

Internet Appendices

Internet Appendix IA: Descriptive Statistics LMZ Analyses

Variables	Big N			Other audit firms			Difference	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median
Panel A: Big N (N=78,414) versus Other audit firms (N=19,477): Absolute DAC								
Audit quality proxies								
Absolute DAC	0.079	0.049	0.093	0.131	0.085	0.132	-0.051***	-0.036***
<i>Matching variables</i>								
Log(assets)	5.283	5.160	2.165	2.734	2.538	1.859	2.550***	2.621***
Asset turnover ratio	1.146	1.003	0.822	1.202	1.033	0.982	-0.056***	-0.030
Current ratio	2.914	1.955	3.262	3.055	1.725	4.152	-0.141***	0.231***
Leverage	0.253	0.213	0.241	0.279	0.193	0.331	-0.027***	0.020***
ROA	-0.042	0.031	0.263	-0.207	-0.025	0.491	0.166***	0.057***
<i>Control variables</i>								
Current ratio	2.914	1.955	3.262	3.055	1.725	4.152	-0.141***	0.231***
Leverage	0.253	0.213	0.241	0.279	0.193	0.331	-0.027***	0.020***
ROA	-0.042	0.031	0.263	-0.207	-0.025	0.491	0.166***	0.057***
Log(market value)	5.160	5.102	2.282	2.709	2.582	1.969	2.451***	2.519***
Panel B: Big N (N=22,580) versus Other audit firms (N=1,073): cost of equity capital								
Audit quality proxy								
Cost of equity capital	0.125	0.096	0.109	0.140	0.106	0.114	-0.014***	-0.010***
Matching variables								
Log(assets)	7.010	6.930	1.713	5.975	5.763	1.646	1.035***	1.167***
Asset turnover ratio	1.094	0.951	0.703	1.019	0.869	0.667	0.075***	0.082***
Current ratio	2.153	1.726	1.558	2.414	1.922	1.729	-0.262***	-0.197***
Leverage	0.268	0.258	0.188	0.251	0.236	0.197	0.017***	0.022***
ROA	0.050	0.052	0.090	0.048	0.054	0.107	0.002	-0.001
Control variables								
Beta	1.150	1.037	0.867	1.280	1.152	1.054	-0.130***	-0.115***
Earnings variability	0.124	0.060	0.217	0.119	0.060	0.185	0.006	0.000**
Growth	0.477	0.205	1.037	0.518	0.246	0.945	-0.041	-0.040**
Log(book-to-market)	-0.914	-0.846	0.703	-0.866	-0.802	0.640	-0.048**	-0.044*
Log(leverage)	-1.640	-1.246	1.383	-1.888	-1.260	1.694	0.248***	0.013**
Log(market value)	7.050	6.955	1.716	6.102	5.986	1.472	0.948***	0.969***
Panel C: Big N (N=30,299) versus Other audit firms (N=1,354): analyst forecast accuracy								
Audit quality proxy								
Analyst forecast accuracy	-0.013	-0.001	0.062	-0.020	-0.002	0.125	0.007***	0.000***
Matching variables								
Log(assets)	6.672	6.557	1.778	5.774	5.524	1.644	0.899***	1.032***
Asset turnover ratio	1.092	0.955	0.737	1.016	0.887	0.681	0.076***	0.068***
Current ratio	2.646	1.902	2.514	3.120	2.306	2.705	-0.475***	-0.404***
Leverage	0.246	0.225	0.209	0.217	0.165	0.214	0.029***	0.060***
ROA	0.032	0.052	0.142	0.040	0.058	0.147	-0.009**	-0.005***
Control variables								
Actual eps _{t+1}	0.724	0.700	2.282	0.494	0.560	2.488	0.230***	0.140***
Analyst following	2.567	2.565	0.685	2.231	2.079	0.634	0.336***	0.486***
Horizon	3.411	3.497	0.465	3.430	3.526	0.483	-0.019	-0.030**
Log(market value) _{t+1}	6.772	6.657	1.743	5.983	5.821	1.526	0.789***	0.836***
Loss _{t+1}	0.219	0.000	0.414	0.212	0.000	0.409	0.007	0.000
ROE volatility	112.144	18.657	335.283	37.230	7.090	99.203	74.914***	11.567***
Surprise	0.008	0.007	0.147	0.009	0.007	0.117	-0.001	0.000
Zmijevski bankruptcy score	0.140	0.037	0.222	0.094	0.010	0.185	0.046***	0.028***

Notes. This table presents descriptive statistics on all variables used in analyses that replicate LMZ. Big N equals one when a firm's annual financial statements are audited by a Big 5 auditor (Arthur Anderson, PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, or KPMG), and zero otherwise. All measures are as defined in Appendix A. Panel A provides descriptive statistics on the sample used for absolute DAC separately for Big N and non-Big N firms, Panel B reports descriptive statistics for cost of equity capital, and Panel C reports descriptive statistics for analyst forecast accuracy. All regressions include 2-digit SIC code and year indicators. Two-sample *t*-tests are used to test the differences in means, and Wilcoxon two-sample tests are used to test differences in medians. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Internet Appendix IB: Descriptive Statistics: Post-SOX Analyses

Variables	Big N			Other audit firms			Difference	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median
Panel A: Big N (N=18,683) versus Other audit firms (N=7,022): Absolute DAC and Restatements								
Audit quality proxies								
Absolute DAC	0.047	0.032	0.052	0.073	0.049	0.076	-0.026***	-0.017***
Restatement	0.014	0.000	0.118	0.022	0.000	0.145	-0.007***	0.000***
Matching variables								
Log(assets)	6.616	6.587	1.761	4.217	4.132	1.362	2.399***	2.455***
Asset turnover ratio	1.194	1.010	0.838	1.261	1.107	0.921	-0.067***	-0.098***
Current ratio	2.810	2.105	2.309	3.323	2.347	2.992	-0.513***	-0.241***
Leverage	0.202	0.161	0.208	0.157	0.076	0.202	0.045***	0.085***
ROA	-0.006	0.044	0.196	-0.087	0.008	0.279	0.081***	0.036***
Control variables								
Accruals _{t-1}	-0.070	-0.054	0.110	-0.083	-0.055	0.161	0.013***	0.001
Altman z-score	1.649	1.991	2.770	1.051	2.040	4.166	0.599***	-0.049***
Litigation	0.323	0.000	0.468	0.304	0.000	0.460	0.018***	0.000***
Log(assets)	6.616	6.587	1.761	4.217	4.132	1.362	2.399***	2.455***
Loss	0.291	0.000	0.454	0.472	0.000	0.499	-0.181***	0.000***
Market-to-book ratio	2.970	2.198	4.260	2.673	1.767	4.374	0.297***	0.431***
Operating cash flow	0.071	0.095	0.174	-0.003	0.050	0.238	0.074***	0.045***
Operating cash flow volatility	87.560	23.681	187.928	9.532	3.676	24.828	78.028***	20.006***
PP&E growth	11.021	3.024	40.200	13.552	0.075	57.409	-2.531***	2.949***
Sales growth	13.886	8.121	41.048	15.151	6.340	53.865	-1.265**	1.781***
Sales volatility	340.533	76.357	808.662	29.942	8.777	82.718	310.591***	67.580***
Shares issued	0.882	1.000	0.323	0.792	1.000	0.406	0.090***	0.000***
Stock return	0.202	0.095	0.648	0.152	0.000	0.757	0.050***	0.095***
Stock return volatility	0.124	0.108	0.071	0.158	0.137	0.090	-0.034***	-0.029***
Total leverage	0.494	0.480	0.252	0.422	0.369	0.266	0.072***	0.111***
# Geographic segments	2.709	2.000	2.359	1.919	1.000	2.173	0.790***	1.000***
# Operating segments	2.052	1.000	1.681	1.678	1.000	1.243	0.375***	0.000***
Panel B: Big N (N=9,692) versus Other audit firms (N=3,632): Income-increasing DAC								
Audit quality proxy								
Income-increasing DAC	0.046	0.032	0.049	0.072	0.049	0.075	-0.027***	-0.017***
Matching variables								
Log(assets)	6.639	6.621	1.754	4.274	4.214	1.377	2.365***	2.407***
Asset turnover ratio	1.172	0.991	0.837	1.281	1.123	0.957	-0.109***	-0.131***
Current ratio	3.070	2.233	2.670	3.764	2.640	3.407	-0.695***	-0.408***
Leverage	0.205	0.165	0.210	0.158	0.069	0.207	0.047***	0.096***
ROA	0.011	0.050	0.181	-0.050	0.028	0.258	0.061***	0.022***
Control variables								
Accruals _{t-1}	-0.059	-0.047	0.100	-0.068	-0.046	0.150	0.010***	-0.001
Altman z-score	1.792	2.051	2.640	1.442	2.259	4.028	0.350***	-0.208***
Litigation	0.321	0.000	0.467	0.317	0.000	0.465	0.004	0.000***
Log(assets)	6.639	6.621	1.754	4.274	4.214	1.377	2.365***	2.407***
Loss	0.247	0.000	0.431	0.397	0.000	0.489	-0.150***	0.000***
Market-to-book ratio	2.885	2.191	3.735	2.736	1.837	3.926	0.149**	0.354***
Operating cash flow	0.054	0.082	0.166	-0.022	0.034	0.229	0.076***	0.048***
Operating cash flow volatility	82.114	21.967	180.017	9.554	3.702	26.082	72.561***	18.266***
PP&E growth	12.980	4.424	40.955	15.886	2.338	57.118	-2.906***	2.086***
Sales growth	14.941	8.805	43.457	18.508	8.893	56.301	-3.567***	-0.089
Sales volatility	319.537	78.008	733.114	30.747	9.236	77.636	288.790***	68.772***

Shares issued	0.890	1.000	0.313	0.805	1.000	0.397	0.085***	0.000***
Stock return	0.220	0.115	0.631	0.189	0.018	0.739	0.031**	0.097***
Stock return volatility	0.121	0.104	0.068	0.154	0.133	0.089	-0.033***	-0.028***

Appendix D (Continued)

Total leverage	0.478	0.468	0.246	0.393	0.342	0.254	0.085***	0.126***
# Geographic segments	2.702	2.000	2.381	1.990	1.000	2.249	0.712***	1.000***
# Operating segments	2.067	1.000	1.691	1.699	1.000	1.277	0.368***	0.000***

Panel C: Big N (N=4,735) versus Other audit firms (N=2,904): going concern opinions

Audit quality proxy								
Going concern	0.028	0.000	0.166	0.029	0.000	0.168	-0.001	0.000
Matching variables								
Log(assets)	5.518	5.362	1.579	3.839	3.704	1.285	1.680***	1.659***
Asset turnover ratio	0.901	0.697	0.828	1.052	0.871	0.925	-0.151***	-0.174***
Current ratio	3.660	2.474	3.627	3.781	2.276	4.301	-0.121	0.198***
Leverage	0.203	0.111	0.245	0.164	0.070	0.218	0.040***	0.041***
ROA	-0.202	-0.104	0.261	-0.229	-0.116	0.315	0.027***	0.012*
Control variables								
Future finance	0.917	1.000	0.276	0.836	1.000	0.370	0.081***	0.000***
Idiosyncratic volatility	0.145	0.126	0.078	0.164	0.142	0.096	-0.019***	-0.016***
Investments	0.376	0.291	0.310	0.312	0.215	0.286	0.064***	0.076***
Log(assets)	5.518	5.362	1.579	3.839	3.704	1.285	1.680***	1.659***
Log(firm age)	2.563	2.565	0.669	2.619	2.639	0.663	-0.056***	-0.074***
Loss _{t-1}	0.668	1.000	0.471	0.703	1.000	0.457	-0.036***	0.000***
Operating cash flow	-0.094	-0.009	0.259	-0.135	-0.043	0.285	0.041***	0.034***
Reporting lag	56.508	55.000	21.706	73.046	74.000	21.321	-16.538***	-19.000***
Stock return	-0.010	-0.138	0.664	-0.024	-0.169	0.705	0.014	0.031**
Stock return beta	1.745	1.570	1.633	1.416	1.176	1.812	0.328***	0.394***
Total leverage	0.504	0.471	0.308	0.436	0.382	0.289	0.068***	0.089***
Total leverage increase	0.040	0.026	0.166	0.027	0.022	0.177	0.013***	0.004***
Zmijevski bankruptcy score	0.303	0.128	0.351	0.277	0.089	0.347	0.027***	0.039***

Notes. This table presents descriptive statistics on all variables used in post-SOX analyses (2004-2013). Big N equals one when a firm's annual financial statements are audited by a Big 4 auditor (PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, or KPMG), and zero otherwise. All measures are as defined in Appendix B. Panel A provides descriptive statistics on the sample used for absolute DAC (discretionary accrual regression models include 2-digit SIC code, year, and closest SEC office indicators) and restatement analyses (restatement regression model includes year and closest SEC office indicators, and absolute discretionary accruals) separately for Big N and non-Big N firms, panel B reports descriptive statistics for income-increasing DAC (only firm-year observations with positive discretionary accruals are included), and panel C reports descriptive statistics for the going concern opinion analyses. Two-sample *t*-tests are used to test the differences in means, and Wilcoxon two-sample tests are used to test differences in medians. *, **, and *** indicate two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Internet Appendix IC: Effects of LMZ's Winsorization and Accrual Estimation Research Design Choices

Panel A: Replicating LMZ without Correcting their Winsorization and Accrual Estimation Research Design Choices

Included samples	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Without replacement	11,603	1.000	0.812	0.144	-0.011	-0.012	0.010	-0.037	0.023	0.866	0.450	0.228	0.033
With replacement	6,341	2.782	1.923	0.264	0.000	-0.002	0.038	-0.797	0.674	0.564	0.061	0.025	0.005

Panel B: Winsorization of Compustat Data Items as Opposed to Variables

	% Change in Variance		Rank Correlation	
	LMZ	Conventional	LMZ	Conventional
Accrual Model Inputs				
Total Accruals	-11.4%	-32.9%	0.994	1.000
1/Total Assets	-70.6%	-76.1%	1.000	1.000
ΔSales	-1.9%	-34.2%	0.995	1.000
PP&E	-0.7%	-1.4%	0.998	1.000
ROA	-4.0%	-23.4%	0.692	1.000
Matching variables				
Log(assets)	-1.1%	-1.3%	1.000	1.000
Asset turnover ratio	-0.5%	-14.5%	0.996	1.000
Current ratio	-66.4%	-79.1%	0.997	1.000
Leverage	-0.5%	-2.1%	0.998	1.000
ROA	-4.0%	-23.4%	0.692	1.000
Control variables				
Current ratio	-66.4%	-79.1%	0.997	1.000
Leverage	-0.5%	-2.1%	0.998	1.000
ROA	-4.0%	-23.4%	0.692	1.000
Log(market value)	-1.6%	-1.4%	0.999	1.000

Panel C: Effects of Omitting Standard Data Requirements for Accrual Model Estimation on Mean Square Error

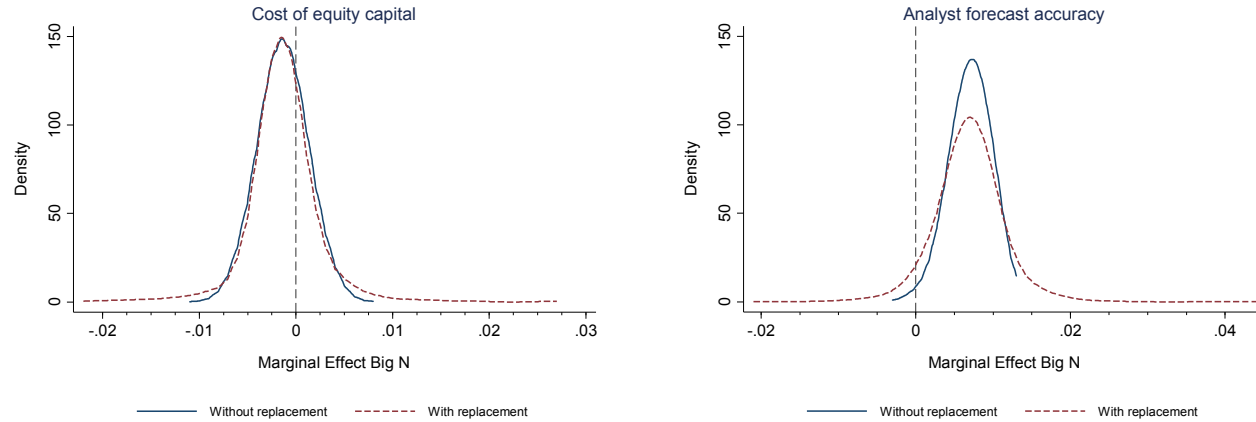
	LMZ			Conventional		
	Mean	Std. Dev.	Skewness	Mean	Std. Dev.	Skewness
Mean Square Error	0.138	0.502	23.234	0.114	0.045	0.396

Notes. This appendix examines how LMZ's winsorization and accrual estimation research design choices affect the Big N effect. Panel A presents the results of an analysis that repeats the analysis presented in Figure 1 using the research design choices made by LMZ. *Nobs* is the average number of treatment firms retained in matched samples, *Reuse* equals the average of the average number of times each control firm is matched to treatment firms, *Std. Bias* equals the average of the average of the absolute standardized percentage bias across all covariates, *L1* equals the average multivariate *L1*, *PCT Sign* is the percentage of treatment effects that are in the predicted direction, and *PCT Significant* is the percentage of treatment effects that are in the predicted direction and significant at $p < 10%$, $p < 5%$, and $p < 1%$ (two-tailed). We classify matched samples as balanced when univariate t-tests cannot reject the null hypothesis that the means of the matching variables do not differ between Big N and non-

Big N clients ($p > 10\%$, two-tailed). Further, we estimate all regressions using probability weights derived from the matching procedure and cluster standard errors at the firm level (Dehejia and Wahba 2002). Panel B presents a comparison between LMZ's winsorization of the Compustat Data Items and the more conventional method of winsorizing the variables used in the analyses. Specifically, it compares the variance of the winsorized variables and their rank correlation with the unwinsorized variables. For the purpose of this comparison, we only include firm-year observations that appear in both our and LMZ's sample. Panel C examines how the estimation of discretionary accruals is affected by not imposing a minimum number of observations per industry-year group and not excluding firm-year observations with accruals larger than assets. Specifically, the panel compares the distribution of the Mean Square Errors of the discretionary accruals models by firm and year using LMZ's approach compared with our conventional approach.

Internet Appendix ID: LMZ Replication: Cost of Equity Capital and Analyst Forecast Accuracy

Density plots



Descriptive Statistics

Panel A: Cost of equity capital													
Included samples	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Without replacement	1,064	1.000	2.557	0.799	-0.001	-0.001	0.002	-0.011	0.008	0.654	0.022	0.005	0.000
With replacement	4,737	10.041	2.356	0.815	-0.001	-0.001	0.004	-0.022	0.027	0.670	0.026	0.010	0.002

Panel B: Analyst forecast accuracy													
Included samples	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Without replacement	1,338	1.000	2.214	0.673	0.007	0.007	0.002	-0.003	0.013	0.003	0.000	0.000	0.000
With replacement	7,917	13.011	1.864	0.718	0.007	0.007	0.004	-0.021	0.044	0.039	0.001	0.000	0.000

Notes. This appendix repeats the analysis presented in Figure 1 for cost of equity capital and analyst forecast accuracy. See Appendix A for variable definitions and Panels B and C of Appendix C for regression specifications. The density plots are based on Big N coefficient estimates derived from OLS regressions. The table presents summary statistics for the regression results presented in the density plot, where *Nobs* equals the average number of treatment firms retained in matched samples, *Reuse* equals the average of the average number of times included control firms are matched to treatment firms, *Std. Bias* equals the average of the average of the absolute standardized percentage bias across all covariates, *L1* equals the average multivariate *L1*, *PCT Sign* is the fraction of treatment effects that are in the predicted direction (negative), and *PCT Significant* is the fraction of treatment effects that are in the predicted direction and significant at either $p < 10\%$, $p < 5\%$, or $p < 1\%$ (two-tailed). We classify matched samples as balanced when univariate t-tests cannot reject the null hypothesis that the means of the

matching variables do not differ between Big N and non-Big N clients ($p > 10\%$, two-tailed). Further, we estimate all regressions using probability weights derived from the matching procedure and cluster standard errors at the firm level (Dehejia and Wahba 2002).

Internet Appendix IE: Alternative Covariate Balance Criteria

IE Table 2 Descriptive Statistics LMZ Analysis – Absolute Discretionary Accruals

<i>Goodness-of-fit test</i>													
Included samples	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Without replacement	16,418	1.000	0.773	0.390	-0.003	-0.003	0.001	-0.006	-0.001	1.000	0.814	0.613	0.189
With replacement	33,991	4.993	1.294	0.444	-0.005	-0.005	0.002	-0.033	0.007	0.986	0.894	0.833	0.681
<i>Standardized bias test</i>													
Included samples	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Without replacement	16,418	1.000	0.837	0.390	-0.003	-0.003	0.001	-0.006	-0.001	1.000	0.826	0.615	0.203
With replacement	43,941	6.057	1.285	0.435	-0.005	-0.005	0.001	-0.015	0.002	0.999	0.940	0.890	0.743

IE Table 3 Descriptive Statistics Post-SOX Analysis – Four Audit Quality Measures

<i>Goodness-of-fit test</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,507	1.000	1.972	0.693	-0.007	-0.007	0.001	-0.010	-0.004	1.000	1.000	1.000	0.999
Income-increasing DAC	2,380	1.000	2.263	0.717	-0.007	-0.007	0.001	-0.011	-0.004	1.000	1.000	0.999	0.981
Restatements	4,513	1.000	1.984	0.693	-0.006	-0.006	0.002	-0.011	0.001	0.997	0.690	0.524	0.209
Going concern opinions	1,763	1.000	2.030	0.643	0.023	0.023	0.003	0.003	0.032	1.000	0.999	0.997	0.972
Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	14,297	6.207	2.876	0.774	-0.004	-0.003	0.002	-0.012	0.000	0.998	0.813	0.641	0.337
Income-increasing DAC	8,860	7.220	3.505	0.820	-0.004	-0.004	0.001	-0.010	-0.001	1.000	0.919	0.760	0.254
Restatements	14,548	6.262	2.857	0.774	-0.001	-0.001	0.002	-0.013	0.004	0.542	0.064	0.032	0.009
Going concern opinions	4,664	4.994	3.880	0.764	0.017	0.017	0.002	0.009	0.025	1.000	0.996	0.986	0.867
<i>Standardized bias test</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,438	1.000	1.417	0.693	-0.007	-0.007	0.001	-0.010	-0.004	1.000	1.000	0.999	0.996
Income-increasing DAC	2,310	1.000	1.312	0.717	-0.007	-0.007	0.001	-0.014	-0.004	1.000	0.997	0.995	0.961
Restatements	4,449	1.000	1.419	0.693	-0.006	-0.006	0.002	-0.013	0.001	0.994	0.716	0.535	0.208
Going concern opinions	1,730	1.000	1.290	0.646	0.023	0.023	0.003	0.011	0.036	1.000	0.999	0.992	0.947
Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	9,227	4.395	1.308	0.737	-0.006	-0.006	0.002	-0.014	-0.001	1.000	0.968	0.944	0.770
Income-increasing DAC	5,952	5.143	1.244	0.774	-0.006	-0.006	0.002	-0.015	0.001	0.999	0.981	0.944	0.755
Restatements	9,056	4.382	1.290	0.737	-0.003	-0.003	0.003	-0.018	0.006	0.811	0.209	0.122	0.027
Going concern opinions	3,299	3.768	1.345	0.723	0.018	0.018	0.003	0.007	0.035	1.000	0.968	0.928	0.769

IE Table 4 Descriptive Statistics Post-SOX Analysis – Second Tier and Small Auditors

Goodness-of-fit test

Panel A: Effect of Matching Method on the Representation of Second Tier Firms

Audit quality measure	Before matching	Matching without replacement	Matching with replacement
Absolute DAC	0.472	0.557	0.716
Income-increasing DAC	0.463	0.544	0.726
Restatements	0.472	0.557	0.717
Going concern opinions	0.429	0.499	0.612

Panel B: Matching without replacement – Big N versus Second Tier

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	3,082	1.000	1.734	0.689	-0.003	-0.003	0.001	-0.005	0.000	0.994	0.307	0.114	0.008
Income-increasing DAC	1,571	1.000	2.289	0.712	-0.002	-0.002	0.001	-0.006	0.001	0.945	0.096	0.023	0.001
Restatements	3,074	1.000	1.701	0.689	-0.005	-0.005	0.002	-0.012	0.008	0.995	0.446	0.270	0.067
Going concern opinions	1,146	1.000	2.641	0.694	0.016	0.016	0.004	0.001	0.029	1.000	0.679	0.254	0.001

Panel C: Matching with replacement – Big N versus Second Tier

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	15,917	10.830	3.104	0.811	-0.001	-0.001	0.001	-0.018	0.011	0.513	0.040	0.018	0.003
Income-increasing DAC	8,856	11.807	3.200	0.847	0.000	0.000	0.001	-0.005	0.003	0.325	0.001	0.001	0.000
Restatements	16,077	10.682	3.123	0.812	0.000	0.001	0.002	-0.014	0.005	0.274	0.007	0.004	0.003
Going concern opinions	4,653	8.350	3.893	0.804	0.015	0.015	0.002	0.004	0.023	1.000	0.913	0.761	0.207

Panel D: Matching without replacement – Big N versus Small Auditors

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	2,419	1.000	2.516	0.764	-0.013	-0.013	0.001	-0.018	-0.008	1.000	1.000	1.000	1.000
Income-increasing DAC	1,295	1.000	2.929	0.775	-0.012	-0.012	0.002	-0.017	-0.007	1.000	0.999	0.999	0.976
Restatements	2,418	1.000	2.557	0.764	-0.008	-0.008	0.002	-0.018	0.002	0.997	0.705	0.522	0.182
Going concern opinions	1,070	1.000	2.702	0.751	0.035	0.035	0.004	0.021	0.049	1.000	1.000	0.999	0.945

Panel E: Matching with replacement – Big N versus Small Auditors

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	9,471	7.722	4.141	0.842	-0.013	-0.013	0.002	-0.026	-0.004	1.000	0.999	0.999	0.993
Income-increasing DAC	5,526	8.291	5.195	0.858	-0.015	-0.015	0.002	-0.024	-0.001	1.000	0.997	0.997	0.990
Restatements	9,489	7.713	4.196	0.842	-0.007	-0.007	0.003	-0.038	0.008	0.986	0.481	0.324	0.104
Going concern opinions	3,818	6.773	5.317	0.838	0.021	0.021	0.003	0.010	0.035	1.000	0.982	0.930	0.500

Standardized bias test

Panel A: Effect of Matching Method on the Representation of Second Tier Firms

Audit quality measure	Before matching	Matching without replacement	Matching with replacement
Absolute DAC	0.472	0.559	0.663
Income-increasing DAC	0.463	0.546	0.666
Restatements	0.472	0.559	0.661
Going concern opinions	0.429	0.500	0.567

Panel B: Matching without replacement – Big N versus Second Tier

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	3,017	1.000	1.252	0.690	-0.003	-0.003	0.001	-0.007	0.000	0.994	0.342	0.141	0.012
Income-increasing DAC	1,498	1.000	1.317	0.715	-0.002	-0.002	0.001	-0.009	0.003	0.958	0.129	0.042	0.003
Restatements	3,028	1.000	1.251	0.690	-0.005	-0.005	0.002	-0.011	0.005	0.987	0.448	0.261	0.074
Going concern opinions	1,087	1.000	1.351	0.691	0.015	0.015	0.004	-0.004	0.030	0.998	0.588	0.223	0.003

Panel C: Matching with replacement – Big N versus Second Tier

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	8,623	6.460	1.276	0.752	-0.002	-0.002	0.001	-0.011	0.003	0.926	0.261	0.117	0.008
Income-increasing DAC	5,402	7.632	1.286	0.785	-0.002	-0.002	0.002	-0.014	0.005	0.867	0.192	0.076	0.005
Restatements	8,856	6.493	1.281	0.752	-0.002	-0.001	0.003	-0.025	0.008	0.665	0.049	0.023	0.007
Going concern opinions	3,013	5.840	1.408	0.748	0.014	0.014	0.004	-0.006	0.028	0.996	0.670	0.418	0.066

Panel D: Matching without replacement – Big N versus Small Auditors

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	2,272	1.000	1.322	0.769	-0.013	-0.013	0.002	-0.020	-0.007	1.000	0.999	0.998	0.995
Income-increasing DAC	1,226	1.000	1.347	0.780	-0.012	-0.012	0.002	-0.024	-0.005	1.000	0.995	0.995	0.964
Restatements	2,276	1.000	1.347	0.768	-0.008	-0.008	0.003	-0.018	0.004	0.994	0.653	0.476	0.182
Going concern opinions	1,041	1.000	1.340	0.744	0.034	0.034	0.005	0.011	0.051	1.000	0.997	0.987	0.848

Panel E: Matching with replacement – Big N versus Small Auditors

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,115	3.971	1.275	0.806	-0.013	-0.013	0.002	-0.024	0.002	0.999	0.991	0.989	0.975
Income-increasing DAC	2,981	4.893	1.304	0.828	-0.014	-0.014	0.002	-0.025	0.009	0.999	0.993	0.990	0.964
Restatements	4,347	4.115	1.286	0.805	-0.008	-0.008	0.004	-0.021	0.007	0.985	0.595	0.408	0.145
Going concern opinions	2,399	4.520	1.385	0.789	0.023	0.023	0.004	0.008	0.039	1.000	0.973	0.916	0.553

IE Table 5 Descriptive Statistics Post-SOX Analysis: Coarsened Exact Matching

<i>Goodness-of-fit test</i>												
Audit quality measure	Nobs	Mean	Std. Bias	L1	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
							Min.	Max.		10%	5%	1%
Absolute DAC	8,310	1.194	0.591	-0.005	-0.005	0.001	-0.009	-0.001	1.000	0.983	0.931	0.565
Income-increasing DAC	4,241	1.539	0.615	-0.005	-0.005	0.001	-0.010	-0.001	1.000	0.982	0.934	0.619
Restatements	8,290	1.177	0.591	0.000	0.000	0.002	-0.007	0.009	0.367	0.002	0.000	0.000
Going concern opinions	2,397	1.895	0.564	0.017	0.017	0.003	0.006	0.027	1.000	0.954	0.869	0.463

<i>Standardized bias test</i>												
Audit quality measure	Nobs	Mean	Std. Bias	L1	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
							Min.	Max.		10%	5%	1%
Absolute DAC	7,242	0.903	0.557	-0.005	-0.005	0.001	-0.009	-0.001	1.000	0.980	0.930	0.577
Income-increasing DAC	3,400	0.973	0.559	-0.006	-0.006	0.001	-0.010	-0.002	1.000	0.981	0.922	0.592
Restatements	7,270	0.900	0.559	0.000	0.000	0.002	-0.007	0.008	0.367	0.003	0.000	0.000
Going concern opinions	2,008	1.378	0.518	0.017	0.017	0.003	0.002	0.026	1.000	0.861	0.683	0.242

IE Table 6 Descriptive Statistics Post-SOX Analysis: Efficient Frontier

<i>Goodness-of-fit test</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,507	1.000	2.031	0.676	-0.007	-0.007	0.001	-0.009	-0.005	1.000	1.000	1.000	1.000
Income-increasing DAC	2,382	1.000	2.261	0.700	-0.007	-0.007	0.001	-0.009	-0.004	1.000	1.000	0.986	0.942
Restatements	4,471	1.000	1.941	0.676	-0.005	-0.006	0.002	-0.010	-0.002	1.000	0.622	0.473	0.176
Going concern opinions	1,753	1.000	1.905	0.629	0.023	0.022	0.003	0.015	0.029	1.000	1.000	1.000	0.986
Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	13,122	7.157	2.445	0.749	-0.005	-0.004	0.001	-0.012	-0.002	1.000	0.949	0.869	0.576
Income-increasing DAC	8,537	7.801	3.304	0.808	-0.004	-0.005	0.001	-0.007	-0.001	1.000	0.909	0.778	0.394
Restatements	13,414	7.189	2.469	0.751	-0.002	-0.001	0.002	-0.010	0.001	0.724	0.041	0.020	0.010
Going concern opinions	4,500	5.875	3.599	0.745	0.017	0.017	0.002	0.013	0.021	1.000	1.000	1.000	0.910
<i>Standardized bias test</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,416	1.000	1.392	0.675	-0.007	-0.007	0.001	-0.010	-0.004	1.000	1.000	1.000	0.986
Income-increasing DAC	2,299	1.000	1.327	0.699	-0.007	-0.007	0.001	-0.009	-0.004	1.000	1.000	1.000	0.907
Restatements	4,435	1.000	1.444	0.675	-0.005	-0.005	0.002	-0.013	-0.002	1.000	0.662	0.446	0.216
Going concern opinions	1,718	1.000	1.207	0.631	0.023	0.023	0.003	0.017	0.030	1.000	1.000	0.986	0.946
Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	8,812	5.054	1.270	0.719	-0.006	-0.005	0.001	-0.009	-0.002	1.000	0.960	0.960	0.820
Income-increasing DAC	5,612	6.056	1.229	0.752	-0.007	-0.007	0.002	-0.011	-0.003	1.000	0.990	0.980	0.900
Restatements	8,683	4.879	1.237	0.718	-0.003	-0.003	0.003	-0.010	0.004	0.820	0.230	0.070	0.030
Going concern opinions	3,120	4.540	1.245	0.700	0.018	0.018	0.003	0.012	0.035	1.000	0.990	0.930	0.790

IE Table 7 Descriptive Statistics Post-SOX Analysis: Five Additional Matching Variables

<i>Goodness-of-fit test</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,432	1.000	1.563	0.987	-0.007	-0.007	0.001	-0.010	-0.003	1.000	1.000	0.999	0.987
Income-increasing DAC	2,292	1.000	2.084	0.962	-0.009	-0.009	0.001	-0.013	-0.005	1.000	0.999	0.999	0.998
Restatements	4,390	1.000	1.459	0.914	-0.006	-0.006	0.002	-0.011	0.002	0.999	0.773	0.607	0.236
Going concern opinions	1,697	1.000	1.983	0.979	0.024	0.025	0.003	0.013	0.040	1.000	0.999	0.999	0.985
Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	15,702	6.712	3.155	0.994	-0.004	-0.004	0.001	-0.010	0.000	0.996	0.801	0.633	0.272
Income-increasing DAC	6,721	5.869	3.504	0.981	-0.008	-0.007	0.002	-0.020	0.001	0.999	0.982	0.937	0.722
Restatements	13,592	6.085	2.877	0.954	-0.001	-0.001	0.003	-0.016	0.005	0.509	0.106	0.062	0.017
Going concern opinions	4,603	5.084	3.855	0.990	0.018	0.018	0.002	-0.001	0.027	0.999	0.996	0.983	0.852
<i>Standardized bias test</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,399	1.000	1.108	0.987	-0.007	-0.007	0.001	-0.010	-0.003	1.000	1.000	1.000	0.989
Income-increasing DAC	2,271	1.000	1.210	0.988	-0.007	-0.007	0.001	-0.011	-0.004	1.000	1.000	0.999	0.963
Restatements	4,304	1.000	1.221	0.992	-0.005	-0.005	0.002	-0.011	0.001	0.998	0.628	0.446	0.167
Going concern opinions	1,610	1.000	1.249	0.998	0.025	0.025	0.003	0.012	0.039	1.000	1.000	0.998	0.967
Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	9,120	4.303	1.194	0.990	-0.006	-0.006	0.001	-0.011	-0.001	1.000	0.990	0.978	0.857
Income-increasing DAC	5,173	4.548	1.241	0.992	-0.007	-0.007	0.001	-0.012	-0.002	1.000	0.996	0.992	0.921
Restatements	9,076	4.421	1.197	0.994	-0.001	-0.001	0.003	-0.015	0.006	0.582	0.094	0.050	0.013
Going concern opinions	2,782	3.428	1.352	0.998	0.022	0.021	0.003	0.010	0.033	1.000	0.997	0.986	0.888

Notes. This appendix repeats the analyses presented in the manuscript after imposing two alternative covariate balance criteria. For the panels and tables labeled *Goodness-of-fit test* we classify matched samples as balanced when a Wald test cannot reject the null hypothesis that the matching variables do not explain the use of a Big *N* auditor ($p > 10\%$, two-tailed), and for the table labeled *Standardized bias test* we classify matched samples as balanced when the absolute standardized bias is smaller than 3% for all matching covariates.

Internet Appendix IF: Post-SOX Analysis – Varying the Number of Iterations

Test of significance

Panel A: 2,000 Iterations – Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,467	1.000	1.550	0.693	-0.007	-0.007	0.001	-0.010	0.002	0.999	0.998	0.998	0.996
Income-increasing DAC	2,368	1.000	1.788	0.717	-0.007	-0.007	0.001	-0.014	-0.004	1.000	0.999	0.998	0.972
Restatements	4,464	1.000	1.527	0.693	-0.006	-0.006	0.002	-0.011	0.001	0.993	0.722	0.531	0.224
Going concern opinions	1,758	1.000	1.671	0.643	0.023	0.023	0.003	0.014	0.035	1.000	0.999	0.999	0.976

Panel B: 2,000 Iterations – Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,563	2.984	1.886	0.740	-0.007	-0.006	0.003	-0.034	0.012	0.983	0.887	0.850	0.742
Income-increasing DAC	4,096	4.020	1.854	0.766	-0.007	-0.007	0.003	-0.027	0.008	0.992	0.922	0.887	0.746
Restatements	5,177	3.175	1.531	0.729	-0.004	-0.004	0.004	-0.028	0.010	0.881	0.237	0.156	0.063
Going concern opinions	3,106	3.637	1.817	0.722	0.018	0.018	0.004	-0.004	0.034	0.997	0.956	0.911	0.702

Panel C: 5,000 Iterations – Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,461	1.000	1.547	0.693	-0.007	-0.007	0.001	-0.010	0.014	0.999	0.998	0.997	0.996
Income-increasing DAC	2,365	1.000	1.805	0.717	-0.007	-0.007	0.001	-0.014	-0.003	1.000	0.999	0.997	0.975
Restatements	4,464	1.000	1.522	0.693	-0.006	-0.006	0.002	-0.013	0.002	0.994	0.706	0.517	0.202
Going concern opinions	1,762	1.000	1.682	0.643	0.023	0.023	0.003	0.012	0.035	1.000	1.000	0.998	0.980

Panel D: 5,000 Iterations – Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,628	3.007	1.865	0.74	-0.007	-0.006	0.003	-0.034	0.012	0.984	0.891	0.857	0.742
Income-increasing DAC	4,043	3.949	1.877	0.765	-0.007	-0.007	0.003	-0.027	0.011	0.986	0.915	0.874	0.731
Restatements	5,172	3.129	1.497	0.729	-0.004	-0.004	0.004	-0.038	0.011	0.879	0.244	0.161	0.06
Going concern opinions	3,075	3.622	1.807	0.721	0.018	0.018	0.004	-0.004	0.036	0.998	0.952	0.907	0.696

Goodness-of-fit test

Panel A: 2,000 Iterations – Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,506	1.000	1.964	0.693	-0.007	-0.007	0.001	-0.009	-0.004	1.000	1.000	1.000	1.000
Income-increasing DAC	2,379	1.000	2.266	0.716	-0.007	-0.007	0.001	-0.011	-0.004	1.000	1.000	1.000	0.987
Restatements	4,496	1.000	1.951	0.693	-0.005	-0.006	0.002	-0.012	0.000	0.999	0.687	0.524	0.190
Going concern opinions	1,766	1.000	2.061	0.643	0.023	0.023	0.003	0.013	0.031	1.000	1.000	0.999	0.982

Panel B: 2,000 Iterations – Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	14,211	6.176	2.872	0.774	-0.004	-0.003	0.002	-0.011	0.000	0.997	0.809	0.646	0.342
Income-increasing DAC	8,873	7.178	3.485	0.821	-0.004	-0.004	0.001	-0.009	-0.001	1.000	0.904	0.740	0.243
Restatements	14,485	6.256	2.862	0.774	-0.001	-0.001	0.002	-0.013	0.004	0.534	0.065	0.029	0.007
Going concern opinions	4,675	4.979	3.911	0.764	0.017	0.017	0.002	0.005	0.025	1.000	0.996	0.987	0.872

Panel C: 5,000 Iterations – Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,505	1.000	1.965	0.693	-0.007	-0.007	0.001	-0.010	-0.004	1.000	1.000	1.000	0.998
Income-increasing DAC	2,380	1.000	2.269	0.716	-0.007	-0.007	0.001	-0.011	-0.004	1.000	1.000	0.999	0.985
Restatements	4,505	1.000	1.964	0.694	-0.006	-0.006	0.002	-0.016	0.001	0.994	0.703	0.531	0.197
Going concern opinions	1,765	1.000	2.048	0.643	0.023	0.023	0.003	0.013	0.032	1.000	1.000	0.999	0.975

Panel D: 5,000 Iterations – Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	14,331	6.231	2.877	0.775	-0.004	-0.003	0.002	-0.016	0.003	0.997	0.812	0.644	0.346
Income-increasing DAC	8,859	7.199	3.493	0.820	-0.004	-0.004	0.001	-0.011	-0.001	1.000	0.905	0.739	0.237
Restatements	14,440	6.220	2.854	0.774	-0.001	-0.001	0.002	-0.022	0.006	0.533	0.069	0.037	0.008
Going concern opinions	4,673	5.005	3.895	0.764	0.017	0.017	0.002	0.005	0.026	1.000	0.997	0.990	0.856

Standardized bias test

Panel A: 2,000 Iterations – Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,428	1.000	1.414	0.693	-0.007	-0.007	0.001	-0.010	-0.004	1.000	1.000	0.999	0.995
Income-increasing DAC	2,309	1.000	1.294	0.717	-0.007	-0.007	0.001	-0.011	-0.003	1.000	0.997	0.994	0.970
Restatements	4,437	1.000	1.413	0.693	-0.006	-0.006	0.002	-0.014	0.000	0.994	0.702	0.511	0.205
Going concern opinions	1,739	1.000	1.279	0.645	0.023	0.023	0.003	0.013	0.034	1.000	0.999	0.997	0.952

Panel B: 2,000 Iterations – Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	9,099	4.343	1.310	0.737	-0.006	-0.006	0.002	-0.014	-0.002	1.000	0.969	0.944	0.770
Income-increasing DAC	6,005	5.159	1.245	0.775	-0.006	-0.006	0.002	-0.019	-0.001	1.000	0.977	0.954	0.771
Restatements	8,803	4.341	1.288	0.736	-0.003	-0.003	0.003	-0.020	0.007	0.822	0.204	0.135	0.050
Going concern opinions	3,301	3.798	1.355	0.724	0.018	0.018	0.003	0.002	0.034	1.000	0.970	0.937	0.760

Panel C: 5,000 Iterations – Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,430	1.000	1.416	0.693	-0.007	-0.007	0.001	-0.010	0.002	1.000	0.999	0.998	0.994
Income-increasing DAC	2,307	1.000	1.300	0.718	-0.007	-0.007	0.001	-0.019	0.004	1.000	0.997	0.994	0.965
Restatements	4,431	1.000	1.417	0.693	-0.006	-0.006	0.002	-0.014	0.003	0.993	0.690	0.514	0.207
Going concern opinions	1,737	1.000	1.281	0.645	0.023	0.023	0.003	-0.005	0.035	1.000	0.998	0.994	0.951

Panel D: 5,000 Iterations – Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	9,072	4.341	1.306	0.737	-0.006	-0.006	0.002	-0.014	-0.001	1.000	0.972	0.946	0.772
Income-increasing DAC	6,028	5.137	1.232	0.775	-0.006	-0.006	0.002	-0.024	0.003	0.999	0.981	0.952	0.763
Restatements	8,897	4.364	1.276	0.736	-0.003	-0.003	0.003	-0.020	0.007	0.812	0.206	0.128	0.040
Going concern opinions	3,299	3.794	1.346	0.724	0.018	0.018	0.003	0.002	0.037	1.000	0.972	0.937	0.762

Notes. This appendix repeats the analysis presented in Figure 2 after varying the number of iterations. Panels A and B present the results of 2,000 iterations and Panels C and D present the results of 5,000 iterations. *Nobs* equals the average number of treatment firms retained in matched samples, *Reuse* equals the average of the average number of times included control firms are matched to treatment firms, *Std. Bias* equals the average of the average of the absolute standardized percentage bias across all covariates, *L1* equals the average multivariate *L1*, *PCT Sign* is the fraction of treatment effects that are in the predicted direction, and *PCT Significant* is the fraction of treatment effects that are in the predicted direction and significant at either $p < 10\%$, $p < 5\%$, or $p < 1\%$ (two-tailed). For the table labeled *Test of significance* we classify matched samples as balanced when univariate t-tests cannot reject the null hypothesis that the means of the matching variables do not differ between Big N and non-Big N clients ($p > 10\%$, two-tailed), for the table labeled *Goodness-of-fit test* we classify matched samples as balanced when a Wald test cannot reject the null hypothesis that the matching variables do not explain the use of a Big N auditor ($p >$

10%, two-tailed), and for the table labeled *Standardized bias test* we classify matched samples as balanced when the absolute standardized bias is smaller than 3% for all matching covariates. We estimate all regressions using probability weights derived from the matching procedure and cluster standard errors at the firm level (Dehejia and Wahba 2002).

Internet Appendix IG: Bootstrapping

Test of significance

Panel A: LMZ Replication

Audit quality measure	Matching without replacement		Matching with replacement	
	Mean	Median	Mean	Median
Absolute DAC	-0.004***	-0.004***	-0.005***	-0.005***

Panel B: Post-SOX Analysis

Audit quality measure	Matching without replacement		Matching with replacement	
	Mean	Median	Mean	Median
Absolute DAC	-0.007***	-0.007***	-0.006***	-0.006***
Income-increasing DAC	-0.007***	-0.007***	-0.008***	-0.008***
Restatements	-0.006***	-0.005***	-0.004***	-0.003***
Going concern opinions	0.012***	0.011***	0.013***	0.014***

Goodness-of-fit test

Panel A: LMZ Replication

Audit quality measure	Matching without replacement		Matching with replacement	
	Mean	Median	Mean	Median
Absolute DAC	-0.004***	-0.004***	-0.005***	-0.005***

Panel B: Post-SOX Analysis

Audit quality measure	Matching without replacement		Matching with replacement	
	Mean	Median	Mean	Median
Absolute DAC	-0.007***	-0.007***	-0.005***	-0.005***
Income-increasing DAC	-0.008***	-0.007***	-0.007***	-0.006***
Restatements	-0.006***	-0.006***	-0.001***	0.000**
Going concern opinions	0.012***	0.012***	0.013***	0.014***

<i>Standardized bias test</i>				
Panel A: LMZ Replication				
Audit quality measure	Matching without replacement		Matching with replacement	
	Mean	Median	Mean	Median
Absolute DAC	-0.004***	-0.004***	-0.005***	-0.005***

Panel B: Post-SOX Analysis				
Audit quality measure	Matching without replacement		Matching with replacement	
	Mean	Median	Mean	Median
Absolute DAC	-0.007***	-0.007***	-0.006***	-0.006***
Income-increasing DAC	-0.008***	-0.007***	-0.008***	-0.008***
Restatements	-0.006***	-0.005***	-0.003***	-0.002***
Going concern opinions	0.011***	0.011***	0.013***	0.014***

Notes. This appendix presents statistical tests on Big N audit quality effects derived from an analysis that repeats the analyses presented in Figures 1 and 2 using bootstrapped samples. In order to take the panel structure of the original data into account, we randomly draw firms as opposed to observations. Subsequently, we repeat the analyses presented in Figures 1 and 2 using these bootstrapped samples. The bootstrap sample size equals 25% of the number of firms contained in the original sample. The predicted sign is negative for absolute DAC, income-increasing DAC, and restatements, positive for going concern opinions. For the table labeled *Test of significance* we classify matched samples as balanced when univariate t-tests cannot reject the null hypothesis that the means of the matching variables do not differ between Big N and non-Big N clients ($p > 10\%$, two-tailed), for the table labeled *Goodness-of-fit test* we classify matched samples as balanced when a Wald test cannot reject the null hypothesis that the matching variables do not explain the use of a Big N auditor ($p > 10\%$, two-tailed), and for the table labeled *Standardized bias test* we classify matched samples as balanced when the absolute standardized bias is smaller than 3% for all matching covariates. We estimate all regressions using probability weights derived from the matching procedure and cluster standard errors at the firm level (Dehejia and Wahba 2002). Using the Big N effects we perform t-tests to examine whether mean treatment effects are significantly different from zero and Wilcoxon rank-tests to examine whether median treatment effects are significantly different from zero. *** denotes statistical significance at the 1% level (two-tailed).

Internet Appendix IH: Post-SOX Analysis – Probability Differences vs. Logit Differences

Test of significance

Panel A: Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,426	1.000	1.529	0.698	-0.007	-0.007	0.001	-0.011	0.001	0.999	0.997	0.995	0.993
Income-increasing DAC	2,345	1.000	1.754	0.721	-0.007	-0.007	0.001	-0.011	-0.003	1.000	0.996	0.995	0.973
Restatements	4,441	1.000	1.501	0.698	-0.005	-0.006	0.002	-0.012	0.001	0.989	0.693	0.509	0.197
Going concern opinions	1,755	1.000	1.683	0.646	0.023	0.023	0.003	0.011	0.032	1.000	0.999	0.997	0.961

Panel B: Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	1,760	2.669	3.268	0.802	-0.005	-0.004	0.004	-0.034	0.016	0.888	0.470	0.358	0.132
Income-increasing DAC	2,136	3.270	2.776	0.795	-0.005	-0.006	0.004	-0.024	0.015	0.941	0.659	0.566	0.299
Restatements	2,754	2.990	2.172	0.777	-0.002	-0.002	0.005	-0.041	0.012	0.617	0.121	0.087	0.037
Going concern opinions	2,579	3.379	2.046	0.738	0.018	0.018	0.004	-0.011	0.034	0.998	0.904	0.833	0.602

Goodness-of-fit test

Panel A: Matching without replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,485	1.000	1.890	0.698	-0.007	-0.007	0.001	-0.010	-0.002	1.000	0.998	0.998	0.995
Income-increasing DAC	2,373	1.000	2.212	0.719	-0.007	-0.007	0.001	-0.010	-0.004	1.000	0.999	0.999	0.968
Restatements	4,494	1.000	1.905	0.698	-0.005	-0.005	0.002	-0.011	0.000	0.991	0.671	0.497	0.190
Going concern opinions	1,764	1.000	1.999	0.644	0.023	0.023	0.003	0.013	0.034	1.000	1.000	0.999	0.974

Panel B: Matching with replacement

Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	11,864	5.728	3.343	0.788	-0.003	-0.003	0.002	-0.020	0.006	0.979	0.691	0.472	0.113
Income-increasing DAC	8,868	7.250	3.864	0.823	-0.004	-0.004	0.001	-0.009	0.000	0.999	0.912	0.715	0.195
Restatements	12,939	6.029	3.224	0.786	0.000	0.000	0.002	-0.025	0.007	0.413	0.028	0.012	0.005
Going concern opinions	4,711	5.018	4.316	0.768	0.017	0.017	0.002	0.009	0.028	1.000	0.994	0.981	0.861

<i>Standardized bias</i>													
Panel A: Matching without replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	4,406	1.000	1.397	0.698	-0.007	-0.007	0.001	-0.011	-0.004	1.000	0.999	0.999	0.991
Income-increasing DAC	2,290	1.000	1.298	0.721	-0.007	-0.007	0.001	-0.011	-0.004	1.000	0.999	0.994	0.952
Restatements	4,401	1.000	1.390	0.698	-0.005	-0.006	0.002	-0.011	0.008	0.984	0.667	0.499	0.191
Going concern opinions	1,726	1.000	1.289	0.648	0.023	0.023	0.003	0.006	0.033	1.000	0.999	0.995	0.941

Panel B: Matching with replacement													
Audit quality measure	Nobs	Reuse	Std. Bias	L1	Mean	Median	Std. Dev.	Range		PCT Sign	PCT Significant		
								Min.	Max.		10%	5%	1%
Absolute DAC	7,326	4.334	1.429	0.774	-0.004	-0.004	0.002	-0.016	0.007	0.985	0.748	0.602	0.223
Income-increasing DAC	5,145	4.948	1.362	0.793	-0.005	-0.005	0.002	-0.019	0.004	0.997	0.917	0.837	0.413
Restatements	7,741	4.495	1.465	0.771	-0.001	-0.001	0.003	-0.016	0.012	0.561	0.060	0.035	0.012
Going concern opinions	3,055	3.721	1.383	0.741	0.018	0.018	0.003	0.001	0.031	1.000	0.959	0.910	0.706

Notes. This appendix presents the results of an analysis that repeats the analysis in Figure 2 using an alternative approach for varying match closeness. Specifically, instead of using caliper widths that are based on differences in logits we now use caliper widths based on differences in probability. The caliper width ranges in this analysis from a 0 to 0.03 probability difference. *Nobs* equals the average number of treatment firms retained in matched samples, *Reuse* equals the average of the average number of times included control firms are matched to treatment firms, *Std. Bias* equals the average of the average of the absolute standardized percentage bias across all covariates, *L1* equals the average multivariate *L1*, *PCT Sign* is the fraction of treatment effects that are in the predicted direction, and *PCT Significant* is the fraction of treatment effects that are in the predicted direction and significant at either $p < 10\%$, $p < 5\%$, or $p < 1\%$ (two-tailed). The predicted sign is negative for absolute DAC, income-increasing DAC, and restatements, positive for going concern opinions. For the table labeled *Test of significance* we classify matched samples as balanced when univariate t-tests cannot reject the null hypothesis that the means of the matching variables do not differ between Big N and non-Big N clients ($p > 10\%$, two-tailed), for the table labeled *Goodness-of-fit test* we classify matched samples as balanced when a Wald test cannot reject the null hypothesis that the matching variables do not explain the use of a Big N auditor ($p > 10\%$, two-tailed), and for the table labeled *Standardized bias* we classify matched samples as balanced when the absolute standardized bias is smaller than 3% for all matching covariates. We estimate all regressions using probability weights derived from the matching procedure and cluster standard errors at the firm level (Dehejia and Wahba 2002).