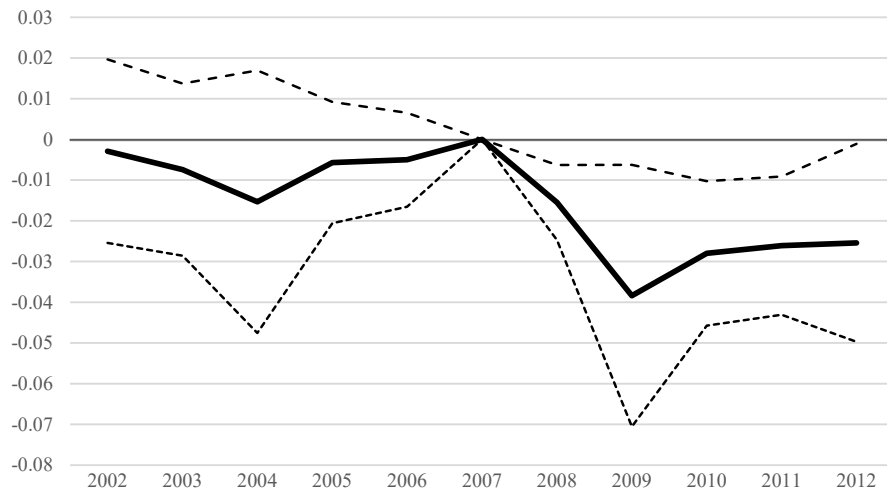# Online Appendix

for
Corporate Financial Frictions and Employee Mental Health

Dániel Kárpáti[a] and Luc Renneboog[a,b,*]

Online Appendix Figure 1: Treatment effects on log calendar days worked

Notes: Estimated treatment effects on (the log of) calendar days worked and 95% confidence interval. The dependent variable is (the log of) the sum of all days in the year when the employee had an employment contract.

Online Appendix Table 1: Worrying about job loss and antidepressant use

Dependent variable: antidepressant use (%)	(1)	(2)
Concerned about keeping job	2.190***	1.843***
	(9.36)	(7.88)
Female		2.375***
		(11.99)
Age		0.519***
		(8.30)
Age squared		-0.00447***
		(-5.89)
Has partner		-2.354***
		(-9.25)
Tenure in years		-0.0492***
		(-4.15)
Constant	4.118***	-8.332***
	(41.52)	(-6.86)
2-digit SBI 93 industry fixed effects	Yes	Yes
Unconditional mean antidepressant use (%)	4.53	4.53
# Firms (clusters)	21,436	21,436
# Observations	61,575	61,575

Notes: The table presents the relation between antidepressant use and the indicator "Concerned about keeping job" that is based on the question "Are you concerned about keeping your job? (yes/no)" from the National Labour Conditions Survey (NLCS). Antidepressant use is defined as in Table 4. In both specifications a pooled cross-sectional regression is estimated with data from 2007 to 2010. Column (1) only controls for industry fixed effects, whereas column (2) further controls for gender, age, age squared, an indicator if the person lived with a (married or unmarried) partner, and the length of the person's current employment relationship (on the 1st of January of the year). The t-statistics, reported in parentheses, are based on standard errors clustered at the firm (i.e. enterprise group) level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Online Appendix Table 2: Job separation in treated firms between 2005 and 2007

	Job separation 2005	Job separation 2006	Job separation 2007
Treated	-0.00585	-0.00891	0.00374
	(-0.23)	(-0.36)	(0.14)
Liquid assets to TA, 2007	-0.0668	-0.0497	-0.0463
	(-1.42)	(-0.75)	(-0.51)
LT debt to TA, 2007	0.0432	0.0964**	0.151**
	(1.43)	(2.24)	(2.11)
Log total assets, 2007	-0.000283	-0.00690**	-0.0112**
	(-0.11)	(-2.37)	(-2.56)
CF, 2007	0.0578	0.101	0.0812
	(0.90)	(1.16)	(0.73)
Industry fixed effects	Yes	Yes	Yes
Unconditional mean of outcome	0.133	0.232	0.325
# Enterprise groups (clusters)	325	325	325
# Observations	275,714	275,714	275,714

Notes: This table presents estimates of differential job separation rates between firms defined as Treated in our baseline specification (23 firms that had to repay at least 25% of their long-term debt in 2008) and firms defined as Control, controlling for 2-digit SBI93 industry fixed effects and financial variables measured year-end 2007. The sample includes 1 January 2005 employees of the Treated and Control firms who meet the same sample selection criteria as for Table 4 (on-call or regular job, between 20 and 60 years old, household head or partner of household head). The dependent variable (job separation) is defined as in Table 6. The t-statistics, reported in parentheses, are based on standard errors clustered at the firm (i.e. enterprise group) level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Online Appendix Table 3: Non-overlapping definitions of the treatment indicator

Post * ...	Antidepressant use (x100)		
	(1) >25%	(2) 25-30%	(3) >30%
Treated	0.440***	0.347*	0.473**
	(3.09)	(1.85)	(2.46)
Liquid assets to TA, 2007	-0.261	-0.300	-0.287
	(-0.56)	(-0.64)	(-0.61)
Cash flow, 2007	-0.470	-0.489	-0.448
	(-0.67)	(-0.60)	(-0.57)
LT debt to TA, 2007	0.637***	0.613***	0.691***
	(3.48)	(3.32)	(3.63)
Log total assets, 2007	-0.0565***	-0.0588**	-0.0618***
	(-2.66)	(-2.40)	(-2.72)
Employee f.e.	Yes	Yes	Yes
Industry * Post f.e.	Yes	Yes	Yes
2007 firm variables * Post f.e.	Yes	Yes	Yes
# Firms (clusters)	352	342	339
# Observations	2,282,057	2,077,913	2,237,766

Notes: This table presents the 2008–2012 treatment effect estimates on antidepressant use in regressions where we redefine our treatment indicator. Column 1 contains our baseline estimate. In column 2 we define Treated firms as those firms that had to repay between 25 and 30% of their long-term debt in 2008. In column 3 we define Treated firms as those firms that had to repay more than 30% of their long-term debt in 2008. The treatment definitions in columns 2 and 3 do not overlap. The t-statistics, reported in parentheses, are based on standard errors clustered at the firm (i.e. enterprise group) level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Online Appendix Table 4: Average treatment effect on antidepressant use for 2008–2012, controlling for additional variables

Post * …		Antidepressant use (x100)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Controlling for 2007 firm characteristics								
Treated	**0.440*****	**0.433*****	**0.441*****	**0.395*****	**0.513*****	**0.402*****	**0.460*****	**0.494*****
	(3.09)	**(3.18)**	**(3.04)**	**(2.88)**	**(2.85)**	**(2.94)**	**(3.14)**	**(2.75)**
ROA, 2007		0.779						1.400
		(0.54)						(0.87)
Leverage ratio, 2007			0.0199					-0.0541
			(0.09)					(-0.29)
Interest coverage, 2007				-0.00739*				-0.0100**
				(-1.69)				(-2.14)
Paid dividends, 2007					0.129			0.177
					(1.21)			(1.47)
Has bonds, 2007						0.0708		0.0702
						(0.57)		(0.53)
Public limited company, 2007							-0.0503	-0.172
							(-0.80)	(-1.58)
# Firms (clusters)	352	352	352	347	352	352	352	347
# Observations	2,282,057	2,282,057	2,282,057	2,274,954	2,282,057	2,282,057	2,282,057	2,274,954
Panel B: Controlling for additional firm characteristics								
Treated	**0.440*****	**0.517*****	**0.440*****	**0.580*****	**0.366*****	**0.529*****	**0.484*****	**0.447*****
	(3.09)	**(2.62)**	**(3.10)**	**(3.30)**	**(3.03)**	**(3.09)**	**(2.93)**	**(2.64)**
Firm at least 14 years old, 2007		-0.0317					-0.148	-0.152
		(-0.34)					(-1.56)	(-1.54)
Firm age (from tenure), 2007			0.00188					
			(0.32)					
Post * …	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Revenue growth, 2005–2007				-0.0409			-0.232	-0.238
				(-0.26)			(-1.17)	(-1.16)
Firm events, 2007					Yes		0.151	0.141
							(1.25)	(1.33)
L-T debt repayment share, 2006						-0.388	-0.401	-0.776
						(-1.01)	(-0.95)	(-1.30)
Controls from Panel A								Yes
# Firms (clusters)	352	326	352	257	218	269	159	158
# Observations	2,282,057	1,897,997	2,282,057	1,659,176	2,129,483	1,889,218	1,512,430	1,510,697
Employee fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry * Post fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2007 firm variables * Post f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table shows mean 2008–2012 treatment effect estimates of a firm having to repay at least 25% of long-term debt in 2008 (Treated) on employees' antidepressant use, based on Model (2). Antidepressant use is originally a binary variable that takes the value 1 if a person was reimbursed for (any) antidepressant use in the given year; we multiply this variable by 100 and therefore all coefficients in the table are expressed in %. The interaction of the Treated treatment indicator and the control variables with the Post indicator (which takes the value 0 in 2006–2007 and the value 1 in 2008–2012) are tabulated. All models also control for employee fixed effects, and the 2007 firm characteristics (including the industry fixed effects) from Table 4 interacted with the Post indicator. **In Panel A,** we additionally control for 2007 firm characteristics. Column 1 presents the baseline specification (as in Table 4). Columns 2 to 7 control for additional 2007 firm characteristics interacted with the Post dummy. ROA is the firm's return on assets (=net income divided by total assets); the Leverage ratio is the ratio of total long-term and short-term debt to total assets; Interest coverage is the ratio of EBIT to interest expenses; Paid dividends is an indicator if the firm paid any dividends in 2007; Has bonds is an indicator if the firm had any bonds outstanding end-2007; Public limited company is an indicator if the firm's legal form is public limited company (N.V. in Dutch). Column 8 controls for all these characteristics. **In Panel B,** we additionally control for other firm characteristics. Some of these characteristics are based on pre-2007 data, which might be missing because some firms are not present every year in the 'Annual Statistics of Finances of Large Enterprises', while other firms might change their unique identifiers over time (e.g., due to mergers). Missing data results in reduced sample size. Column 1 repeats the baseline specification. Columns 2 to 7 control for additional firm characteristics interacted with the Post dummy. Firm at least 14 years old is an indicator that the firm's age is at least 14 based on Statistics Netherlands' firm registry (firm age is censored at 14 thus we cannot control for the exact firm age); Firm age (from tenure) is an estimate of firm age that equals the tenure (in years) of the employee with the longest tenure in the firm; Revenue growth 2005–2007 is the % change in total revenues between the years 2005 and 2007; Firm events are a set of indicators of firm events (such as takeovers) in 2007 based on the National Working Conditions Survey; L-T debt repayment share 2006 is the share of long-term debt repayment obligations for the year 2007 divided by total long-term debt outstanding year-end 2006. Column 7 control for all these characteristics (besides the tenure-based firm age estimate), while Column 8 also controls for the characteristics in Panel A. The t-statistics, reported in parentheses, are based on standard errors clustered at the firm (i.e., enterprise group) level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Online Appendix Table 5: Differences in employee-level characteristics before/after regression adjustment and matching

	(1) Years of tenure	(2) Age	(3) Female	(4) Antidepr. use	(5) Dependent child	(6) No. of medicines	(7) Salary (EUR)	(8) Household income (EUR)
Panel A: no matching / no regression adjustment								
Treated	0.469	-2.496**	0.177**	0.758**	-0.0245*	0.152**	-11644***	-12291***
	(0.83)	(-2.45)	(2.12)	(2.12)	(-1.82)	(2.25)	(-4.27)	(-4.99)
Panel B: no matching / regression adjustment								
Treated	0.987*	1.463**	-0.0678	0.00429	0.036**	0.048	-4637*	-6965**
	(1.91)	(2.50)	(-1.50)	(0.01)	(2.06)	(0.42)	(-1.89)	(-2.20)
Number of firms	352	352	352	352	352	352	352	352
Observations	328,229	328,229	328,229	328,229	310,936	328,229	320,309	311,318
Panel C: matching / no regression adjustment								
Treated	1.840***	-0.0206	0.0431	-0.00569	-0.01	0.006	-1087	376
	(3.11)	(-0.02)	(0.37)	(-0.01)	(-0.36)	(0.63)	(-0.31)	(0.13)
Panel D: matching / regression adjustment								
Treated	0.266	0.894	-0.0355	-0.37	0.00	-0.02	-158	1348
	(0.43)	(1.21)	(-0.79)	(-1.15)	(0.12)	(-0.29)	(0.16)	(0.69)
Number of firms	68	68	68	68	68	68	68	68
Observations	69,469	69,469	69,469	69,469	65,673	69,469	67,848	65,783
Unconditional mean	8.84	41.83	0.341	4.071	0.54	1.94	35164	73501

Notes: The table shows differences between employees in treated and control firms in eight employee characteristics, pre-crisis (2007 or end-2007). In each panel, the characteristic is regressed on the treatment indicator 'Treated'. **Panel A** is based on the whole sample and there are no additional control variables in the regression (=mean differences). **Panel B** controls for the same firm-level characteristics (liquid assets to total assets, long-term debt to total assets, cash flow, log total assets, industry code) that we use in our baseline regression specifications. **Panel C** is based on a matched sample where we match treated firms to up to 3 control firms (with replacement). We exact match on the same industry codes that we use in our baseline regressions and use nearest-neighbor matching based on the Mahalanobis distance measure on the four firm financial characteristics. The regressions in Panel C does not control for these characteristics. **Panel D** is based on the same matched sample as Panel C, but it also controls for the four firm characteristics and the industry fixed effects, as a form of regression adjustment. 'Dependent child' (col 5) is an indicator that takes the value 1 if there is an underage child in the household of the individual, 'No. of medicines' (col 6) refers to the number of distinct medicines the individual was reimbursed for in 2007, 'Salary' (col 7) refers to the pre-tax salary from the employment relation of the individual in 2007, 'Household income' (col 8) is also pre-tax. The t-statistics, reported in parentheses, are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Online Appendix Table 6: Treatment effects on antidepressant use in matched samples

	(1)	(2)	(3)	(4)	(5)
	Antidepressant use (x100)				
*Post * ...*	Baseline	Mahala. 3	Mahala. 5	PSM 3	PSM 5
Treated	**0.440***	**0.443***	**0.460***	**0.420**	**0.449***
	(3.09)	**(3.49)**	**(3.79)**	**(2.28)**	**(2.68)**
Liquid assets to TA, 2007	-0.261	-3.009	-4.596***	-3.068	-3.222
	(-0.56)	(-1.13)	(-2.93)	(-1.19)	(-1.38)
Cash flow, 2007	-0.470	-0.148	0.915**	0.785	0.165
	(-0.67)	(-0.13)	(2.14)	(0.85)	(0.18)
LT debt to TA, 2007	0.637***	0.701*	0.937**	0.867**	0.960***
	(3.48)	(1.71)	(2.11)	(2.44)	(2.90)
Log total assets, 2007	-0.0565***	-0.0189	-0.0560	-0.085**	-0.0274
	(-2.66)	(-0.27)	(-1.14)	(-2.44)	(-0.71)
Employee f.e.	Yes	Yes	Yes	Yes	Yes
Industry f.e. * Post	Yes	Yes	Yes	Yes	Yes
Number of firms	352	68	92	69	91
Observations	2282057	483779	670544	493670	595438

Notes: The table shows mean 2008–2012 treatment effect estimates of a firm having to repay at least 25% of long-term debt in 2008 (Treated) on employees' antidepressant use, based on Model (2) of the paper. Column 1 repeats the baseline results. Columns 2 to 5 are estimated on matched sample of treated and control firms. In these matched samples, all treated firms (with any matched controls) and the matched controls of these treated firms are included. In all cases we exact match on 2-digit industry codes. Column 2 applies nearest-neighbor matching on the four firm-characteristics (liquid assets to total assets, log total assets, long-term debt to total assets, and cash flows) based on the Mahalanobis distance metric. The sample includes the 3 nearest neighbor control firms of each treated firm (with replacement). Column 3 includes the 5 nearest neighbors. Columns 4 and 5 are based on propensity score matching and include the 3 and 5 nearest neighbors of each treated firm, respectively. The t-statistics, reported in parentheses, are based on standard errors clustered at the firm level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Online Appendix Table 7: Treatment effects controlling for Collective Labor Agreements

	Antidepressant use (x100)	
*Post * ...*	(1)	(2)
Treated	**0.440***	**0.369***
	(3.09)	**(3.07)**
Liquid assets to TA, 2007	-0.261	-0.123
	(-0.56)	(-0.27)
Cash flow, 2007	-0.470	-0.437
	(-0.67)	(-0.72)
LT debt to TA, 2007	0.637***	0.609***
	(3.48)	(3.67)
Log total assets, 2007	-0.0565***	-0.0540***
	(-2.66)	(-2.71)
Collective Labor Agreement		0.304*
		(1.92)
Employee f.e.	Yes	Yes
Industry * Post f.e.	Yes	Yes
Number of firms	352	352
Observations	2,282,057	2,282,057

Notes: The table shows the mean 2008–2012 treatment effect estimates of a firm having to repay at least 25% of long-term debt in 2008 (Treated) on employees' antidepressant use, based on Model (2). Antidepressant use is a binary variable that takes the value 1 if a person was reimbursed for (any) antidepressant use in the given year; we multiply this variable by 100 and therefore all coefficients in the table are expressed in %. The interaction of the Treated treatment indicator and the control variables with the Post indicator (which takes the value 0 in 2006–2007 and the value 1 in 2008–2012) are tabulated. Column 1 repeats our baseline analysis from Table 4 . Column 2 further controls for the interaction of the Post indicator with an indicator of falling under a Collective Labor Agreement (CLA) (in 2008) that had been agreed upon prior to September 2008 and had not expired prior to January 2010. The t-statistics, reported in parentheses, are based on standard errors clustered at the firm (i.e. enterprise group) level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.