

The Corporate Compliance Function - Effects on Equity and Credit Risk

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- Corporate compliance: “... set of processes by which an organization seeks to ensure that employees and other constituents conform to applicable norms” (Miller, 2017)
 - => highly dynamic corporate function
 - => important for heavily regulated industries
 - => and those undergoing disruptive changes in consumer taste / acceptance
- Example: Financial industry
 - 10-15% of total workforce dedicated purely to regulatory compliance functions (Somananth, 2019)
 - Saw largest fines from non-compliance in last 10 years (\$1.8 billion, SAC Capital Advisors, insider trading; \$2.5 billion, five international banks, LIBOR scandal; \$9 billion, BNP Paribas, financing terrorism; tens of billions, Bank of America, subprime crisis)

- Against this background, relative lack of scientific studies surprising
 - Existing work focuses mainly on qualitative case studies or survey data (Hutter, 2001; Parker and Nielsen, 2008)
 - Often limited focus on specific compliance
 - Areas: Health and safety or environment (Coglianese and Lazer, 2003; McKendall, DeMarr, and Jones-Rikkens, 2002; Potoski and Prakash, 2005)
 - Elements: Whistleblowing facility (Read and Rama, 2003; Erkmen, Özsözgün, Caliskan, and Esen, 2014)
 - Agreement that effective compliance system must be supported by enactment into day-to-day activities, i.e. a compliance „culture“
- ⇒ This multi-faceted nature of corporate compliance makes it difficult to measure the quality of compliance
- ⇒ But this is necessary to assess the effectiveness: avoidance of non-compliance and ensuing lawsuits, fines, customer boycotts

- We evaluate the association between a firm's compliance quality (input) and the corresponding firm risk from non-compliance (outcome) for 150 German firms between 2014 and 2018
 1. Establishment of compliance quality score based on 24 compliance items (culture included)
 2. Approximation of firm risk via equity and debt-based risk measures: Need to capture both
 - Regular but comparably low compliance-based expenses (for personnel etc.)
 - Irregular but presumably very large loss from non-compliance
- We account for potential endogeneity between input and outcome (due to omitted variables or reverse causality) by
 - Consideration of a large number of control factors
 - Running two estimation procedures (system GMM and fixed-effects panel estimation with lagged dependent variable) that should give an upper and a lower bound for the estimated relation (Arellano and Bond, 1991; Blundell and Bond, 1998; Angrist and Pischke, 2009)

1. Stronger reported corporate compliance activity reduces equity-based risk but increases (short-term) credit-based risk
2. Not all compliance elements contribute to the same extent: internally-oriented elements are more conducive to reducing equity risks, externally-oriented elements appear to increase credit risks instead
3. Compliance-risk relation has increased over time but reached a maximum before the introduction of compulsory non-financial reporting in Germany
4. For financial firms, equity-risk effects of compliance are even stronger, but there are no credit-risk effects

- 150 publicly-listed German firms (DAX, MDAX, SDAX, TecDAX), 2014-2018
- Compliance score compiled from information in the annual reports (including the non-financial report)
 - Check for compliance-related items, where list of elements based on IDW PS 980 (auditing standard for compliance management systems) and on the German Corporate Governance Code
- Altogether 24 different items from different categories:
 - Objectives: code-of-conduct, compliance-based remuneration, UN Global Conduct member
 - Organization: CCO, compliance committee, compliance trainings, job rotation, whistleblowing facility (internal, external, anonymized, ombudsman), compliance-check of business partners, code-of-conduct for suppliers
 - Culture: tone-at-the-top, surveys asking for compliance culture
 - Communication und surveillance: reporting on whistleblowing and on sanctions
 - Risk: compliance-based risk assessment, internal or external compliance controls
 - Programme: IDW certification, COSO standard

Compliance Score – Market Indices

- Compliance items collected as indicator variables
- Total compliance score as simple summary of these indicator variables

DAX30	2014	2015	2016	2017	2018	Avg.(2014 - 2018)
Mean	13.8	14.17	15.1	16.4	16.3	15.13
Median	15	15	15	16	16	15
Std. Dev.	4.22	4.00	3.38	2.91	2.72	3.61
Minimum	2	2	9	12	12	2
Maximum	21	22	22	22	22	22

TecDAX	2014	2015	2016	2017	2018	Avg.(2014 - 2018)
Mean	4.10	4.97	5.48	8.03	8.48	6.21
Median	4	5	6	8	9	7
Std. Dev.	3.24	3.69	3.81	3.31	3.34	3.85
Minimum	0	0	0	0	0	0
Maximum	11	12	14	15	15	15

MDAX	2014	2015	2016	2017	2018	Avg.(2014 - 2018)
Mean	7.74	8.98	9.57	11.85	12.09	10.05
Median	8	9	10	12	12	11
Std. Dev.	4.51	4.72	4.89	3.41	3.70	4.57
Minimum	0	0	1	0	0	0
Maximum	18	17	20	20	21	21

SDAX	2014	2015	2016	2017	2018	Avg.(2014 - 2018)
Mean	4.52	5.27	6.11	8.59	9.48	6.80
Median	4	5	6	9	10	6
Std. Dev.	3.91	4.30	4.49	4.35	4.21	4.63
Minimum	0	0	0	0	0	0
Maximum	14	16	16	16	18	18

Compliance Score – Industries

- Industry split shows technology firms to lead the increase in compliance activity, followed by telecoms and financials
- Utilities hold the strongest compliance scores throughout

Industry	N	Compliance Score	Compliance Score	Compliance Score	Compliance Score	Compliance Score
		2014	2015	2016	2017	2018
Basic Materials	16	11.69	12.50	12.75	14.06	14.75
Consumer Cyclical	24	7.08	8.29	9.13	11.58	12.13
Consumer Non-Cyclical	4	8.25	9.25	12.50	11.75	13.00
Healthcare	15	7.87	8.80	9.53	11.40	11.47
Industrials	38	7.42	8.24	8.92	11.21	11.68
Technology	18	4.78	5.28	6.28	8.83	8.78
Telecommunications Services	6	6.67	8.33	8.83	11.17	12.17
Utilities	2	14.50	14.50	15.00	16.50	15.50
Financials	27	5.59	6.22	6.67	9.41	9.74

Compliance Score – Factor analysis

Variable	Factor _{Inst}	Factor _{Ext}	Factor _{Cert}	Factor _{Mgmt}	Factor _{Org}
COSO	0.1098	0.5656	0.0205	-0.0177	0.0156
UN GLOBAL CONDUCT	0.2676	0.5824	0.2672	0.1833	0.1265
IDWPS980	0.104	0.0316	0.8772	-0.0306	0.0623
CCO	0.5334	0.1053	0.128	0.1094	0.1536
C_ORG	0.4666	-0.0219	0.1149	0.3964	0.3073
BOARD	0.289	-0.0358	0.0791	-0.0405	0.6573
TRAINING	0.7634	0.1291	0.1006	0.0006	0.0666
COC	0.7177	0.0374	0.0751	-0.0217	0.0402
TONE	0.0955	0.1441	-0.0126	0.8283	0.0606
ROTATION	0.0197	0.1974	0.2111	0.1123	0.6512
RISK	0.5691	0.1017	0.2433	0.1638	0.1048
WHISTLE INT	0.6162	0.044	0.1036	0.2824	0.0974
WHISTLE EXT	0.4899	0.5444	-0.1231	0.1457	0.1797
WHISTLE OMBUD	0.1613	0.0148	0.1246	0.0604	-0.0268
WHISTLE ANON	0.6734	0.2992	-0.0636	0.1282	0.1563
WHISTLE REPORT	0.1624	0.6376	0.1363	0.0613	0.0206
CONT_INT	0.5098	-0.0091	0.1033	0.1825	0.2879
CONT_EXT	0.0812	0.1072	0.81	0.1381	0.0919
SUP	0.5678	0.3746	0.3095	0.1573	-0.1467
SUP_COC	0.4992	0.3693	0.2089	0.1799	-0.2682
CULT_CHECK	0.0046	0.2082	0.1232	0.1436	0.2303
INCENT	-0.0205	0.4271	0.1525	0.5178	0.0396
SANCT	0.4767	0.2459	0.2113	0.224	0.25
C_CULT	0.3194	-0.1195	0.188	0.5848	-0.1093

- To consider correlation structures between compliance items, we also run a factor analysis and retain 5 factors with eigenvalues >1:
 - Internally-institutionalized factor
 - Externally-oriented factor
 - Certification factor
 - Management factor
 - Organization factor

- With regard to equity-based risk, we only consider proxies for downside risk: Value-at-risk (Var, 5% quantile), Conditional value-at-risk (Cvar), Lower partial moments of the second and third order (LPM), calculated from Eikon
- For credit-based risk, we use 1 and 5 year Credit default swap (CDS) spreads, 12 and 60 months Probability of default and the Distance-to-default, all taken from the Risk Management Institute of the National University of Singapore
- Choice of control factors follows earlier research by Höpner et al (2016) and Callen et al. (2009)

Results – Compliance and Equity Risks

Panel A	FE (1) VaR	FE (2) CVaR	FE (3) LPM(0,2)	FE (4) LPM(0,3)	Panel B	Sys. GMM (1) VaR	Sys. GMM (2) CVaR	Sys. GMM (3) LPM(0,2)	Sys. GMM (4) LPM(0,3)
Lagged Dep. Var	-0.316*** (0.0472)	-0.319*** (0.0472)	-0.307*** (0.0483)	-0.315*** (0.0468)	Lagged Dep. Var	-0.313** -0.137	-0.196 (0.167)	-0.103 (0.146)	0.150 (0.126)
Compliance Score	-0.0721*** (0.0122)	-0.0762*** (0.0188)	-0.0415*** (0.00826)	-0.0450*** (0.0131)	Compliance Score	-0.102*** -0.0281	-0.127*** (0.0459)	-0.0650*** (0.0184)	-0.0713*** (0.0259)
Leverage	0.491** (0.238)	0.505 (0.365)	0.221 (0.160)	0.185 (0.253)	Leverage	0.916 -0.712	0.756 (1.118)	0.347 (0.386)	0.158 (0.377)
Sales Growth	-0.368 (0.234)	-0.637* (0.360)	-0.233 (0.158)	-0.389 (0.251)	Sales Growth	-0.519 -0.679	-0.836 (1.026)	-0.284 (0.465)	0.0449 (0.561)
Profitability	-1.076 (1.075)	-2.506 (1.655)	-1.203* (0.726)	-2.204* (1.151)	Profitability	-3.077 -3.157	-2.259 (5.015)	-1.856 (2.021)	-3.206 (2.350)
Dividend Yield	0.0872*** (0.0318)	0.145*** (0.0486)	0.0611*** (0.0214)	0.0896*** (0.0332)	Dividend Yield	0.238** -0.121	0.393* (0.205)	0.201** (0.0835)	0.327*** (0.0953)
Employees	-1.98e-06 (6.09e-06)	-3.54e-06 (9.35e-06)	-3.81e-06 (4.10e-06)	-4.05e-06 (6.50e-06)	Employees	4.48E-06 -1.32E-05	5.64e-06 (1.83e-05)	-4.73e-07 (6.08e-06)	-7.94e-06** (3.09e-06)
Constant	4.229*** (0.333)	5.951*** (0.499)	2.830*** (0.227)	3.638*** (0.338)	Constant	3.736*** -0.696	4.791*** (1.166)	2.169*** (0.443)	2.384*** (0.524)
Firm-year Obs.	592	592	592	592	Firm-year Obs.	592	592	592	592
Obs.	150	150	150	150	Obs.	150	150	150	150
R ²	0.198	0.178	0.174	0.155	χ ²	47.87	29.80	29.80	35.55

Results – Compliance and Credit Risks

Panel A	FE (1) CDS1Y	FE (2) CDS5Y	FE (3) PD12month	FE (4) PD60month	FE (5) DTD	Panel B	Sys. GMM (1) CDS1Y	Sys. GMM (2) CDS5Y	Sys. GMM (3) PD12month	Sys. GMM (4) PD60month	Sys. GMM (5) DTD
Lagged Dep. Var	-0.196*** (0.0476)	-0.124*** (0.0411)	-0.209*** (0.0489)	-0.122*** (0.0424)	-0.0708** (0.0358)	Lagged Dep. Var	0.0325 (0.112)	0.0981 (0.109)	-0.0501 (0.148)	0.1000 (0.105)	-0.00641 (0.0988)
Compliance Score	0.425*** (0.116)	0.205* (0.107)	6.89e-05*** (1.78e-05)	6.66e-05 (8.16e-05)	-0.0192 (0.0294)	Compliance Score	0.365*** (0.136)	0.215* (0.120)	8.84e-05*** (2.34e-05)	5.24e-05 (9.78e-05)	-0.0169 (0.0445)
Leverage	7.336*** (1.983)	11.80*** (1.842)	0.00105*** (0.000305)	0.00940*** (0.00141)	-3.666*** (0.497)	Leverage	7.177** (3.598)	12.53*** (4.595)	0.00181*** (0.000523)	0.00947*** (0.00339)	-4.094*** (0.931)
Sales Growth	-0.749 (2.020)	1.726 (1.857)	-0.000176 (0.000311)	0.00148 (0.00142)	-0.492 (0.500)	Sales Growth	2.535 (2.241)	5.466*** (2.036)	-0.000140 (0.000415)	0.00452*** (0.00151)	-1.086 (0.664)
Profitability	-3.479 (10.30)	-0.716 (9.525)	-0.000538 (0.00158)	-0.000338 (0.00727)	-0.764 (2.558)	Profitability	15.84 (20.44)	4.876 (29.81)	-0.000942 (0.00295)	2.87e-05 (0.0220)	-7.807 (5.210)
Dividend Yield	0.943*** (0.300)	0.533* (0.276)	0.000148*** (4.62e-05)	0.000397* (0.000211)	-0.156** (0.0752)	Dividend Yield	1.597** (0.663)	0.931* (0.541)	0.000273*** (8.58e-05)	0.000698* (0.000382)	-0.348** (0.150)
Employees	4.84e-05 (5.43e-05)	6.25e-05 (5.00e-05)	6.71e-09 (8.35e-09)	5.16e-08 (3.82e-08)	-1.02e-05 (1.36e-05)	Employees	0.000146* (7.59e-05)	0.000113* (6.58e-05)	1.53e-08 (1.11e-08)	8.19e-08* (4.73e-08)	-2.52e-05 (1.86e-05)
Market Value	-8.556*** (1.104)	-6.157*** (1.017)	-0.00133*** (0.000170)	-0.00423*** (0.000776)	1.047*** (0.275)	Market Value	-8.362*** (2.229)	-6.561*** (2.295)	-0.00133*** (0.000357)	-0.00435*** (0.00166)	1.079*** (0.379)
Risk-free Rate	-1.284 (1.434)	-1.789 (1.326)	-0.000182 (0.000221)	-0.00142 (0.00101)	-0.957*** (0.364)	Risk-free Rate	-0.928 (1.425)	-1.479 (1.601)	1.86e-05 (0.000263)	-0.00129 (0.00117)	-0.453 (0.492)
Return Volatility	5.146*** (0.734)	6.766*** (0.676)	0.000745*** (0.000113)	0.00479*** (0.000516)	-2.530*** (0.183)	Return Volatility	4.298*** (0.719)	6.412*** (0.876)	0.000598*** (0.000129)	0.00460*** (0.000637)	-2.776*** (0.267)
Constant	54.81*** (9.404)	37.82*** (8.691)	0.00862*** (0.00145)	0.0258*** (0.00663)	5.221** (2.339)	Constant	47.20*** (18.06)	35.11* (19.99)	0.00768*** (0.00292)	0.0230 (0.0143)	6.945** (3.156)
Firm-year Obs.	531	531	531	531	531	Firm-year Obs.	531	531	531	531	531
Obs.	136	136	136	136	136	Obs.	136	136	136	136	136
R ²	0.463	0.477	0.461	0.449	0.588	χ ²	162.5	295.3	153.8	230.4	251.1

- Corporate compliance activity reduces downside equity risks, particularly tail risks
 - But it seems to raise short-term debt risk
- ⇒ Indication that corporate compliance makes the firm's return distribution more platykurtic:
- Downside tail loses probability mass => benefits equity holders
 - Probability distribution also gets flatter, i.e. curvature increases => harms (short-term) debt holders

Results – Compliance Factors and Equity Risks

Panel A	FE (1) VaR	FE (2) CVaR	FE (3) LPM(0,2)	FE (4) LPM(0,3)	Panel B	Sys. GMM (1) VaR	Sys. GMM (2) CVaR	Sys. GMM (3) LPM(0,2)	Sys. GMM (4) LPM(0,3)
Lagged Dep. Var	-0.315*** (0.0475)	-0.316*** (0.0475)	-0.303*** (0.0487)	-0.312*** (0.0472)	Lagged Dep. Var	-0.341** (0.139)	-0.218 (0.180)	-0.0983 (0.154)	0.160 (0.134)
Factor _{Inst}	-0.106*** (0.0331)	-0.135*** (0.0508)	-0.0670*** (0.0224)	-0.0785** (0.0354)	Factor _{Inst}	-0.150* (0.0887)	-0.256* (0.138)	-0.134** (0.0552)	-0.166** (0.0760)
Factor _{Ext}	-0.0682 (0.127)	0.0601 (0.196)	-0.0106 (0.0862)	0.0410 (0.136)	Factor _{Ext}	-0.289 (0.341)	-0.0918 (0.541)	0.0580 (0.238)	0.259 (0.376)
Factor _{Cert}	-0.0721 (0.0951)	-0.0635 (0.146)	-0.0661 (0.0641)	-0.110 (0.102)	Factor _{Cert}	0.0267 (0.226)	0.174 (0.313)	-0.00210 (0.115)	0.00324 (0.142)
Factor _{Mgmt}	-0.189* (0.108)	-0.0947 (0.166)	-0.0729 (0.0728)	-0.0542 (0.115)	Factor _{Mgmt}	-0.271 (0.213)	-0.246 (0.343)	-0.128 (0.152)	-0.160 (0.200)
Factor _{Org}	-0.358** (0.154)	-0.545** (0.237)	-0.218** (0.104)	-0.259 (0.165)	Factor _{Org}	-0.408 (0.313)	-0.445 (0.480)	-0.225 (0.220)	-0.318 (0.273)
Controls	Yes	Yes	Yes	Yes	Controls	Yes	Yes	Yes	Yes
Firm-year Obs.	592	592	592	592	Firm-year Obs.	592	592	592	592
Obs.	150	150	150	150	Obs.	150	150	150	150
R ²	0.205	0.185	0.178	0.158	χ ²	54.29	30.96	32.96	39.06

Results – Compliance Factors and Credit Risks

Panel A	FE	FE	FE	FE	FE	Panel B	Sys. GMM	Sys. GMM	Sys. GMM	Sys. GMM	Sys. GMM
	(1)	(2)	(3)	(4)	(5)		(1)	(2)	(3)	(4)	(5)
	CDS1Y	CDS5Y	PD12month	PD60month	DTD		CDS1Y	CDS5Y	PD12month	PD60month	DTD
Lagged Dep. Var	-0.206*** (0.0479)	-0.131*** (0.0413)	-0.219*** (0.0492)	-0.130*** (0.0428)	-0.0652* (0.0360)	Lagged Dep. Var	0.0325 (0.112)	0.131 (0.110)	-0.0455 (0.151)	0.132 (0.107)	0.0166 (0.102)
Factor _{Inst}	0.689** (0.299)	0.251 (0.276)	0.000113** (4.59e-05)	3.89e-06 (0.000211)	0.0163 (0.0754)	Factor _{Inst}	0.294 (0.355)	-0.0927 (0.330)	9.93e-05** (5.04e-05)	-0.000357 (0.000278)	0.0822 (0.114)
Factor _{Ext}	1.932* (1.087)	1.759* (1.003)	0.000292* (0.000167)	0.000990 (0.000768)	-0.509* (0.273)	Factor _{Ext}	2.744* (1.557)	2.679** (1.358)	0.000674*** (0.000222)	0.00193* (0.00101)	-0.778* (0.463)
Factor _{Cert}	-1.603** (0.780)	-1.436** (0.721)	-0.000239** (0.000120)	-0.00103* (0.000551)	0.0183 (0.195)	Factor _{Cert}	0.346 (0.792)	0.843 (0.879)	1.70e-05 (0.000213)	0.000704 (0.000611)	-0.187 (0.175)
Factor _{Mgmt}	1.611* (0.901)	1.268 (0.829)	0.000250* (0.000139)	0.000892 (0.000634)	-0.195 (0.224)	Factor _{Mgmt}	1.066 (1.078)	0.880 (0.949)	-1.02e-06 (0.000156)	0.000601 (0.000695)	-0.340 (0.252)
Factor _{Org}	-0.668 (1.368)	-1.144 (1.262)	-8.95e-05 (0.000211)	-0.000627 (0.000965)	0.419 (0.343)	Factor _{Org}	1.771 (1.357)	1.286 (1.393)	0.000148 (0.000188)	0.00131 (0.00103)	0.297 (0.465)
Controls	Yes	Yes	Yes	Yes	Yes	Controls	Yes	Yes	Yes	Yes	Yes
Firm-year Obs.	531	531	531	531	531	Firm-year Obs.	531	531	531	531	531
Obs.	136	136	136	136	136	Obs.	136	136	136	136	136
R ²	0.477	0.489	0.474	0.458	0.593	χ ²	171.8	284.8	195.0	233.7	261.5

Results – Temporal Development

Fama-McBeth Regressions:

Panel A: Equity Risks	FMB	FMB	FMB	FMB	Panel B: Credit Risks	FMB	FMB	FMB	FMB	FMB
	(1) VaR	(2) CVaR	(3) LPM(0.2)	(4) LPM(0.3)		(1) CDS1Y	(2) CDS5Y	(3) PD12Month	(4) PD60Month	(5) DtD
2014	-0.0270	-0.0447	-0.0178	-0.0234	2014	0.0212	0.0885	0.000002	0.0001	-0.0347
2015	-0.0368	-0.0486	-0.0203	-0.0224	2015	0.2519	0.3788	0.00004	0.0003	-0.0780
2016	-0.0464	-0.0599	-0.0264	-0.0328	2016	0.1676	0.2570	0.00002	0.0002	-0.0743
2017	-0.0448	-0.0625	-0.0293	-0.0407	2017	0.2921	0.5105	0.00004	0.0004	-0.0970
2018	-0.0397	-0.0657	-0.0299	-0.0398	2018	0.3122	0.3835	0.00005	0.0003	-0.0477
Mean	-0.0389***	-0.0563***	-0.0248***	-0.0318***	Mean	0.209**	0.324***	2.99e-05**	0.000238***	-0.0663***

Characteristics of Compliance-Risk Effects

- Internally-institutionalized compliance activities seem to drive the equity-risk reducing effect
- Externally-oriented activities appear to drive credit-risk increasing effect
- Increasing compliance-sensitivity of risk over time

Financial Firms – Equity Risk Effects

Panel A	FE (1) VaR	FE (2) CVaR	FE (3) LPM(0,2)	FE (4) LPM(0,3)	Panel B	Sys. GMM (1) VaR	Sys. GMM (2) CVaR	Sys. GMM (3) LPM(0,2)	Sys. GMM (4) LPM(0,3)
Lag. Dep. Var	-0.338*** (0.0954)	-0.375*** (0.103)	-0.304*** (0.107)	-0.297*** (0.107)	Lagged Dep. Var	-0.339** (0.140)	-0.341*** (0.132)	-0.313** (0.124)	-0.283** (0.127)
Compliance Score	-0.130*** (0.0270)	-0.153*** (0.0410)	-0.0719*** (0.0177)	-0.0824*** (0.0238)	Compliance Score	-0.180*** (0.0284)	-0.231*** (0.0490)	-0.109*** (0.0174)	-0.130*** (0.0227)
Leverage	0.105 (0.372)	-0.479 (0.560)	-0.0394 (0.246)	-0.188 (0.330)	Leverage	-0.248 (0.367)	-0.739 (0.619)	-0.252 (0.249)	-0.323 (0.339)
Sales Growth	0.664* (0.333)	0.987* (0.503)	0.505** (0.218)	0.579* (0.292)	Sales Growth	1.221*** (0.468)	1.606* (0.856)	0.748*** (0.270)	0.798** (0.363)
Profitability	-5.523 (4.404)	-5.547 (6.663)	-3.749 (2.890)	-4.089 (3.867)	Profitability	-8.194 (8.182)	-9.985 (15.85)	-6.306* (3.683)	-6.475 (5.913)
Dividend Yield	-0.0257 (0.0714)	0.0107 (0.108)	-0.0111 (0.0477)	0.0172 (0.0631)	Dividend Yield	0.0640 (0.136)	0.0150 (0.207)	0.0351 (0.0847)	0.0759 (0.0862)
Employees	-4.93e-05 (6.75e-05)	-9.24e-05 (0.000102)	-2.72e-05 (4.44e-05)	-4.33e-05 (5.95e-05)	Employees	6.13e-05** (2.93e-05)	7.59e-05* (4.43e-05)	3.54e-05* (2.01e-05)	4.43e-05* (2.65e-05)
Constant	5.367*** (1.185)	7.962*** (1.812)	3.245*** (0.803)	4.119*** (1.070)	Constant	4.357*** (1.034)	6.379*** (1.143)	2.811*** (0.463)	3.241*** (0.537)
Firm-year Obs.	103	103	103	103	Firm-year Obs.	103	103	103	103
Obs.	27	27	27	27	Obs.	27	27	27	27
R^2	0.384	0.330	0.319	0.272	χ^2	88.41	90.72	96.14	78.28

Financial Firms – Credit Risk Effects

Panel A	FE (1)	FE (2)	FE (3)	FE (4)	FE (5)	Panel B	Sys. GMM (1)	Sys. GMM (2)	Sys. GMM (3)	Sys. GMM (4)	Sys. GMM (5)
	CDS1Y	CDS5Y	PD12month	PD60month	DTD		CDS1Y	CDS5Y	PD12month	PD60month	DTD
Lag. Dep. Var	-0.350*** (0.123)	-0.185* (0.0957)	-0.400*** (0.131)	-0.237** (0.0941)	-0.0760 (0.0972)	Lagged Dep. Var	-0.0603 (0.373)	0.00927 (0.605)	0.0298 (0.269)	0.0291 (0.569)	0.0886 (0.211)
Compliance Score	0.261 (0.231)	0.0509 (0.180)	4.42e-05 (3.71e-05)	-0.000241* (0.000133)	0.106 (0.0789)	Compliance Score	0.268 (0.871)	0.195 (0.367)	9.30e-05 (6.96e-05)	-2.60e-05 (0.000320)	0.0346 (0.0965)
Leverage	2.640 (2.921)	5.755** (2.299)	0.000369 (0.000469)	0.00504*** (0.00170)	-1.402 (0.977)	Leverage	5.068 (5.214)	8.352 (6.289)	0.00179*** (0.000648)	0.00645 (0.00471)	-1.733 (1.227)
Sales Growth	5.245** (2.504)	4.560** (1.963)	0.000809** (0.000403)	0.00357** (0.00145)	-1.573* (0.866)	Sales Growth	4.436 (5.340)	3.164 (4.005)	0.000608 (0.000406)	0.00271 (0.00272)	-1.388 (1.402)
Profitability	-46.84 (32.26)	-42.18* (24.95)	-0.00723 (0.00519)	-0.0234 (0.0185)	21.69** (10.70)	Profitability	-115.4 (219.4)	-23.88 (90.50)	-0.00981 (0.0142)	-0.0142 (0.0542)	22.58* (12.54)
Dividend Yield	0.537 (0.545)	0.123 (0.417)	8.88e-05 (8.77e-05)	0.000236 (0.000309)	-0.00496 (0.179)	Dividend Yield	1.103 (0.838)	1.017 (0.666)	0.000166 (0.000116)	0.000673 (0.000469)	-0.160 (0.347)
Employees	0.000909 (0.000571)	0.000914** (0.000443)	1.32e-07 (9.17e-08)	4.00e-07 (3.28e-07)	-2.03e-05 (0.000188)	Employees	0.000983 (0.000773)	0.00108 (0.000820)	1.70e-07** (8.25e-08)	5.23e-07 (7.80e-07)	-4.53e-05 (9.00e-05)
Market Value	-12.76*** (3.349)	-8.084*** (2.525)	-0.00206*** (0.000539)	-0.00288 (0.00187)	0.443 (1.055)	Market Value	-18.27 (11.24)	-7.902 (6.667)	-0.00439*** (0.00135)	-0.00266 (0.00778)	0.443 (1.005)
Risk-free Rate	1.332 (2.801)	0.574 (2.202)	0.000223 (0.000451)	-0.000301 (0.00163)	-0.358 (1.001)	Risk-free Rate	-0.152 (3.629)	0.0493 (3.819)	-6.70e-05 (0.000354)	0.000199 (0.00275)	-0.298 (1.281)
Return Volatility	-0.571 (1.773)	1.895 (1.364)	-0.000145 (0.000285)	0.00105 (0.00101)	-1.974*** (0.583)	Return Volatility	-2.246 (4.380)	2.023 (3.673)	-0.000784 (0.000508)	0.00117 (0.00277)	-2.344*** (0.807)
Constant	94.74*** (25.11)	56.64*** (18.85)	0.0155*** (0.00405)	0.0225 (0.0140)	4.512 (8.077)	Constant	138.0 (94.84)	46.32 (54.88)	0.0327*** (0.0108)	0.0141 (0.0579)	5.918 (8.788)
Firm-year Obs.	102	102	102	102	102	Firm-year Obs.	102	102	102	102	102
Obs.	27	27	27	27	27	Obs.	27	27	27	27	27
R ²	0.490	0.535	0.493	0.489	0.499	χ ²	71.19	62.64	50.44	53.57	107.8

- Corporate compliance activity:
 - reduces extreme risks, which benefits equity investors
 - comes at an expense that harms short-term debt investors
- Not all compliance activities are equally effective:
 - Typical elements of a compliance system drive the equity-risk reducing effect
 - Externally-oriented activities drive the credit-risk increasing effect
- Increasing compliance-sensitivity of risk over time
- Financial firms: Even stronger equity-risk reducing effect of compliance without credit risk increases

- Compliance score based on reported compliance activity
 - May over- or underestimate „true“ compliance activity
- But: European development of corporate compliance has been based on reporting issues, driven by capital markets (US: stronger focus on (accounting) regulation via FCPA, FSGO and SOX)
 - EU CSR strategy of 2011
 - European directive on non-financial reporting of 2014
 - German enactment in 2017 (for business year 2018)
- Market-based risk proxies require financial markets to be sufficiently efficient
 - Using observed fines and penalties as alternative also not feasible due to timing issues (lag between compliance breach and final sentencing) and non-detected non-compliance

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Back-up: Descriptive Statistics

	Firm-year Obs.	Mean	Std. Dev.	Minimum	Maximum
VaR (%)	745	2.90	0.91	1.20	5.46
CVaR (%)	745	4.13	1.38	1.74	8.50
LPM(0,2) (%)	745	1.87	0.61	0.84	3.81
LPM(0,3) (%)	745	2.41	0.90	1.02	5.83
CDS1Y (bp)	675	6.67	9.01	0.05	45.99
CDS5Y (bp)	675	12.65	9.40	1.20	46.24
PD12month (bp)	675	0.00095	0.00136	0.00001	0.00699
PD60month (bp)	675	0.00923	0.00702	0.00054	0.03369
DTD	675	5.84	2.86	-0.22	14.26
Leverage	749	0.63	0.24	0.12	1.46
Sales Growth	747	0.06	0.14	-0.46	0.58
Profitability	749	0.07	0.07	-0.13	0.38
Dividend Yield (%)	745	2.17	1.78	0.00	8.53
Employees	743	35748.40	83857.22	0.00	664496.00
Log(Market Capitalisation)	740	8.04	1.47	5.09	11.42
Risk-free Rate (%)	750	-0.46	0.27	-0.77	-0.05
Equity Return Volatility (%)	745	1.89	0.60	0.87	3.70

Source: