank loans (results reported in Appendix E). Matching variables include cash, FCF, sales growth, asset size, leverage, industry, market-to-book ratio, age of the company, dividend, R&D, and operating cash flow. We use a logit model for our matching and then use the matched sample to conduct our analysis and verify previous results.

**Table A.5**

Credit Rating: Only US firms	
EPS	0.151*** (3.73)
Firm Size	-1.299*** (-3.48)
Operating Profit	-2.578*** (-9.83)
Leverage	0.790*** (6.55)
Asset Tangibility	0.667** (2.41)
Cash	1.078*** (4.63)
Market/Book	0.000 (0.09)
Political Stability	-0.145*** (-3.86)
Constant	4.362*** (34.99)
Year FE	Yes
Industry FE	Yes
Firm FE	Yes
SE Cluster	Firm
Observations	11,077
Adj. R <sup>2</sup>	0.854

Dependent variable is credit rating index for U.S. firms that ranges from 1(highest rating quality) to 9(lowest rating quality). Definitions of all control variables are provided in Appendix A. Year, industry, and country dummies are included but not reported for brevity. The numbers in parentheses are *t*-statistics. Standard errors are clustered by firm. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table A.6****Financial Constraint without Oil & Gas**

	<i>Without US Firms</i>		<i>With US Firms</i>	
	High	Low	High	Low
EPS	0.179*** (4.31)	-0.028 (-0.49)	0.224*** (5.83)	0.037 (0.77)
<b>Borrower Characteristics</b>				
Firm Size	0.061 (0.90)	-0.704** (-2.45)	-0.009 (-0.18)	-0.761** (-2.56)
Operating Profit	-1.334*** (-5.02)	-2.329*** (-5.24)	-1.793*** (-17.19)	-2.838*** (-15.34)
Leverage	0.647*** (7.07)	0.716*** (4.61)	0.569*** (19.23)	0.275*** (7.21)
Asset Tangibility	-0.153 (-1.64)	-0.244** (-2.38)	-0.198*** (-7.12)	-0.052 (-0.88)
<b>Loan Characteristics</b>				
Loan Amount	-0.000 (-0.07)	-0.002 (-1.25)	-0.000 (-0.76)	-0.005** (-2.24)
Loan Maturity	0.087*** (3.25)	0.120*** (3.14)	-0.029 (-1.30)	-0.009 (-0.30)
Term Loan	0.708*** (3.04)	0.248** (2.17)	0.176*** (3.52)	0.228*** (2.70)
<b>Country Characteristics</b>				
GDP growth%	-0.039*** (-3.58)	-0.025 (-1.50)	-0.010 (-0.88)	-0.010 (-0.74)
Inflation Rate	0.026*** (3.94)	0.059*** (4.38)	0.023*** (3.17)	0.052*** (4.17)
Political Stability	-0.166* (-1.72)	-0.185 (-1.27)	-0.378*** (-4.53)	-0.192* (-1.91)
Anti-Corruption	0.009 (0.07)	-0.133 (-0.62)	-0.023 (-0.19)	-0.359*** (-2.74)
Constant	4.186*** (9.06)	4.694*** (9.83)	5.209*** (19.53)	5.587*** (19.26)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Loan Type & Purpose FE	Yes	Yes	Yes	Yes
Observations	3,197	2,037	18,377	13,065
Adj. R <sup>2</sup>	0.575	0.548	0.449	0.490
p-value of $\chi^2$ test of Coeff diff		0.00		0.00

This table reports the result of a subsample analysis that excludes Oil & Gas Industry and compares the effect of EPS between firms with high and low financial constraints. All control variables are defined in Appendix A. Year, industry, country, loan type, and loan purpose dummies are included but not reported for brevity. Numbers in parentheses are *t*-statistics computed using standard errors that are clustered at the country-year level. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.