Online Appendix for

Group Affiliation and Default Prediction

William H. Beaver
Stanford Graduate School of Business
fbeaver@stanford.edu

Stefano Cascino
London School of Economics
s.cascino@lse.ac.uk

Maria Correia
London School of Economics
m.m.correia@lse.ac.uk

Maureen F. McNichols
Stanford Graduate School of Business
fmcnich@stanford.edu

Table of Contents

1. Dataset Construction

We combine several vintages of Orbis data in order to maximize coverage and to accurately identify bankruptcies. These vintages, collectively labelled by BvDEP as *Orbis Historical*, reflect the content of the Orbis database at different points in time.

We start by identifying "Global Ultimate Owners" (GUOs). As discussed by Faccio and Lang (2002), the identification of ultimate owners generally proves extremely difficult. In line with the recent study by Shroff et al. (2014), we follow the Orbis criteria to identify ultimate owners. These are independent firms where no single shareholder holds more than 25% of the shares.[1, 2] For each GUO (parent company), we then obtain subsidiary information from the Orbis ownership files. We first retrieve subsidiaries that are directly held by their respective GUOs (level 1 subsidiaries), and then we iterate this process for four additional levels (level 2, 3, 4, and 5 subsidiaries) following the sequential approach used in other studies such as Shroff et al. (2014) and Beuselinck et al. (2018). For each parent-subsidiary pair, we compute control rights using the weakest link approach (La Porta et al., 1999; Claessens et al., 2000; and Nenova, 2003). We eliminate parents and subsidiaries whose Orbis legal form is labelled as "Other legal form." This effectively excludes cooperatives from the sample.[3] We further delete firms with U.S. SIC codes 8000-9999. These include industries, such as *Museums and educational services*, *Private households*, *Membership organizations* (SIC codes 8000-8999) and *Public services* (SIC codes 9000-9999). Finally, we delete firms that do not have assets and turnover of at least U.S. $10,000 for at least one of the years 2004-2012 and with missing net income or EBIT information for all of these years.

Based on historical financial data, we build an eight-year time series of bankruptcy data (2005-2012) for each parent and subsidiary in the sample, as well as for a set of standalone (i.e., non-group-

[1] Our objective is to examine whether parent (subsidiary) financial information has incremental predictive power for subsidiary (parent) default, and therefore our analysis is necessarily limited to parent firms with available financial statement information, i.e., *corporate* ultimate owners.

[2] In untabulated tests, we check the sensitivity of our findings to alternative thresholds. Specifically, we re-map our parent-subsidiary corporate ownership chains using the two alternative thresholds of 20% and 10% used in prior studies (La Porta et al. 1999; Claessens et al., 2000; Faccio and Lang, 2002; Fan and Wong, 2002). The results of these robustness tests yield qualitatively similar inferences to those presented in the paper.

[3] The drivers of the bankruptcy decision for cooperatives might be significantly different from other types of businesses.

affiliated) firms meeting similar requirements.[4] We identify bankrupt firms using the *status* variable from Orbis.[5] In particular, we classify as bankrupt firms with the following statuses: "Active (Insolvency proceedings)," "Bankruptcy," "Dissolved," "Dissolved (bankruptcy)," "Dissolved (litigation)," "In liquidation," and "Inactive (no precision)." Because insolvency procedures and bankruptcy regulations typically vary across countries, throughout the paper we use the term bankruptcy loosely and often refer to the more generic term default. We create a bankruptcy firm-year indicator equal to one if the firm goes bankrupt (as per the above definition) in a given year. Following Shumway (2001), we delete all firm-years after bankruptcy from the sample. We use the field *status date* to identify the year in which the firm becomes bankrupt. If the status date is missing, we set it equal to the first year in which the firm status changes to bankrupt.

2. Discrete Hazard Model vs. CART

The Classification and Regression Tree (CART) methodology builds classification trees which are structured as a sequence of nodes, where the data are recursively split into more homogeneous subsets using the Gini rule. The predicted classification is determined following the path down the tree to an end node, where the path depends on the values of the different predictors.

An interesting feature of the CART methodology, *vis-à-vis* discrete hazard estimation, is the possibility to directly compare the relative contribution of each default predictor. However, the CART methodology is not free of limitations, with the main flaw being its sensitivity to small changes in the learning data. The entire tree structure can in fact change if the first splitting variable and cut-point are chosen differently, and these choices strongly depend on the distribution of observations in the learning sample. Moreover, because trees have a discrete number of end nodes, the resulting Receiver Operating Characteristic (ROC) curves are typically based on a smaller number of points compared to hazard model ROC curves which are instead based on continuous bankruptcy probability estimates. As a result of the angularity of CART-based ROC curves, the resulting Area Under the Receiver Operating Characteristic Curve (AUC) may be a less reliable statistic.

[4] Because we require lagged financial ratios for our analysis, we lose observations for the year 2004.
[5] By compiling status data from several annual editions of Orbis, we effectively construct a time-series status variable starting in 2005 and ending in 2012.

3. Default Prediction Model Validation

We compare the predictive power of different default prediction models for parent, subsidiary, and standalone firms in our *Estimation Sample* (see Table OA-2, Panel A). Following Shumway (2001), we use a discrete hazard model and include three types of observations in the estimation: non-bankrupt firms, years before bankruptcy for bankrupt firms and bankruptcy year. Our dependent variable, $Y_{i,t+1}$, is equal to one if firm i files for bankruptcy within one year $(t+1)$, and zero otherwise. We retain the first bankruptcy filing and remove from the sample all years after this filing. Furthermore, to ensure that prediction is made out-of-sample, and to avoid the potential bias of ex post over-fitting the data, we estimate coefficients using an expanding window approach. We compare four model specifications:

1) *The BCM (2012) model*, augmented by the natural logarithm of the book value of assets:

$$Pr(Y_{i,t+1}=1) = f(NROAI_{i,t}, ROA_{i,t}, LTA_{i,t}, ETL_{i,t}, LN(TA_{i,t})), \quad \text{(OA.1)}$$

where $Y_{i,t+1}$ is an indicator variable set equal to one if firm i files for bankruptcy in year $t+1$, and zero otherwise; $NROAI_{i,t}$ is an indicator variable set equal to one if firm i's return on assets in year t is negative, and zero otherwise; $ROA_{i,t}$ is firm i's return on assets in year t; $LTA_{i,t}$ is firm i's book leverage in year t, i.e., firm i's total liabilities scaled by total assets; $ETL_{i,t}$ is firm i's ratio of earnings before interest and taxes to total liabilities in year t; and $LN(TA_{i,t})$ is the natural logarithm of the book value of assets for firm i in year t.

2) *A country/industry/time varying baseline model* (i.e., equation (OA.1) augmented by the bankruptcy rate in firm i's country-industry in the year t, $BANKRATE_{i,t}$):

$$Pr(Y_{i,t+1}=1) = f(NROAI_{i,t}, ROA_{i,t}, LTA_{i,t}, ETL_{i,t}, LN(TA_{i,t}), BANKRATE_{i,t}). \quad \text{(OA.2)}$$

3) *A macro model* (i.e., equation (OA.2) augmented forecasted GDP growth and inflation for the year $t+1$):

$$Pr(Y_{i,t+1}=1) =$$
$$f(NROAI_{i,t}, ROA_{i,t}, LTA_{i,t}, ETL_{i,t}, LN(TA_{i,t}), BANKRATE_{i,t}, FGDPg_{i,t}, FINF_{i,t}), \quad \text{(OA.3)}$$

where $FGDPg_{i,t}$ and $FINF_{i,t}$ are the last forecasts of GDP growth and inflation for firm i's country in year $t+1$ issued in year t.

4) *A model with country and industry fixed effects* (i.e., equation (OA.1) augmented by country and one-digit SIC industry indicators):

$$Pr(Y_{i,t+1} = 1) = f(NROAI_{i,t}, ROA_{i,t}, LTA_{i,t}, ETL_{i,t}, LN(TA_{i,t}), Industry\ FE, Country\ FE), \quad \text{(OA.4)}$$

where $Industry\ FE$ and $Country\ FE$ are a series of (one-digit SIC) industry and country fixed effects.

Table OA-1, Panel A presents descriptive statistics for the variables used in these four models. Parents are on average more profitable and have lower leverage than subsidiaries (they exhibit lower incidence of losses, $NROAI_{i,t}$, higher $ROA_{i,t}$ and lower $LTA_{i,t}$ on average). Subsidiaries, despite having lower $ROA_{i,t}$ and higher $LTA_{i,t}$, have higher earnings relative to total liabilities, as measured by $ETL_{i,t}$. Standalones have on average lower book value of assets and higher $ROA_{i,t}$ and $ETL_{i,t}$ than both parents and subsidiaries. Consistent with the observed financial ratios, subsidiaries exhibit the highest bankruptcy rates out of the three groups of firms (1.17%), followed by parents (0.87%) and standalones (0.51%).

Panel B presents the coefficients from the estimation of models (OA.1) to (OA.4). These models are estimated separately for parents, subsidiaries and standalones. Across the four models, parents and subsidiaries with low profitability, losses and high leverage are more likely to file for bankruptcy in the following year. While $ETL_{i,t}$ is not significant in the parent model, it is significantly negative for subsidiaries, as expected. $LTA_{i,t}$, $ROA_{i,t}$ and $LN(TA_{i,t})$ are the main predictors of standalone bankruptcy, with size exhibiting a positive coefficient, in contrast to the coefficient documented for parents and subsidiaries. While not statistically significant, the coefficient on the country-industry bankruptcy rate is positive. Forecasted GDP growth (forecasted inflation) exhibit positive (negative) and significant associations with future parent bankruptcy but are not statistically significant for subsidiaries and standalones. We estimate the probability that each firm in the sample files for bankruptcy within the following 12 months as follows: $\widehat{Pr(Y_{i,t+1} = 1)} = \frac{exp(X_{i,t}\hat{\beta})}{1+exp(X_{i,t}\hat{\beta})}$.

We compare the predictive power of the models using two different approaches. First, we rank the predicted probability of bankruptcy within the parent, subsidiaries and standalones sub-samples.

We report the percentage of parents, subsidiaries and standalones in each of the top three deciles separately for three groups: (1) bankruptcy years, (2) years before bankruptcy and (3) non-bankrupt firm-years. If the models were to have no predictive power, the fraction of observations in each decile would be 10% for each of the three groups. A higher percentage of bankruptcy years in the top three deciles would be indicative of higher predictive power of the model. Second, we perform a ROC curve analysis and report the AUC, which reflects the trade-off between type 1 and type 2 classification errors. A strategy that randomly classifies firm-years as bankrupt and non-bankrupt would be represented by the diagonal of the ROC graph and have an AUC of 0.5. A perfect classification strategy would be represented by a point on the upper left corner of the ROC graph (AUC=1), while a strategy that classifies all observations as "non-bankrupt" would be represented by a point in the origin of the ROC graph, and have an AUC of zero. We use these two approaches to examine predictive power as both have advantages and disadvantages. The AUC has the advantage of providing a concise measure of the relative frequency of false positives and negatives. However, it has the disadvantage of implicitly assuming a symmetric loss function by placing equal weight on the two types of errors. The decile analysis has the advantage of illustrating these errors in more detail across the distribution of the estimated probability of bankruptcy, which is informative, given that the loss function in bankruptcy classification is likely asymmetric (Beaver et al., 2010). The disadvantage of the decile analysis, however, is that it does not provide a summary measure of predictive power across the entire distribution.

Panels C and D present the results of this analysis. Column (1) presents the percentage of bankrupt firm-years that fall within the top three deciles of the predicted probability of bankruptcy for each of the four models. Columns (2) and (3) show the percentage of years before bankruptcy and non-bankrupt firm-years falling within these deciles, respectively. The AUC of the country/industry/time varying baseline model (equation (OA.2)) is higher than that of other models for subsidiaries and standalone firms. While slightly smaller than the AUC of the macro model for parents, the difference between the two is not statistically significant (Panel D). Approximately 30% (23%) of the parent (subsidiary) bankruptcy years fall into the top decile of predicted probability of bankruptcy, and 60% (50%) fall into the top three deciles. Figure OA-1, Panels A, B and C present

the ROC curves for the different models. Consistent with the reported AUC, the country/industry/time varying model appears to outperform the other three models for subsidiaries and standalone firms and the difference between that model and the other models appears negligible for parents. For the above reason, we use the country/industry/time varying baseline model (equation (OA.2)) as the main model for our analysis.

Panel E, further examines the differences in predictive power for the selected model across public and private firms. We estimate the model both within the pooled *Estimation Sample* and allowing for different coefficients for public and private firms. We find that both models have higher predictive power for public firms than for private firms, especially within subsidiaries. While we do not explore the reasons for this difference in predictive power, this could be in part due to heterogeneity in the quality of accounting information provided by public and private firms (Ball and Shivakumar (2005), for example, document that U.K. private firms exhibit lower timely loss recognition).

4. Sample Selection and Descriptive Statistics

To obtain bankruptcy probability estimates, we start from the *Estimation Sample* of parents and subsidiaries with available financial statement information (see Table OA-2: Sample Selection and Descriptive Statistics). We limit this sample to observations for which $BANKRATE_{i,t}$ is available. This requirement leaves us with 594,890 parent-year and 1,309,173 subsidiary-year observations (Table OA-1, Panel B, Columns (4) and (5)).

In order to examine the importance of group affiliation, we further limit the sample to groups with available ownership information to compute control rights. This leaves us with a final sample comprising 350,452 parent-year and 928,162 subsidiary-year observations over the period 2005-2012.[6] We refer to this sample as the *Base Model Sample* (Table OA-2, Panel A).

Table OA-2, Panel B presents the distribution of parent and subsidiary firm-year observations by country. There are 117 countries represented in the sample: France, Sweden, Spain, Italy, Russia,

[6] In line with Shroff et al. (2014) and Beuselinck et al. (2018), we choose to keep in our sample countries with very few parent and/or subsidiary firm-year observations. This is to avoid a potential "domino effect" in the sample selection procedure induced by the dropping of less populated countries (for a detailed explanation of the issue, see Beuselinck et al. (2018), footnote 13).

U.K., and Japan account for most of the parents and subsidiaries (73% and 71%, respectively).[7] Panel C (D) presents the sample distribution for the three types of firms by year (industry). Approximately 40% of the parents are in the financial industry, which suggests that many business group parents are financial holding companies. These are followed by 16% in wholesale durable goods, and 11% in services. In contrast, only 16% of subsidiaries are in the financial industry. 24% of the subsidiaries are in wholesale durable goods and 14% in services. The industry distribution of standalone firms is similar to that of subsidiaries. Panel E presents descriptive statistics for the main variables used in the default prediction model. Parents are on average more profitable and have lower leverage than subsidiaries (they exhibit lower incidence of losses, $NROAI_{i,t}$, higher $ROA_{i,t}$ and lower $LTA_{i,t}$ on average). Subsidiaries, despite having lower $ROA_{i,t}$ and higher leverage, $LTA_{i,t}$, have higher earnings before interest and tax, $ETL_{i,t}$.

5. CDS Sample

We obtain a sample of five-year credit default swap (CDS) contracts on senior unsecured debt issued by parents from Markit. We impose several data filters to ensure that we retain the most liquid CDS contract for each firm. In particular, for U.S. parents, we select U.S. Dollar denominated contracts with a no-restructuring clause for months following April 2009, and contracts with a modified restructuring clause for months before April 2009.[8] For parents in the remaining sample countries, we select the CDS contract with highest depth. This results in 3,377 parent-year observations, 3,152 (3,077) of which with available distance to default (market) information. Using similar selection criteria for the sample of subsidiaries, we obtain 1,198 subsidiary-year observations, 1,069 (509) of which have available distance to default (market) information.

[7] These cross-country differences in sample representation (which are consistent with other studies that use the Orbis database, such as Shroff et al. (2014) and Beuselinck et al. (2018)) may not only reflect differences in the number of firms in each country but also cross-country differences in reporting requirements. For example, in the U.S. only public firms are required to file their annual financial statements. To mitigate a potential concern that observations from the most represented parent and subsidiary countries in our sample may be driving our results, we conduct a battery of sensitivity tests (untabulated), where we remove parent- (subsidiary-) year observations from each of the parent (subsidiary) countries with higher sample representation both one-by-one and simultaneously. The tenor of our findings remains unchanged.

[8] A restructuring clause defines the credit events that trigger the settlement of a CDS contract. Under a modified restructuring clause, restructuring agreements count as a credit event.

References

Ball, R., and L. Shivakumar (2005). Earnings quality in U.K. private firms: comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83-128.

Beaver, W. H., M. Correia, and M. McNichols (2010). Financial statement analysis and the prediction of financial distress. *Foundations and Trends in Accounting* 5 (2): 99-173.

Beuselinck, C., S. Cascino, M. Deloof, and A. Vanstralen (2018). Earnings management in multinational corporations. Working paper. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1599678.

Claessens, S., S. Djankov, and L. Lang (2000). The separation of ownership and control in East Asian Corporations. *Journal of Financial Economics* 58: 81-112.

Faccio, M., and L. H. P. Lang (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics* 65 (3): 365-395.

Fan, J. P. H., and T. J. Wong (2002). Corporate ownership structure and the informativeness of accounting earnings, *Journal of Accounting and Economics* 33: 401-425.

Kaufmann, D., A. Kraay, and M. Mastruzzi (2009). Governance matters VII: Aggregate and individual governance indicators 1996-2009. The World Bank.

LaPorta, R., F. Lopez-de-Silanes, and A. Shleifer (1999). Corporate ownership around the world. *Journal of Finance* 54 (2): 471-517.

Leuz, C. (2010). Different approaches to corporate reporting regulation: How jurisdictions differ and why. *Accounting and Business Research* 40 (3): 229-256.

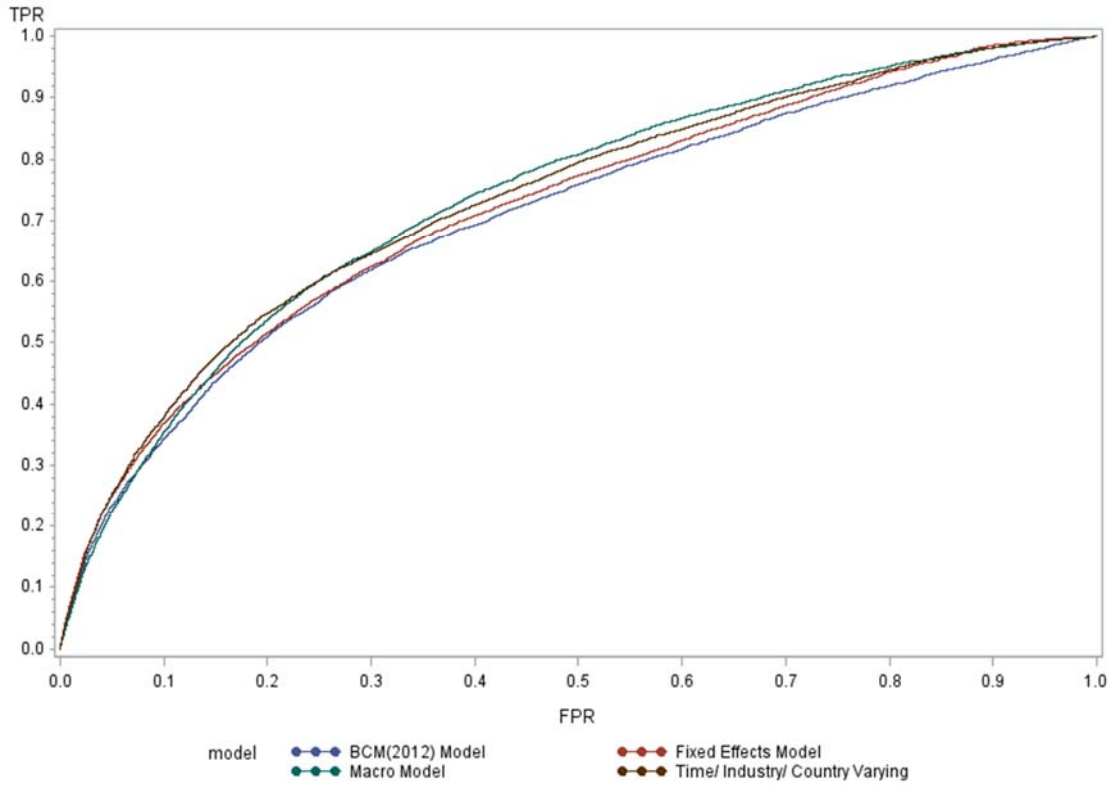
Nenova, T. (2003). The value of corporate voting rights and control: A cross-country analysis. *Journal of Financial Economics* 68: 325-351.

Shroff, N., R. Verdi, and G. Yu (2014). Information environment and the investment decisions of multinational corporations. *The Accounting Review* 89: 759-790.

Shumway, T. (2001). Forecasting bankruptcy more accurately: A simple hazard model. *The Journal of Business* 74 (1): 101-124.

Figure OA-1: Default Prediction Model Validation - ROC Curves

Panel A: Parent ROC Curves



Panel B: Subsidiary ROC Curves

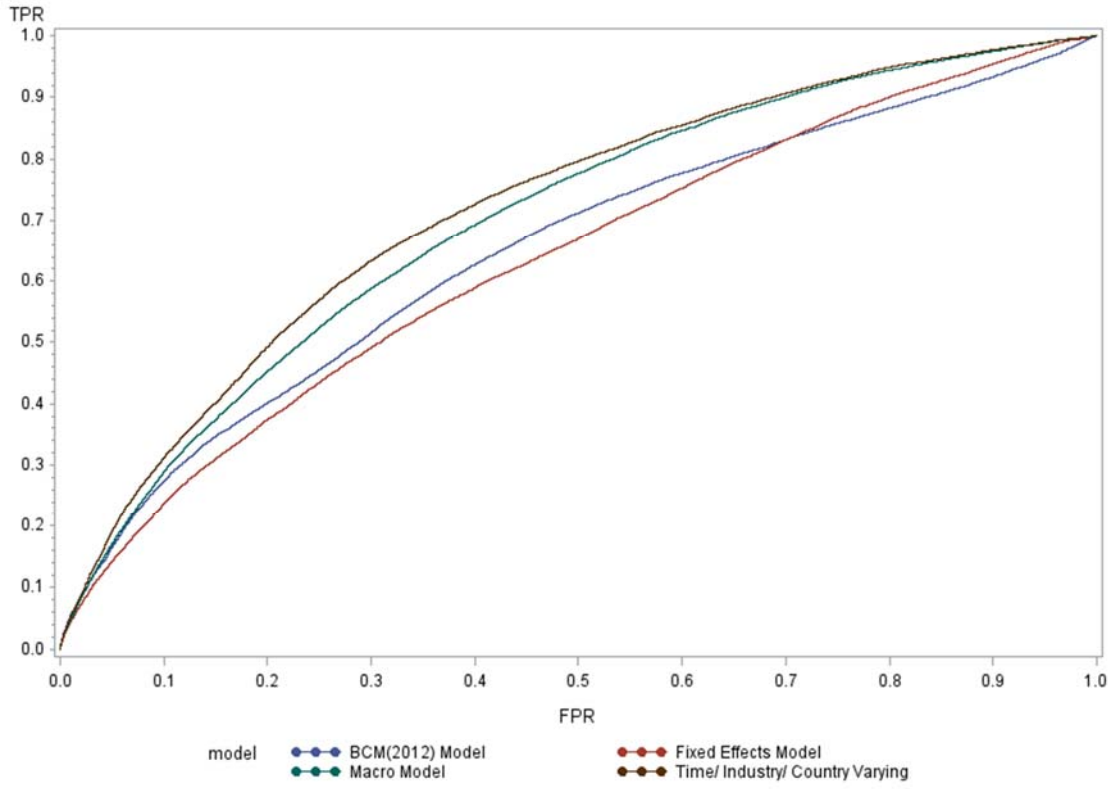
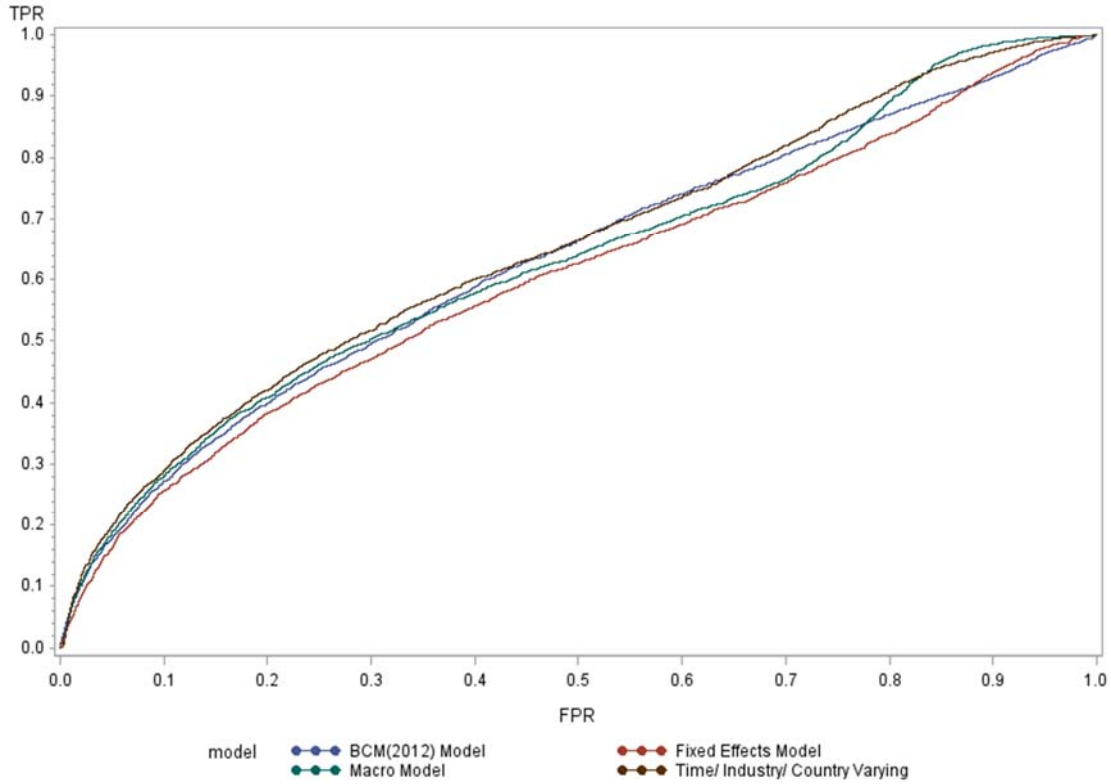


Figure OA-1 (continued)

Panel C: Standalone ROC curves

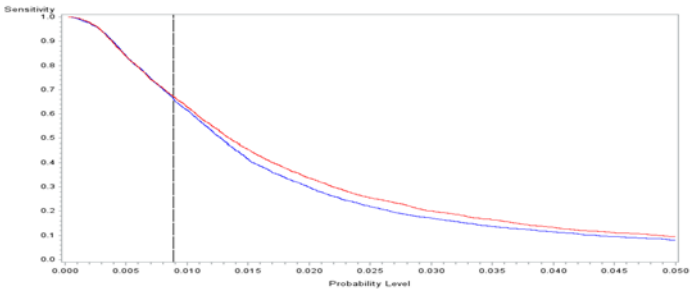


This figure shows a set of Receiver Operating Characteristic (ROC) curves. Panels A, B and C present the ROC curves for the BCM (2012) model (equation (OA.1)), the Country/Industry/Time varying baseline model (equation (OA.2)), the macro model (equation (OA.3)) and the country and year fixed effects model (equation (OA.4)), for parents, subsidiaries and standalones, respectively. FPR and TPR stand for "False Positive Rate" and "True Positive Rate," respectively.

Figure OA-2: Sensitivity and Specificity for Parent and Subsidiary Augmented Models

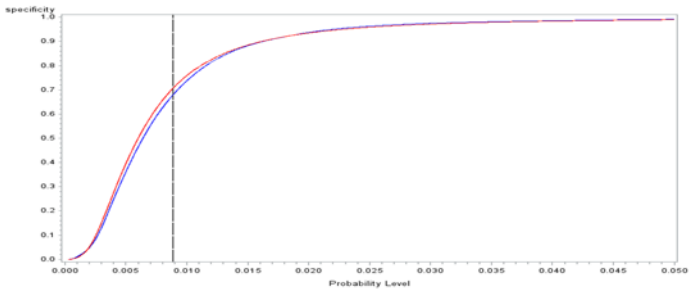
Parent Augmented Model

Sensitivity



Sensitivity base model (blue): 0.66219
Sensitivity augmented model (red): 0.67199

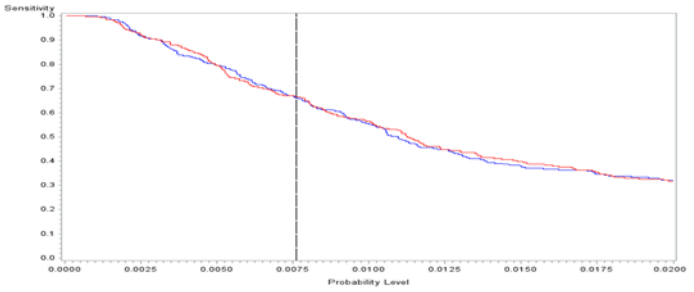
Specificity



Specificity base model (blue): 0.68044
Specificity augmented model (red): 0.70753

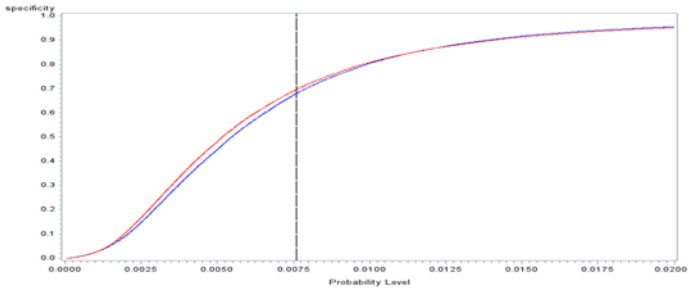
Parent Augment Model - Low Financial Reporting Quality

Sensitivity



Sensitivity base model (blue): 0.66255
Sensitivity augmented model (red): 0.66667

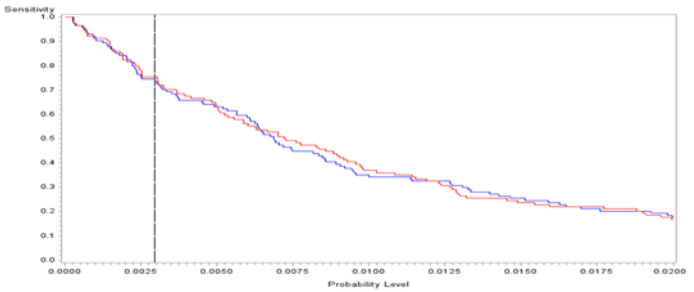
Specificity



Specificity base model (blue): 0.67957
Specificity augmented model (red): 0.69679

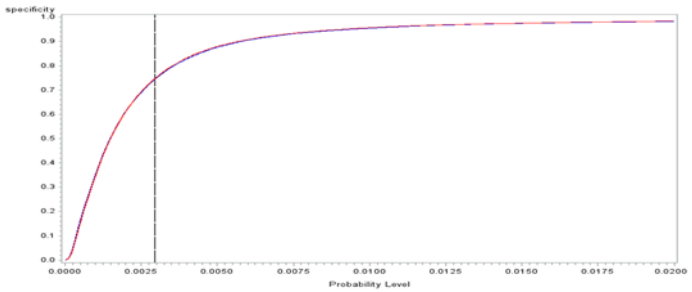
Parent Augment Model - High Financial Reporting Quality

Sensitivity



Sensitivity base model (blue): 0.73684
Sensitivity augmented model (red): 0.75439

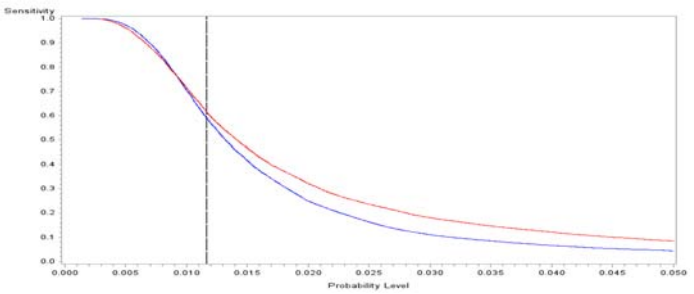
Specificity



Specificity base model (blue): 0.74508
Specificity augmented model (red): 0.74729

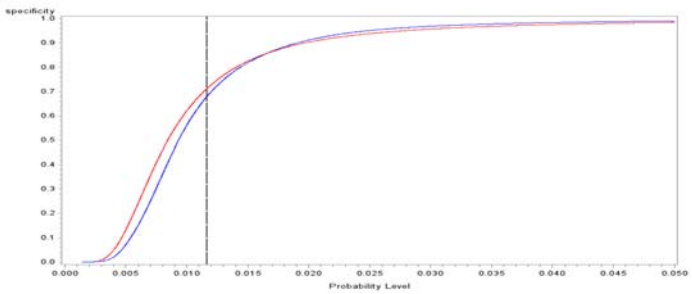
Subsidiary Augmented Model

Sensitivity



Sensitivity base model (blue): 0.73684
Sensitivity augmented model (red): 0.75439

Specificity

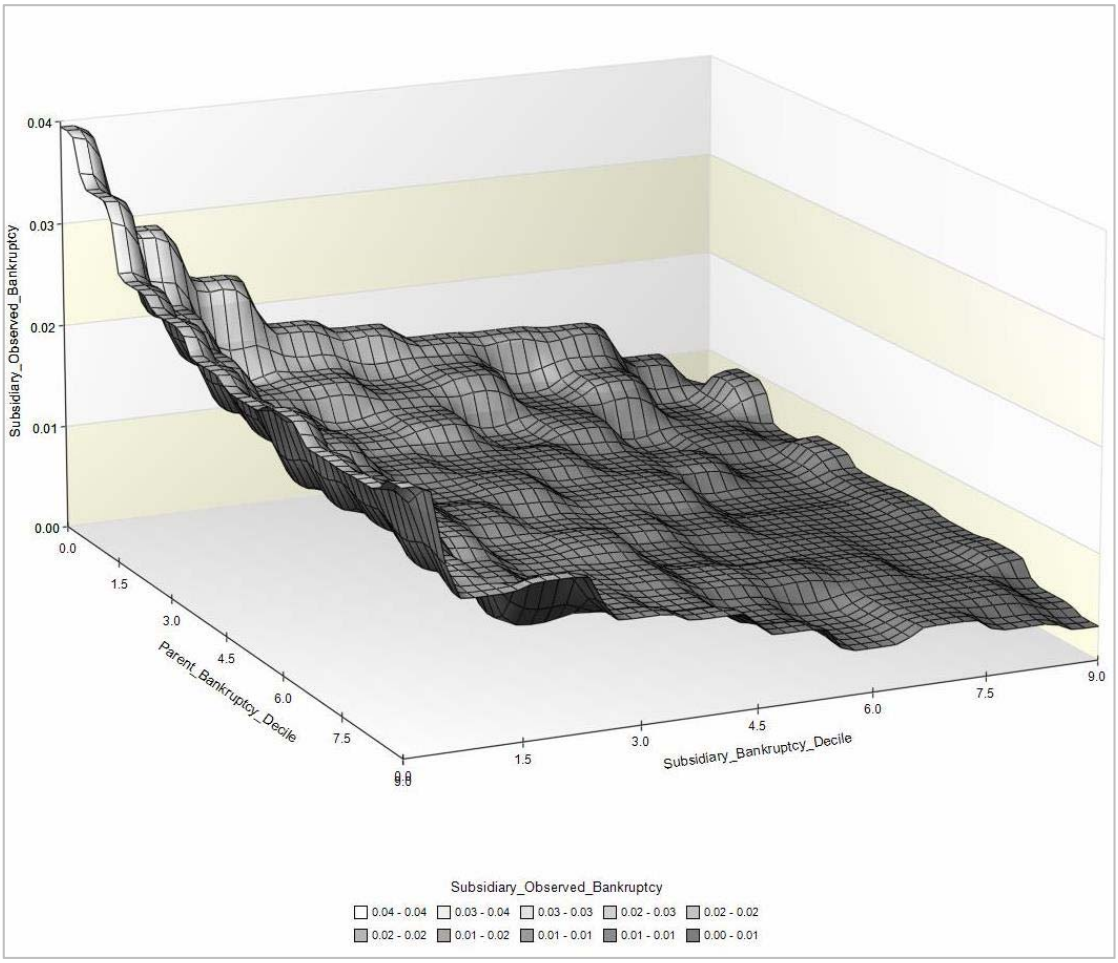


Specificity base model (blue): 0.74508
Specificity augmented model (red): 0.74729

This figure presents the sensitivity and specificity of the base (blue lines) and augmented (red lines) default prediction models for parents and subsidiaries at different probability thresholds. The parent base model as presented in Table 1, Panel A, Column (1) in the paper is estimated as follows: $Pr(Y_{p,t+1} = 1) = f(NROAI_{p,t}, ROA_{p,t}, LTA_{p,t}, ETL_{p,t}, LN(TA_{p,t}), BANKRATE_{p,t})$. The parent

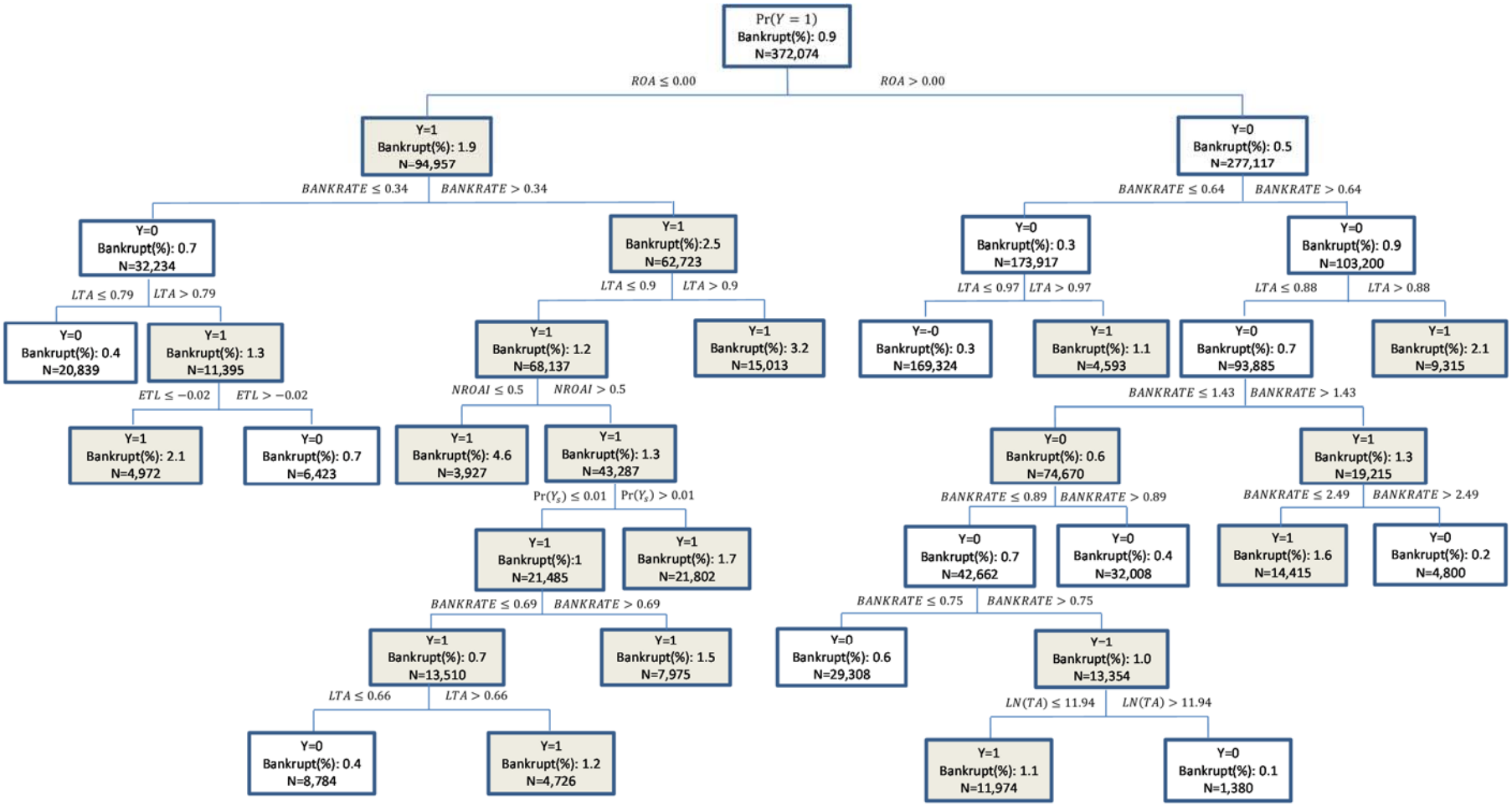
augmented model adds the average estimated bankruptcy probability of all group subsidiaries ($\overline{Pr(Y_{s,t+1})}$) to the parent base model (Table 1, Panel A, Column (2) in the paper). The subsidiary base model as presented in Table 3, Panel A, Column (1) in the paper is estimated as follows: $Pr(Y_{s,t+1} = 1) = f(NROAI_{s,t}, ROA_{s,t}, LTA_{s,t}, ETL_{s,t}, LN(TA_{s,t}), BANKRATE_{s,t})$. The subsidiary augmented model adds the estimated bankruptcy probability of the parent ($(Pr(Y_{p,t+1})$) to the subsidiary base model (Table 3, Panel A, Column (2) in the paper).

Figure OA-3: Average Subsidiary Bankruptcy Rates by Decile of Subsidiary and Parent Bankruptcy Probability



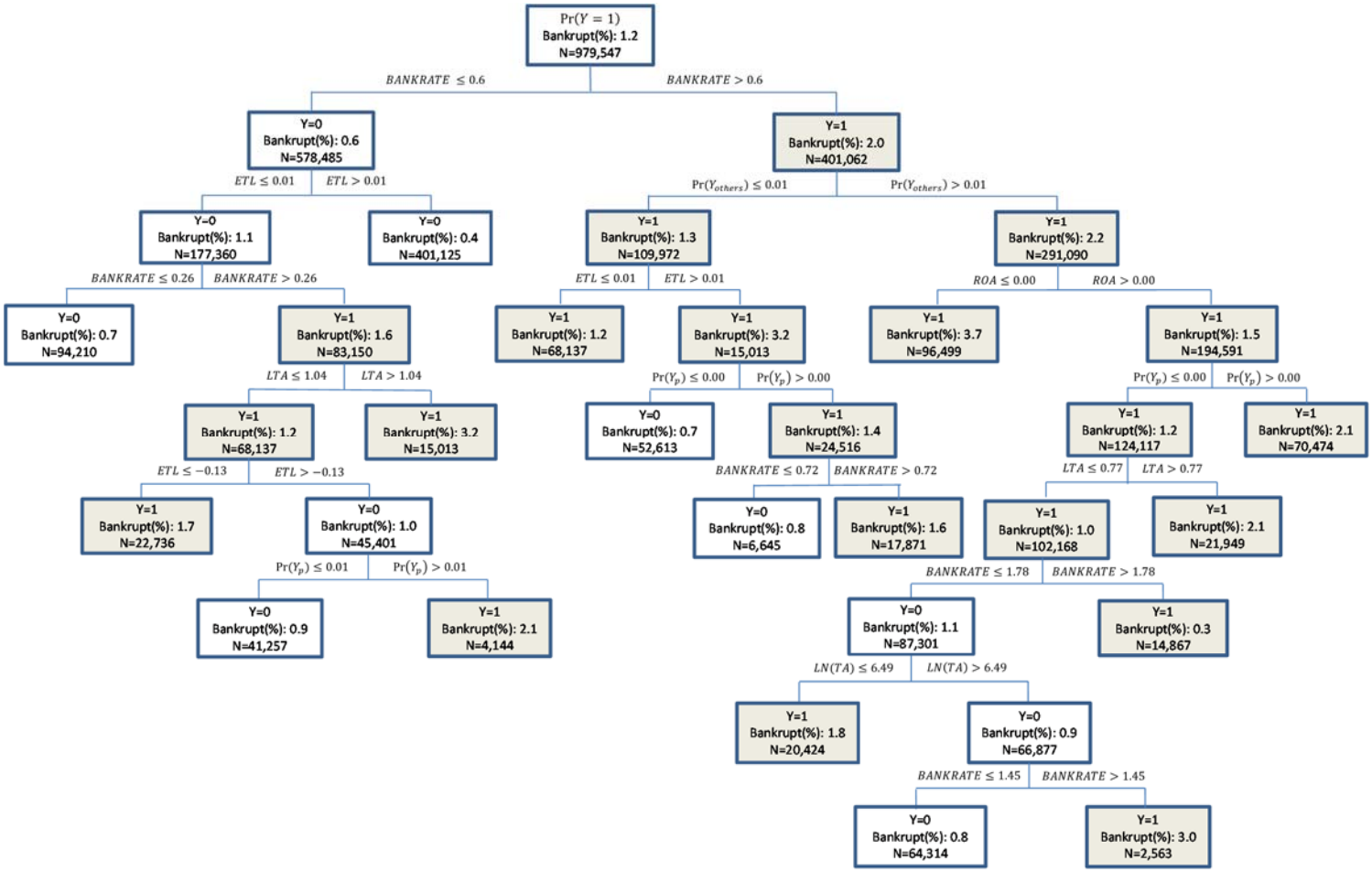
This figure depicts the association between parent and subsidiary estimated bankruptcy probabilities. Each year, we sort subsidiaries into deciles based on their estimated bankruptcy probability ($Pr(Y_{s,t+1})$) and on their parents' estimated bankruptcy probability ($Pr(Y_{p,t+1})$). These sorts are independent given that our sorting variables are correlated. We then plot the mean observed subsidiary bankruptcy rate in year $t+1$ across the resulting 100 cells.

Figure OA-4: Example of Binary Recursive Partitioning for Parents



This figure presents the Classification and Regression Tree (CART) for the parent augmented model that includes $NROAI_{p,t}$, $ROA_{p,t}$, $LTA_{p,t}$, $ETL_{p,t}$, $LN(TA_{p,t})$, $BANKRATE_{p,t}$, $\overline{Pr(Y_{s,t+1})}$, and $\bar{Y}_{s,t}$ (Table 6, Panel A, Column (2) in the paper). The tree is pruned for presentation purposes.

Figure OA-5: Example of Binary Recursive Partitioning for Subsidiaries



This figure presents the Classification and Regression Tree (CART) for the subsidiary augmented model that includes $NROAI_{s,t}$, $ROA_{s,t}$, $LTA_{s,t}$, $ETL_{s,t}$, $LN(TA_{s,t})$, $BANKRATE_{s,t}$, $Pr(Y_{p,t+1})$, $\overline{Pr(Y_{others,t+1})}$, $\overline{Y_{others,t}}$, and $Y_{p,t}$ (Table 6, Panel C, Column (2) in the paper).The tree is pruned for presentation purposes.

Table OA-1: Default Prediction Model Validation

Panel A: Descriptive Statistics

		Mean	*Std. Dev.*	*P25*	*Median*	*P75*
Parents	$Y_{i,t+1}$	0.0086	0.0921	0.0000	0.0000	0.0000
	$NROAI_{i,t}$	0.2554	0.4361	0.0000	0.0000	1.0000
	$ROA_{i,t}$	0.0468	0.1817	-0.0034	0.0267	0.0937
	$LTA_{i,t}$	0.5478	0.3223	0.2929	0.5547	0.7802
	$ETL_{i,t}$	0.0456	0.7074	-0.0143	0.0520	0.1825
	$LN(TA_{i,t})$	8.5727	2.3704	6.8985	8.3305	9.9882
	$BANKRATE_{i,t}$	0.5861	0.9667	0.1104	0.4249	0.7619
	$FGDPg_{i,t}$	0.0220	0.0169	0.0117	0.0200	0.0280
	$FINF_{i,t}$	0.0260	0.0242	0.0159	0.0190	0.0268
Subsidiaries	$Y_{i,t+1}$	0.0117	0.1074	0.0000	0.0000	0.0000
	$NROAI_{i,t}$	0.2720	0.4450	0.0000	0.0000	1.0000
	$ROA_{i,t}$	0.0378	0.1775	-0.0075	0.0250	0.0926
	$LTA_{i,t}$	0.6798	0.3841	0.4360	0.6851	0.8821
	$ETL_{i,t}$	0.1441	0.4701	-0.0063	0.0614	0.2140
	$LN(TA_{i,t})$	8.4468	2.2784	6.8741	8.3305	9.9087
	$BANKRATE_{i,t}$	0.6433	1.1398	0.1642	0.4249	0.8230
	$FGDPg_{i,t}$	0.0202	0.0160	0.0112	0.0182	0.0270
	$FINF_{i,t}$	0.0250	0.0971	0.0159	0.0190	0.0259
Standalones	$Y_{i,t+1}$	0.0051	0.0713	0.0000	0.0000	0.0000
	$NROAI_{i,t}$	0.2728	0.4454	0.0000	0.0000	1.0000
	$ROA_{i,t}$	0.0541	0.2075	-0.0054	0.0194	0.0880
	$LTA_{i,t}$	0.6491	0.3867	0.3662	0.6658	0.8923
	$ETL_{i,t}$	0.2618	0.8952	-0.0001	0.0628	0.2355
	$LN(TA_{i,t})$	6.4664	1.8788	5.2721	6.5972	7.7619
	$BANKRATE_{i,t}$	0.6943	1.8002	0.1040	0.4108	0.7977
	$FGDPg_{i,t}$	0.0247	0.0220	0.0091	0.0200	0.0408
	$FINF_{i,t}$	0.0363	0.0311	0.0169	0.0217	0.0400

Table OA-1 (continued)

Panel B: Coefficients

	Dependent variable: $Y_{i,t+1}$											
	BCM (2012) Model			Country/Industry/Time varying baseline			Macro Model			Fixed Effects Model		
	Parents	*Subsidiaries*	*Standalones*	*Parents*	*Subsidiaries*	*Standalones*	*Parents*	*Subsidiaries*	*Standalones*	*Parents*	*Subsidiaries*	*Standalones*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-5.322***	-4.083***	-7.203***	-5.507***	-3.990***	-7.794***	-5.358***	-3.973***	-7.456***	-5.451***	-4.009***	-7.209***
	(-21.33)	(-7.68)	(-9.08)	(-19.42)	(-7.88)	(-9.35)	(-18.79)	(-10.76)	(-14.80)	(-21.62)	(-8.43)	(-7.68)
$NROAI_{i,t}$	0.446***	0.266***	0.047	0.459***	0.279***	0.054	0.397***	0.277***	0.034	0.461***	0.258***	0.110
	(3.72)	(4.09)	(0.18)	(4.03)	(5.13)	(0.17)	(3.88)	(7.44)	(0.11)	(3.98)	(3.41)	(0.49)
$ROA_{i,t}$	-0.845***	-0.787***	-1.275***	-0.943***	-0.837***	-1.522***	-1.016***	-0.838***	-1.550***	-0.996***	-0.818***	-1.274**
	(-3.02)	(-7.46)	(-2.66)	(-3.26)	(-7.21)	(-3.08)	(-3.84)	(-7.07)	(-2.91)	(-3.43)	(-10.56)	(-2.56)
$LTA_{i,t}$	1.390***	0.393***	1.059***	1.455***	0.396***	1.178***	1.409***	0.394***	1.188***	1.355***	0.388***	1.042**
	(11.25)	(4.48)	(2.64)	(10.86)	(4.60)	(2.66)	(10.65)	(4.66)	(2.62)	(10.78)	(4.26)	(2.34)
$ETL_{i,t}$	0.009	-0.241***	0.018	0.028	-0.211***	0.050	0.021	-0.210***	0.082	-0.041	-0.235***	0.043
	(0.11)	(-3.82)	(0.12)	(0.34)	(-4.25)	(0.26)	(0.27)	(-5.07)	(0.54)	(-0.48)	(-3.73)	(0.30)
$LN(TA_{i,t})$	-0.056**	-0.088***	0.171**	-0.050*	-0.111***	0.221***	-0.041	-0.111***	0.209***	-0.054**	-0.087***	0.142*
	(-2.16)	(-2.65)	(2.36)	(-1.75)	(-4.42)	(2.89)	(-1.40)	(-4.63)	(3.22)	(-2.02)	(-3.04)	(1.93)
$BANKRATE_{i,t}$				0.088	0.067	0.025	0.080	0.066	0.016			
				(0.83)	(1.23)	(1.46)	(0.73)	(1.20)	(1.31)			
$FGDPg_{i,t}$							-23.653***	-0.920	-5.779			
							(-2.58)	(-0.11)	(-0.55)			
$FINF_{i,t}$							10.122***	0.042	-4.616			
							(2.91)	(0.42)	(-0.44)			
Country FE	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Obs.	640,627	1,412,890	614,178	594,890	1,309,173	560,166	592,809	1,307,415	560,137	638,531	1,407,529	607,352

Table OA-1 (continued)

Panel C: Predictive Power

		Parents (N=527,063)			*Subsidiaries (N=1,165,149)*			*Standalones (N=499,171)*		
Model	Decile	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
BCM (2012) Model	0	29.80	16.47	9.51	23.12	15.01	9.52	28.06	25.77	9.66
	1	17.12	16.20	9.64	15.35	13.80	9.70	14.03	16.26	9.88
	2	12.61	13.71	9.80	10.93	11.58	9.89	11.48	13.35	9.94
	Total	59.53	46.38	28.95	49.40	40.39	29.11	53.57	55.38	29.48
	AUC	0.7055			0.6485			0.6309		
Country/Industry/Time varying baseline	0	30.36	17.02	9.48	23.44	16.03	9.45	27.66	27.44	9.64
	1	17.45	15.72	9.66	15.38	13.89	9.69	14.23	16.59	9.88
	2	11.84	13.55	9.82	11.25	12.66	9.82	11.08	12.03	9.96
	Total	59.65	46.29	28.96	50.07	42.58	28.96	52.97	56.06	29.47
	AUC	0.7330			0.7185			0.6487		
Macro Model	0	32.81	19.00	9.36	22.67	16.47	9.43	27.38	28.25	9.62
	1	17.49	17.07	9.60	14.65	14.30	9.68	14.47	17.32	9.86
	2	12.42	13.45	9.82	11.02	12.13	9.86	9.92	12.49	9.96
	Total	62.72	49.52	28.78	48.34	42.91	28.97	51.77	58.06	29.45
	AUC	0.7355			0.6998			0.6310		
Fixed Effects Model	0	31.93	18.48	9.39	22.38	14.92	9.53	27.54	23.46	9.70
	1	16.77	17.25	9.60	14.82	13.39	9.73	12.40	15.09	9.91
	2	12.50	14.29	9.78	12.00	11.62	9.87	9.96	11.44	9.98
	Total	61.19	50.03	28.77	49.20	39.92	29.14	49.90	49.99	29.58
	AUC	0.7193			0.6330			0.6054		

Panel D: Significance of AUC differences

	p-values		
	Parents	Subsidiaries	Standalones
BCM (2012) Model vs. Country/Industry/Time varying baseline	0.0000	0.0000	0.0000
Macro Model vs. Country/Industry/Time varying baseline	0.2871	0.0000	0.0000
Fixed Effects Model vs. Country/Industry/Time varying baseline	0.0000	0.0000	0.0000

Table OA-1 (continued)

Panel E: Predictive Power Public vs. Private

		Parents						Subsidiaries					
		Private			*Public*			*Private*			*Public*		
		(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Country/Industry/Time varying baseline Pooled estimation	0	29.31	16.27	9.47	32.23	18.25	9.50	23.46	15.98	9.45	26.63	17.08	9.48
	1	16.1	14.99	9.68	18.97	17.94	9.61	15.51	13.52	9.71	15.00	15.37	9.68
	2	12.36	12.89	9.83	11.31	14.56	9.81	11.12	12.47	9.83	11.50	12.88	9.84
	Total	57.77	44.15	28.98	62.51	50.75	28.92	50.09	41.97	28.99	53.13	45.33	29.00
	AUC	0.7193			0.7496			0.7142			0.7511		
Country/Industry/Time varying baseline Public vs. Private partition-specific coefficients	0	30.46	16.21	9.46	33.40	21.54	9.36	23.09	15.43	9.49	27.52	18.33	9.40
	1	15.86	14.89	9.69	17.48	16.19	9.70	15.33	13.66	9.70	14.05	14.47	9.74
	2	11.55	12.55	9.85	12.35	14.75	9.79	11.12	12.03	9.86	11.34	12.2	9.88
	Total	57.87	43.65	29.00	63.23	52.48	28.85	49.54	41.12	29.05	52.91	45.00	29.02
	AUC	0.7188			0.7541			0.7126			0.7460		

Panel A presents descriptive statistics for the variables included in the default prediction models estimated using the *Estimation Sample* (see Table OA-2, Panel A). Panel B reports coefficients and (in parentheses) *z*-statistics from the estimation of four different discrete hazard models. The dependent variable is equal to one if firm i (parent, subsidiary, or standalone) files for bankruptcy in year $t + 1$, and zero otherwise. Heteroskedasticity-robust standard errors are clustered at the country and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Panel C presents a comparison between the predictive ability of the four models estimated out-of-sample. Column (1) reports the percentage of bankrupt firm-years that fall in each of the top three deciles of the predicted bankruptcy probability, Column (2) reports the percentage of years before bankruptcy, and Column (3) reports the percentage of non-bankrupt years. The Area Under the Receiver Operating Curve (AUC) is also reported. Panel D reports the p-values for the comparison of the AUC of the different models. Panel E compares the predictive ability of the Country/Industry/Time varying baseline model for public and private firms. We first estimate a single set of coefficients based on the pooled *Estimation Sample* and then estimate separate sets of coefficients for private and public firms. All variables are defined in the paper Appendix. The subscript i refers to parent, subsidiary, or standalone firms.

Table OA-2: Sample Selection and Descriptive Statistics

Panel A: Sample Selection Criteria

Estimation Sample

This sample comprises parents (ultimate owners), subsidiaries (levels 1 to 5) and standalone firms with total assets and sales greater than U.S. $10,000, excluding *Other legal form* entities, *Museums and educational services, Private households, Membership organizations* (SIC codes 8000-8999) and *Public services* (SIC code 9000-9999). This sample includes three types of observations: non-bankrupt firms, years before bankruptcy for bankrupt firms and bankruptcy year.

	Unique Obs.	*Firm-Year Obs.*
- Parents	105,999	640,627
- Subsidiaries	237,319	1,412,890
- Standalones	117,764	614,178

Base Model Sample

This sample limits the *Estimation Sample* to the subset of business group firms (parents and subsidiaries) for which ownership information to compute control rights is available. In the *Base Model Sample* of subsidiary firm-years, only the parent with the highest percentage of control in each subsidiary is retained.

	Firm-Year Obs.
- Parents	350,452
- Subsidiaries	928,162

Placebo Test Sample

This sample limits the *Base-Model Sample* to the subset of parents and subsidiaries for which a successful match with pseudo-parents and pseudo-subsidiaries obtains. Pseudo-parents and pseudo-subsidiaries are, respectively, median-sized standalone firms from the same country-industry of parents and subsidiaries.

	Firm-Year Obs.
- Parents (and matched pseudo-parents)	255,102
- Subsidiaries (and matched pseudo-subsidiaries)	510,581
- All standalones used in the placebo tests	544,704

Combined Model Sample

This sample limits the *Base Model Sample* to the subset of publicly-listed parents and subsidiaries with available data to compute market variables.

	Firm-Year Obs.
- Parents	31,051
- Subsidiaries	23,422

CDS Sample

This sample limits the *Base Model Sample* to the subset of parents and subsidiaries with available 5-year CDS contract data.

	Firm-Year Obs.
- Parents	3,377
- Subsidiaries	1,198

Table OA-2 (continued)

Panel B: Sample Composition by Country

Country	Parents		Subsidiaries		Standalones	
	Obs.	%	Obs.	%	Obs.	%
Algeria	0	0.00	21	0.00	0	0.00
Argentina	58	0.02	505	0.05	0	0.00
Australia	787	0.22	977	0.11	255	0.05
Austria	384	0.11	2,138	0.23	578	0.11
Bahamas	8	0.00	0	0.00	0	0.00
Bahrain	11	0.00	17	0.00	0	0.00
Bangladesh	3	0.00	10	0.00	0	0.00
Barbados	5	0.00	16	0.00	0	0.00
Belgium	7,835	2.24	27,911	3.01	1,245	0.23
Bermuda	151	0.04	189	0.02	0	0.00
Bolivia	0	0.00	7	0.00	0	0.00
Bosnia and Herzegovina	251	0.07	1,113	0.12	9,414	1.73
Botswana	6	0.00	13	0.00	0	0.00
Brazil	375	0.11	1,462	0.16	37	0.01
Bulgaria	1,259	0.36	3,654	0.39	2,883	0.53
Burkina Faso	0	0.00	1	0.00	0	0.00
Canada	785	0.22	934	0.10	1,046	0.19
Cayman Islands	69	0.02	178	0.02	7	0.00
Chile	67	0.02	156	0.02	0	0.00
China	1,366	0.39	2,503	0.27	2,183	0.40
Colombia	902	0.26	2,217	0.24	5,393	0.99
Costa Rica	0	0.00	6	0.00	0	0.00
Côte d'Ivoire	3	0.00	24	0.00	0	0.00
Croatia	1,346	0.38	3,656	0.39	618	0.11
Curaçao	12	0.00	6	0.00	0	0.00
Cyprus	96	0.03	140	0.02	36	0.01
Czech Republic	5,454	1.56	14,368	1.55	10,930	2.01
Denmark	3,820	1.09	7,600	0.82	213	0.04
Dominica	0	0.00	5	0.00	0	0.00
Ecuador	10	0.00	17	0.00	8	0.00
Egypt	43	0.01	102	0.01	18	0.00
El Salvador	0	0.00	9	0.00	0	0.00
Estonia	1,228	0.35	5,020	0.54	2,237	0.41
Fiji	6	0.00	6	0.00	0	0.00
Finland	10,996	3.14	25,143	2.71	1,347	0.25
France	89,242	25.46	208,946	22.51	40,810	7.49
Gabon	0	0.00	7	0.00	0	0.00
Germany	3,558	1.02	17,313	1.87	5,106	0.94
Ghana	0	0.00	14	0.00	0	0.00
Gibraltar	10	0.00			0	0.00
Greece	1,305	0.37	4,552	0.49	3,165	0.58
Guatemala	2	0.00	5	0.00	0	0.00
Guyana	0	0.00	6	0.00	0	0.00
Hong Kong	53	0.02	82	0.01	0	0.00
Hungary	132	0.04	304	0.03	95	0.02
Iceland	585	0.17	1,130	0.12	1,422	0.26
India	1,999	0.57	7,242	0.78	3,983	0.73
Indonesia	52	0.01	183	0.02	0	0.00
Iran	0	0.00	1	0.00	0	0.00
Ireland	357	0.10	798	0.09	1,732	0.32

(continued)

Table OA-2 (continued)

(continued)

Country	Parents		Subsidiaries		Standalones	
	Obs.	%	Obs.	%	Obs.	%
Israel	259	0.07	241	0.03	36	0.01
Italy	21,580	6.16	78,920	8.50	130,649	23.99
Jamaica	18	0.01	17	0.00	0	0.00
Japan	11,980	3.42	47,637	5.13	1,029	0.19
Jordan	124	0.04	311	0.03	30	0.01
Kazakhstan	9	0.00	31	0.00	9	0.00
Kenya	9	0.00	39	0.00	0	0.00
Korea	1,798	0.51	5,885	0.63	19,238	3.53
Kuwait	142	0.04	242	0.03	10	0.00
Latvia	355	0.10	737	0.08	477	0.09
Liberia	4	0.00	7	0.00	0	0.00
Lithuania	240	0.07	1,282	0.14	598	0.11
Luxembourg	607	0.17	1,574	0.17	222	0.04
Macedonia	12	0.00	17	0.00	0	0.00
Malaysia	302	0.09	425	0.05	3,966	0.73
Malta	151	0.04	397	0.04	20	0.00
Marshall Islands	12	0.00	3	0.00	0	0.00
Mauritius	22	0.01	28	0.00	2	0.00
Mexico	220	0.06	923	0.10	0	0.00
Moldova	26	0.01	50	0.01	23	0.00
Monaco	0	0.00	6	0.00	0	0.00
Montenegro	7	0.00	34	0.00	0	0.00
Morocco	1	0.00	32	0.00	3	0.00
Namibia	0	0.00	2	0.00	0	0.00
Nepal	0	0.00	8	0.00	0	0.00
Netherlands	6,626	1.89	12,414	1.34	238	0.04
New Zealand	20	0.01	362	0.04	7	0.00
Nigeria	12	0.00	88	0.01	0	0.00
Norway	5,457	1.56	29,760	3.21	16,903	3.10
Oman	42	0.01	84	0.01	0	0.00
Pakistan	66	0.02	172	0.02	152	0.03
Palestine	12	0.00	60	0.01	0	0.00
Panama	5	0.00	6	0.00	0	0.00
Paraguay	0	0.00	4	0.00	0	0.00
Peru	21	0.01	71	0.01	0	0.00
Philippines	19	0.01	102	0.01	0	0.00
Poland	3,526	1.01	15,784	1.70	6,991	1.28
Portugal	10,131	2.89	30,152	3.25	43,787	8.04
Qatar	6	0.00	13	0.00	0	0.00
Romania	1,101	0.31	6,341	0.68	9,797	1.80
Russia	12,300	3.51	30,456	3.28	96,136	17.65
Saudi Arabia	68	0.02	72	0.01	1	0.00
Serbia	471	0.13	3,018	0.33	2,323	0.43
Singapore	202	0.06	287	0.03	7	0.00
Slovakia	827	0.24	2,911	0.31	2,295	0.42
Slovenia	603	0.17	2,680	0.29	2,418	0.44
South Africa	139	0.04	122	0.01	0	0.00
Spain	48,606	13.87	124,552	13.42	61,073	11.21
Sri Lanka	90	0.03	261	0.03	0	0.00
Sweden	57,859	16.51	112,223	12.09	1,415	0.26

(continued)

Table OA-2 (continued)

(continued)

Country	Parents		Subsidiaries		Standalones	
	Obs.	%	Obs.	%	Obs.	%
Switzerland	634	0.18	527	0.06	74	0.01
Taiwan	2,338	0.67	3,379	0.36	151	0.03
Tanzania	0	0.00	7	0.00	0	0.00
Thailand	144	0.04	359	0.04	2,130	0.39
Trinidad and Tobago	4	0.00	12	0.00	0	0.00
Tunisia	0	0.00	14	0.00	0	0.00
Turkey	196	0.06	700	0.08	237	0.04
Ukraine	8,483	2.42	15,146	1.63	8,358	1.53
United Arab Emirates	19	0.01	10	0.00	0	0.00
United Kingdom	13,081	3.73	55,422	5.97	38,279	7.03
United States	4,748	1.35	865	0.09	795	0.15
Uruguay	0	0.00	2	0.00	0	0.00
Venezuela	11	0.00	19	0.00	0	0.00
Vietnam	53	0.02	114	0.01	64	0.01
Virgin Islands	23	0.01	24	0.00	0	0.00
Zambia	0	0.00	7	0.00	0	0.00
Zimbabwe	0	0.00	5	0.00	0	0.00
Total	350,452	100.00	928,162	100.00	544,704	100.00

Panel C: Firm-Year Observations by Year

Year	Parents		Subsidiaries		Standalones	
	Obs.	%	Obs.	%	Obs.	%
2006	34,369	9.81	88,812	9.57	59,739	10.97
2007	39,941	11.40	104,156	11.22	69,859	12.82
2008	45,176	12.89	118,558	12.77	74,771	13.73
2009	50,265	14.34	133,848	14.42	82,105	15.07
2010	57,040	16.28	151,614	16.33	84,731	15.56
2011	60,467	17.25	161,420	17.39	85,213	15.64
2012	63,194	18.03	169,754	18.29	88,293	16.21
Total	350,452	100.00	928,162	100.00	544,711	100.00

Panel D: Firm-Year Observations by Industry

One-Digit SIC Code	Parents		Subsidiaries		Standalones	
	Obs.	%	Obs.	%	Obs.	%
0: Agriculture, forestry and fishery	6,897	1.97	18,679	2.01	21,382	3.93
1: Mining and construction	32,315	9.22	113,172	12.19	78,551	14.42
2: Light manufactured products	22,745	6.49	81,063	8.73	48,151	8.84
3: Heavy manufactured products	31,453	8.97	115,724	12.47	60,257	11.06
4: Transportation, communications, electric, gas and sanitary services	18,779	5.36	91,950	9.91	32,346	5.94
5: Wholesale and retail trade	55,107	15.72	224,341	24.17	140,756	25.84
6: Finance, insurance and real estate	144,378	41.20	151,693	16.34	94,742	17.39
7: Services	38,778	11.07	131,540	14.17	68,526	12.58
Total	350,452	100.00	928,162	100.00	544,711	100.00

Table OA-2 (continued)

Panel E: Descriptive Statistics for Variables Used in the Main Models

	Obs.	Mean	Std. Dev.	P25	Median	P75
Parent-level variables:						
$Y_{p,t+1}$	350,452	0.0085	0.0920	0.0000	0.0000	0.0000
$NROAI_{p,t}$	350,452	0.2359	0.4245	0.0000	0.0000	0.0000
$ROA_{p,t}$	350,452	0.0569	0.1452	0.0000	0.0281	0.0925
$LTA_{p,t}$	350,452	0.5272	0.3076	0.2783	0.5382	0.7610
$ETL_{p,t}$	350,452	0.0962	0.4863	-0.0096	0.0493	0.1685
$LN(TA_{p,t})$	350,452	8.6888	2.3676	7.0139	8.3974	10.0180
$BANKRATE_{p,t}$	350,452	0.6208	0.9153	0.1831	0.5005	0.8163
$\overline{Pr(Y_{s,t+1})}$	310,181	0.0051	0.0034	0.0028	0.0045	0.0064
$\bar{Y}_{s,t}$	302,462	0.0162	0.1262	0.0000	0.0000	0.0000
$D2D_{p,t}$	29,342	3.9704	2.4709	2.1811	3.5769	5.2768
$VOL_{p,t}$	31,773	0.4397	0.2248	0.2902	0.3910	0.5344
$RSIZE_{p,t}$	31,365	-8.7569	2.2121	-10.3367	-8.9025	-7.2893
$RET_{p,t}$	31,774	-0.1450	0.4046	-0.3927	-0.1594	0.0560
$\overline{Pr(Y_{stdln,t+1})}$	287,274	0.0030	0.0019	0.0016	0.0029	0.0041
$\bar{Y}_{stdln,t}$	278,919	0.0109	0.1038	0.0000	0.0000	0.0000
Subsidiary-level variables:						
$Y_{s,t+1}$	928,162	0.0115	0.1066	0.0000	0.0000	0.0000
$NROAI_{s,t}$	928,162	0.2807	0.4494	0.0000	0.0000	1.0000
$ROA_{s,t}$	928,162	0.0323	0.1698	-0.0091	0.0216	0.0841
$LTA_{s,t}$	928,162	0.6827	0.3868	0.4414	0.6888	0.8841
$ETL_{s,t}$	928,162	0.1271	0.4588	-0.0083	0.0559	0.1972
$LN(TA_{s,t})$	928,162	8.2471	2.1952	6.7499	8.1411	9.6525
$BANKRATE_{s,t}$	928,162	0.6433	1.0310	0.1791	0.4648	0.8597
$Pr(Y_{p,t+1})$	823,764	0.0030	0.0026	0.0013	0.0024	0.0039
$\overline{Pr(Y_{others,t+1})}$	650,943	0.0046	0.0027	0.0025	0.0044	0.0060
$Y_{p,t}$	855,821	0.0039	0.0622	0.0000	0.0000	0.0000
$\overline{Y_{others,t}}$	660,058	0.0059	0.0448	0.0000	0.0000	0.0000
$D2D_{p,t}$	23,422	3.6421	2.3208	1.9693	3.2660	4.8975
$VOL_{p,t}$	25,773	0.4887	0.2800	0.3096	0.4240	0.5827
$RSIZE_{p,t}$	15,653	-7.7777	2.4532	-9.6165	-7.9934	-6.1811
$RET_{p,t}$	25,754	-0.1138	0.4407	-0.3908	-0.1597	0.0776
$Pr(Y_{stdln,t+1})$	673,764	0.0032	0.0020	0.0018	0.0030	0.0042
$\bar{Y}_{stdln,t}$	694,606	0.0063	0.0790	0.0000	0.0000	0.0000

This table presents sample selection criteria, sample composition and descriptive statistics for the sample of parent, subsidiary and standalone firm-year observations. Panel A presents the sample selection criteria. We build five different samples: (1) the *Estimation Sample* of parent, subsidiary and standalone firm-year observations; (2) the *Base Model Sample*; (3) the *Placebo Test Sample*; (4) the *Combined Model Sample*; and (5) the *CDS Sample*. Panels B, C and D respectively present the distribution of observations by country, year and industry for the *Base Model Sample* containing the subset of observations from the *Estimation Sample* (Table OA-1) for which ownership information to compute control rights is available. Panel E presents descriptive statistics for the variables used in the main default prediction models. All variables are defined in the paper Appendix. The subscripts *p*, *s*, and *stdln* are used to identify parent-, subsidiary-, and standalone-level variables, respectively.

Table OA-3: Placebo Test - Parent Model

		Dependent variable: $Y_{p,t+1}$	
Independent variables:		(1)	(2)
Intercept		-5.642***	-5.647***
		(-12.74)	(-12.74)
$NROAI_{p,t}$	(+)	0.288***	0.288***
		(2.78)	(2.78)
$ROA_{p,t}$	(–)	-2.563***	-2.564***
		(-8.99)	(-9.03)
$LTA_{p,t}$	(+)	1.690***	1.689***
		(9.12)	(9.12)
$ETL_{p,t}$	(–)	-0.193	-0.193
		(-1.41)	(-1.41)
$LN(TA_{p,t})$	(–)	-0.067**	-0.067**
		(-2.04)	(-2.04)
$BANKRATE_{p,t}$	(+)	0.154*	0.156*
		(1.79)	(1.83)
$\overline{Pr(Y_{stdln,t+1})}$	(NS)	104.566	104.734
		(1.48)	(1.49)
$\bar{Y}_{stdln,t}$	(NS)		-0.214
			(-0.55)
Comp. Model		Model (1) without $\overline{Pr(Y_{stdln,t+1})}$	Model (1) without $\overline{Pr(Y_{stdln,t+1})}$ and $\bar{Y}_{stdln,t}$
AUC		0.7404	0.7404
AUC (Comp. Model)		0.7511	0.7511
p-value (vs. Comp. Model)		0.0000	0.0000
% Top Three Deciles		64.17	63.91
% Top Three Deciles (Comp. Model)		64.64	64.64
Obs.		255,102	255,102

This table reports the results of a placebo test in which each subsidiary is replaced by the median-sized standalone firm in the same country-industry. The sample is limited to observations for which a successful match with standalone firms from the same country-industry obtains (*Placebo Test Sample*). All variables are defined in the paper Appendix. Heteroskedasticity-robust standard errors are clustered at the parent-country and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. The subscripts p and $stdln$ are used to identify parent- and standalone-level variables, respectively.

Table OA-4: Augmented Parent Combined Model

Panel A: Parent Hazard Model

		Dependent variable: $Y_{p,t+1}$			
Independent variables:		(1)	(2)	(3)	(4)
Intercept		-4.519***	-5.889***	-8.282***	-9.652***
		(-4.80)	(-4.77)	(-4.22)	(-4.59)
$NROAI_{p,t}$	(+)	-0.535	-0.559	-0.403	-0.372
		(-1.15)	(-1.17)	(-0.65)	(-0.59)
$ROA_{p,t}$	(–)	-9.213***	-8.513***	-8.461***	-6.972***
		(-4.90)	(-4.57)	(-4.70)	(-3.60)
$LTA_{p,t}$	(+)	1.160*	1.215*	2.006***	2.069***
		(1.70)	(1.96)	(4.51)	(4.71)
$ETL_{p,t}$	(–)	0.871**	1.076**	0.902**	0.907**
		(2.12)	(2.02)	(2.39)	(2.13)
$LN(TA_{p,t})$	(–)	-0.075	-0.010	-0.002	0.068
		(-0.77)	(-0.09)	(-0.01)	(0.49)
$BANKRATE_{p,t}$		0.083***	0.090***	0.100**	0.139***
		(3.20)	(4.49)	(2.42)	(3.06)
$D2D_{p,t}$	(–)	-0.474***	-0.451***		
		(-2.99)	(-3.06)		
$VOL_{p,t}$				1.556***	1.519***
				(3.59)	(4.19)
$RSIZE_{p,t}$				0.006	-0.001
				(0.08)	(-0.01)
$RET_{p,t}$	(+)			-0.852*	-0.954*
				(-1.73)	(-1.75)
$\overline{Pr(Y_{s,t+1})}$	(+)		106.950***		96.918***
			(5.23)		(3.98)
Marginal effects:					
$\overline{Pr(Y_{s,t+1})}$			0.108		0.1386
Obs.		29,342	26,047	31,051	27,488

Table OA-4 (continued)

Panel B: Predictive Ability

Model	Decile	(1)	(2)	(3)
Model (1)	0	70.15	39.59	9.47
	1	5.97	16.38	9.93
	2	2.99	8.19	10.04
	Total	79.10	64.16	29.45
	AUC	0.8377		
Model (2)	0	70.15	37.20	9.50
	1	7.46	15.70	9.94
	2	4.48	11.26	10.00
	Total	82.09	64.16	29.44
	AUC	0.8552		
p-value (vs. Model (1))		0.0783		
Model (3)	0	63.77	39.63	9.47
	1	11.59	12.38	9.97
	2	7.25	9.91	10.01
	Total	82.61	61.92	29.45
	AUC	0.8483		
Model (4)	0	75.36	36.84	9.48
	1	2.90	11.15	10.01
	2	5.80	9.60	10.02
	Total	84.06	57.59	29.50
	AUC	0.8761		
p-value (vs. Model (3))		0.0215		

This table presents the results of the parent default prediction analysis for the *Combined Model Sample* (see Table OA-2, Panel A) of publicly listed parent firms using a model that combines accounting and market data. The number of observations decreases with respect to the specification presented in Table 1, Panel A in the paper, due to data availability requirements on distance to default and remaining market variables. Panel A reports coefficients and (in parentheses) *z*-statistics from the estimation of a discrete hazard model. The dependent variable is equal to one if the parent files for bankruptcy in year $t+1$, and zero otherwise. The specification presented in Column (1) includes parent-level financial ratios and parent-level distance to default only: $Pr(Y_{p,t+1}=1) = f(NROAI_{p,t}, ROA_{p,t}, LTA_{p,t}, ETL_{p,t}, LN(TA_{p,t}), D2D_{p,t}, BANKRATE_{p,t})$. Column (2) adds the average estimated bankruptcy probability of all group subsidiaries ($\overline{\Pr(Y_{s,t+1})}$). In Column (3) the distance to default measure ($D2D_{p,t}$) is replaced by the volatility of the parent's returns ($VOL_{p,t}$), the parent's market capitalization relative to its country total market capitalization ($RSIZE_{p,t}$), and the parent's returns over the previous year ($RET_{p,t}$). Column (4) adds the average estimated bankruptcy probability of all group subsidiaries ($\overline{Pr(Y_{s,t+1})}$) to the specification presented in Column (3). Marginal effects for group-level variables are reported as the change in estimated bankruptcy probability as each of the group-level variables increases by one standard deviation, scaled by the average estimated bankruptcy probability. Heteroskedasticity-robust standard errors are clustered at the parent-country and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Panel B presents a comparison between the predictive power of the augmented models and that of the base models reported in Columns (1) and (3) using constant samples. Columns (1), (2) and (3) present the percentage of bankrupt years, years before bankruptcy and non-bankrupt firm-years falling in each of the top three deciles. The Area Under the Receiver Operating Characteristic Curve (AUC) is also reported for each subgroup. All variables are defined in the paper Appendix. The subscripts p and s are used to identify parent- and subsidiary-level variables, respectively.

Table OA-5: Augmented Parent Model by Capital Market Development, Rule of Law and Financial Reporting Transparency

Panel A: Augmented Parent Model by Parent-Country Capital Market Development and Financial Reporting Transparency

	Parent-Country Capital Market Development			
	Weak		*Strong*	
	Financial Reporting Transparency		Financial Reporting Transparency	
	Low	*High*	*Low*	*High*
	(1)	(2)	(3)	(4)
Model	$Pr(Y_{p,t+1}=1) = f\left(NROAI_{p,t}, ROA_{p,t}, LTA_{p,t}, ETL_{p,t}, LN(TA_{p,t}), BANKRATE_{p,t}, \overline{Pr(Y_{s,t+1})}\right)$			
Comp. Model	Model (1) without $\overline{Pr(Y_{s,t+1})}$	Model (2) without $\overline{Pr(Y_{s,t+1})}$	Model (3) without $\overline{Pr(Y_{s,t+1})}$	Model (4) without $\overline{Pr(Y_{s,t+1})}$
AUC	0.7337	0.7856	0.6741	0.8373
AUC (Comp. Model)	0.7158	0.7821	0.6631	0.8407
p-value (vs. Comp. Model)	0.0000	0.1469	0.0109	0.1069
% Top Three Deciles	66.43	80.00	52.00	81.88
% Top Three Deciles (Comp. Model)	61.54	78.57	52.00	79.55

Panel B: Augmented Parent Model by Parent-Country Rule of Law and Financial Reporting Transparency

	Parent-Country Rule of Law			
	Weak		*Strong*	
	Financial Reporting Transparency		Financial Reporting Transparency	
	Low	*High*	*Low*	*High*
	(1)	(2)	(3)	(4)
Model	$Pr(Y_{p,t+1}=1) = f\left(NROAI_{p,t}, ROA_{p,t}, LTA_{p,t}, ETL_{p,t}, LN(TA_{p,t}), BANKRATE_{p,t}, \overline{Pr(Y_{s,t+1})}\right)$			
Comp. Model	Model (5) without $\overline{Pr(Y_{s,t+1})}$	Model (6) without $\overline{Pr(Y_{s,t+1})}$	Model (7) without $\overline{Pr(Y_{s,t+1})}$	Model (8) without $\overline{Pr(Y_{s,t+1})}$
AUC	0.6422	0.7818	0.7392	0.8126
AUC (Comp. Model)	0.6206	0.7809	0.7319	0.8132
p-value (vs. Comp. Model)	0.0159	0.6929	0.0000	0.1586
% Top Three Deciles	80.00	66.43	81.88	52.00
% Top Three Deciles (Comp. Model)	78.57	61.54	79.55	52.00

This table presents the results of an additional analysis based on the tests shown in Table 2 of the paper. Specifically, Panels A and B present sample partitions based on capital market development (computed as ratio of total market capitalization of all firms in a country to the country's GDP. Source: World Bank) and rule of law (Kaufmann et al., 2009), respectively. In this analysis, the *Base Model Sample* (see Table OA-2, Panel A) is limited to parents for which consolidated financial statements are available and to subsidiaries that are consolidated, i.e., in which the parent's control rights are equal to, or higher than, 50%. We classify a country as having high (low) financial reporting transparency if it falls in the Leuz (2010) institutional clusters 1 or 2 (3, 4, or 5). A parent country is classified as having strong (weak) capital market development and rule of law if the country's capital market development and rule of law indices are above (below) the respective sample medians. The dependent variable is equal to one if the parent files for bankruptcy in year $t+1$, and zero otherwise. The Area Under the Receiver Operating Characteristic Curve (AUC) and the percentage of bankrupt years in the top three deciles are reported for each sample partition, as is the p-value for the increase in the AUC in the augmented model. Heteroskedasticity-robust standard errors are clustered at the parent-country and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in the paper Appendix. The subscripts p and s are used to identify parent- and subsidiary-level variables, respectively.

Table OA-6: Placebo Test - Subsidiary Model

		Dependent variable: $Y_{s,t+1}$			
Independent variables:		(2)	(3)	(4)	(5)
Intercept		-4.124***	-5.039***	-4.129***	-5.040***
		(-6.78)	(-8.75)	(-6.93)	(-8.85)
$NROAI_{s,t}$	(+)	0.322***	0.256***	0.318***	0.254***
		(6.93)	(4.32)	(6.72)	(4.23)
$ROA_{s,t}$	(–)	-0.785***	-0.716***	-0.807***	-0.733***
		(-4.52)	(-3.74)	(-5.23)	(-4.10)
$LTA_{s,t}$	(+)	0.440***	0.320***	0.448***	0.323***
		(4.63)	(3.15)	(4.95)	(3.37)
$ETL_{s,t}$	(–)	-0.206***	-0.172***	-0.197***	-0.162***
		(-5.13)	(-4.25)	(-4.70)	(-3.80)
$LN(TA_{s,t})$	(–)	-0.133***	-0.087**	-0.132***	-0.088**
		(-3.38)	(-2.30)	(-3.47)	(-2.37)
$BANKRATE_{s,t}$	(+)	0.126**	0.120**	0.116*	0.109*
		(1.98)	(2.05)	(1.76)	(1.82)
$Pr(Y_{stdln,t+1})$	(NS)	80.708	25.969	79.915	26.686
		(1.48)	(0.73)	(1.49)	(0.78)
$\overline{Pr(Y_{others,t+1})}$	(+)		151.786***		152.722***
			(7.18)		(7.02)
$\overline{Y_{others,t}}$	(+)			1.686***	2.408***
				(15.45)	(8.94)
Comp. Model		Model (2) without $Pr(Y_{stdln,t+1})$	Model (3) without $Pr(Y_{stdln,t+1})$	Model (4) without $Pr(Y_{stdln,t+1})$	Model (5) without $Pr(Y_{stdln,t+1})$
AUC		0.6989	0.7064	0.7007	0.7082
AUC (Comp. Model)		0.7152	0.7162	0.7170	0.7181
p-value (vs. Comp. Model)		0.0000	0.0000	0.0000	0.0000
% Top Three Deciles		50.55	51.96	50.88	52.13
% Top Three Deciles (Comp. Model)		51.15	52.99	51.75	53.07
Obs.		510,581	510,581	484,321	481,807

This table reports the results of a placebo test in which each parent is replaced by the median-sized standalone firm in the same country-industry. The sample is limited to observations for which a successful match with standalone firms from the same country-industry obtains (*Placebo Test Sample*). All variables are defined in the paper Appendix. Heteroskedasticity-robust standard errors are clustered at the subsidiary-country and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. The subscripts s and $stdln$ are used to identify subsidiary- and standalone-level variables, respectively.

Table OA-7: Augmented Subsidiary Combined Model

Panel A: Subsidiary Hazard Model

		Dependent variable: $Y_{s,t+1}$					
Independent variables:		(1)	(2)	(3)	(4)	(5)	(6)
Intercept		-6.345***	-8.446***	-8.692***	-7.125	-7.877	-10.100**
		(-6.59)	(-9.08)	(-9.80)	(-1.64)	(-1.53)	(-2.12)
$NROAI_{s,t}$	(+)	0.022	-0.056	-0.085	-0.065	-0.206	-0.196
		(0.18)	(-0.37)	(-0.40)	(-0.23)	(-0.75)	(-0.66)
$ROA_{s,t}$	(–)	-3.923***	-3.947***	-3.518***	-3.545***	-3.567***	-3.285***
		(-5.15)	(-5.71)	(-4.20)	(-5.74)	(-4.45)	(-3.52)
$LTA_{s,t}$	(+)	0.480	0.543*	0.775**	0.653**	0.538*	0.749
		(1.53)	(1.79)	(2.14)	(2.40)	(1.88)	(1.51)
$ETL_{s,t}$	(–)	0.091	0.053	0.040	0.155	0.115	0.268
		(0.21)	(0.10)	(0.06)	(0.71)	(0.43)	(0.88)
$LN(TA_{s,t})$	(–)	0.118	0.221***	0.220***	0.060	0.098	0.175
		(1.54)	(2.71)	(2.88)	(0.22)	(0.31)	(0.62)
$BANKRATE_{s,t}$	(+)	0.036**	0.078***	0.068***	0.047	0.077	0.086*
		(2.27)	(3.27)	(2.90)	(1.37)	(1.33)	(1.66)
$D2D_{s,t}$		-0.412***	-0.320***	-0.333***			
		(-4.02)	(-3.28)	(-2.60)			
$VOL_{s,t}$					0.613	0.272	-0.220
					(1.26)	(0.41)	(-0.24)
$RSIZE_{s,t}$					0.025	0.019	-0.089
					(0.17)	(0.12)	(-0.73)
$RET_{s,t}$					-0.556**	-0.551*	-0.565*
					(-2.20)	(-1.96)	(-1.95)
$Pr(Y_{p,t+1})$	(+)		234.288***	155.592***		220.323***	119.168**
			(45.05)	(8.41)		(5.71)	(2.55)
$\overline{Pr(Y_{others,t+1})}$	(+)			97.710**			183.728***
				(2.20)			(2.97)
Marginal Effects:							
$Pr(Y_{p,t+1})$			0.209	0.138		0.290	0.143
$\overline{Pr(Y_{others,t+1})}$				0.107			0.282
Obs.		23,422	20,815	18,250	15,429	13,059	11,101

Table OA-7 (continued)

Panel B: Predictive Ability

Model	Decile	(1)	(2)	(3)
Model (1)	0	43.84	33.92	9.45
	1	16.44	16.25	9.88
	2	4.11	9.19	10.04
	Total	64.38	59.36	29.37
	AUC	0.7523		
Model (2)	0	41.10	40.28	9.35
	1	15.07	11.66	9.96
	2	12.33	9.19	10.01
	Total	68.49	61.13	29.32
	AUC	0.7894		
	p-value (vs. Model (1))	0.0110		
Model (3)	0	41.10	38.87	9.38
	1	15.07	13.07	9.93
	2	12.33	8.13	10.03
	Total	68.49	60.07	29.34
	AUC	0.7965		
	p-value (vs. Model (1))	0.0016		
Model (4)	0	35.90	28.71	9.71
	1	10.26	11.88	9.98
	2	5.13	7.92	10.05
	Total	51.28	48.51	29.73
	AUC	0.6609		
Model (5)	0	30.77	27.72	9.74
	1	5.13	14.85	9.97
	2	23.08	9.90	9.97
	Total	58.97	52.48	29.67
	AUC	0.7606		
	p-value (vs. Model (4))	0.0060		
Model (6)	0	33.33	30.69	9.70
	1	15.38	15.84	9.92
	2	2.56	6.93	10.07
	Total	51.28	53.47	29.69
	AUC	0.7859		
	p-value (vs. Model (4))	0.0012		

This table presents the results of the subsidiary default prediction analysis for the *Combined Model Sample* (see Table OA-2, Panel A) of publicly listed subsidiary firms using a model that combines accounting and market data. The number of observations decreases with respect to the specification presented in Table 5, Panel A, due to data availability requirements on distance to default and remaining market variables. Panel A reports coefficients and (in parentheses) *z*-statistics from the estimation of a discrete hazard model. The dependent variable is equal to one if the subsidiary files for bankruptcy in year $t+1$, and zero otherwise. The specification presented in Column (1) includes subsidiary-level financial ratios and distance to default only: $Pr(Y_{s,t+1}=1) = f(NROAI_{s,t}, ROA_{s,t}, LTA_{s,t}, ETL_{s,t}, LN(TA_{s,t}), BANKRATE_{s,t}, D2D_{s,t})$, Column (2) adds the parent estimated bankruptcy probability ($\Pr(Y_{p,t+1}=1)$) and Column (3) the average estimated bankruptcy probability of other subsidiaries in the group ($\overline{(Pr(Y_{others,t+1})}$). In Column (4) the distance to default measure ($D2D_{s,t}$) is replaced by the volatility of the subsidiary's returns ($VOL_{s,t}$), the subsidiary's market capitalization relative to its country's total market capitalization ($RSIZE_{s,t}$), and the subsidiary's returns over the previous year ($RET_{s,t}$). Columns (5) and (6) add the parent estimated bankruptcy probability ($Pr(Y_{p,t+1}=1)$) and the average bankruptcy probability of other subsidiaries in the group ($\overline{Pr(Y_{others,t+1})}$) to the specification presented in Column (4). Marginal effects for group-level variables are reported as the change in estimated bankruptcy probability as each of the group-level variables increases by one standard deviation, scaled by the average estimated bankruptcy probability. Heteroskedasticity-robust standard errors are clustered at the parent-country and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Panel B presents a comparison between the predictive power of the augmented models and that of

the base models reported in Columns (1) and (4) using constant samples. Columns (1), (2) and (3) present the percentage of bankrupt years, years before bankruptcy and non-bankrupt firm-years falling in each of the top three deciles. The Area Under the Receiver Operating Characteristic Curve (AUC) is also reported for each subgroup. All variables are defined in the paper Appendix. The subscripts p, and s are used to identify parent- and subsidiary-level variables, respectively.

Table OA-8: Cross-Sectional Variation in CDS Spreads

Panel A: Parent CDS Spreads

		Dependent variable: $LN(CDS5Y_{p,t})$					
Independent variables:		(1)	(2)	(3)	(4)	(5)	(6)
Intercept		-3.584***	-4.095***	-3.473***	-3.954***	-5.381***	-5.686***
		(-4.81)	(-6.52)	(-4.36)	(-5.75)	(-5.30)	(-6.44)
$NROAI_{p,t}$	(+)	0.643***	0.666***	0.511**	0.539***	0.282	0.285
		(2.90)	(3.02)	(2.58)	(2.73)	(1.38)	(1.33)
$ROA_{p,t}$	(–)	-2.934	-2.706	-0.683	-0.487	1.078	0.910
		(-1.25)	(-0.93)	(-0.42)	(-0.23)	(0.58)	(0.45)
$LTA_{p,t}$	(+)	1.734***	1.764***	1.003***	1.047***	1.410***	1.410***
		(5.19)	(5.31)	(3.87)	(4.97)	(5.70)	(6.03)
$ETL_{p,t}$	(–)	0.225	0.454	1.383**	1.544**	-0.405	-0.259
		(0.23)	(0.46)	(2.32)	(2.06)	(-0.78)	(-0.45)
$LN(TA_{p,t})$	(–)	-0.140***	-0.149***	-0.064	-0.076*	-0.114***	-0.117***
		(-3.65)	(-4.01)	(-1.45)	(-1.79)	(-2.69)	(-2.94)
$BANKRATE_{p,t}$	(+)	0.115	0.050*	0.100	0.041*	0.694***	0.328***
		(1.48)	(1.94)	(1.54)	(1.73)	(2.83)	(2.68)
$D2D_{p,t}$	(–)			-0.248***	-0.238***		
				(-5.90)	(-4.85)		
$VOL_{p,t}$	(+)					4.024***	3.792***
						(8.28)	(15.43)
$RSIZE_{p,t}$	(–)					0.029	0.033
						(0.89)	(0.88)
$RET_{p,t}$	(–)					-0.545***	-0.625***
						(-3.88)	(-4.51)
$\overline{Pr(Y_{s,t+1})}$	(+)		185.957**		182.074***		165.862***
			(2.40)		(3.31)		(4.29)
Obs.		3,377	3,377	3,152	3,152	3,077	3,077
R^2		0.204	0.300	0.387	0.476	0.488	0.552
Shapley R^2 (%) for $\overline{Pr(Y_{s,t+1})}$			33.7725		21.4178		16.6921

Table OA-8 (continued)

Panel B: Subsidiary CDS Spreads

Independent variables:		*Dependent variable:* $LN(CDS5Y_{s,t})$								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept		-4.350***	-4.508***	-4.391***	-3.736***	-3.824***	-3.569***	-2.641**	-1.665	-1.965
		(-5.73)	(-6.72)	(-7.68)	(-4.91)	(-5.09)	(-5.83)	(-2.15)	(-1.05)	(-1.27)
$NROAI_{s,t}$	(+)	0.776***	0.848***	0.810***	0.766***	0.834***	0.838***	0.612*	0.587*	0.546*
		(2.84)	(2.98)	(3.08)	(3.04)	(3.22)	(3.48)	(1.83)	(1.77)	(1.92)
$ROA_{s,t}$	(–)	-0.709	0.998	1.129	1.525	3.385*	3.740**	1.236	2.933**	3.051***
		(-0.58)	(0.47)	(0.53)	(1.20)	(1.93)	(2.06)	(0.83)	(2.19)	(2.72)
$LTA_{s,t}$	(+)	1.873***	1.898***	2.045***	1.198***	1.197***	1.246***	1.534***	1.586***	1.635***
		(5.16)	(5.18)	(6.98)	(3.04)	(3.16)	(3.98)	(7.66)	(6.42)	(6.73)
$ETL_{s,t}$	(–)	0.378	0.324	0.002	1.693*	1.500	1.114	-0.157	-0.633	-0.873*
		(0.69)	(0.67)	(0.00)	(1.69)	(1.39)	(1.05)	(-0.48)	(-1.20)	(-1.83)
$LN(TA_{s,t})$	(–)	-0.102**	-0.125***	-0.161***	-0.063*	-0.088**	-0.133***	-0.258***	-0.324***	-0.326***
		(-2.48)	(-3.03)	(-4.10)	(-1.83)	(-2.56)	(-4.02)	(-2.97)	(-3.31)	(-3.54)
$BANKRATE_{s,t}$	(+)	0.079*	0.051***	0.013***	0.068*	0.044***	0.009	0.539	0.167	0.031
		(1.83)	(3.13)	(2.95)	(1.76)	(2.61)	(1.26)	(1.55)	(1.29)	(0.32)
$D2D_{s,t}$	(–)				-0.257***	-0.252***	-0.235***			
					(-4.46)	(-3.17)	(-2.84)			
$VOL_{s,t}$	(+)							5.111***	4.757***	4.490***
								(8.91)	(5.44)	(4.93)
$RSIZE_{s,t}$	(–)							0.181***	0.224***	0.206***
								(3.03)	(3.62)	(3.37)
$RET_{s,t}$	(–)							-0.448**	-0.544***	-0.632***
								(-2.29)	(-2.80)	(-3.34)
$Pr(Y_{p,t+1})$	(+)		252.338**	-36.130		243.852***	-30.633		253.852***	46.508
			(2.03)	(-0.36)		(2.70)	(-0.52)		(2.74)	(0.95)
$\overline{Pr(Y_{others,t+1})}$	(+)			298.672***			287.752***			237.526***
				(3.57)			(3.89)			(3.89)
Obs.		1,198	1,198	1,167	1,069	1,069	1,044	509	509	497
R^2		0.147	0.248	0.322	0.297	0.389	0.454	0.458	0.546	0.594
Shapley R^2 (%) for $Pr(Y_{p,t+1})$			41.0401	16.6173		24.2991	11.0303		18.4935	9.4582
Shapley R^2 (%) for $\overline{Pr(Y_{others,t+1})}$				35.7715			25.3073			19.0053
Total R^2contribution of group variables (%)				52.3888			36.3376			28.4635

This table reports the results of the analysis that examines the association between group-level variables and cross-sectional variation in parent and subsidiary credit default swap (CDS) spreads for the *CDS Sample* (see Table OA-2, Panel A) of parent and subsidiary firm-years. The number of observations decreases with respect to the specification

presented in Table 1, Panel A of the paper due to data availability requirements on 5-year CDS spreads (Columns (1) and (2)), distance to default (Columns (3) and (4)) and market variables (Columns (5) and (6)). Panel A reports OLS coefficient estimates and (in parentheses) *t*-statistics for the sample of parent firms 5-year CDS contracts, where the dependent variable is equal to the natural logarithm of the spread at the end of year t. Panel B presents a similar analysis for a sample of subsidiary firms 5-year CDS contracts. Panel A (Panel B) reports the Shapley values assessing the marginal contribution of $\overline{Pr(Y_{s,t+1})}$ ($Pr(Y_{p,t+1})$ and $\overline{Pr(Y_{others,t+1})}$) to the R^2 of the respective model. In Panel A (Panel B) heteroskedasticity-robust standard errors are clustered at the parent (subsidiary) and year level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively. All variables are defined in the paper Appendix. The subscripts p, and s are used to identify parent- and subsidiary-level variables, respectively.