Online Appendix for

Explaining Corporate Capital Structure: Product Markets, Leases, and Asset Similarity

Section 1: Data

A. Overview of *Capital IQ*

Capital IQ (*CIQ*) is a Standard & Poor's business that collects a large amount of information on businesses throughout the world. We discovered the data available by *CIQ* through their internet interface (at http://www.capitaliq.com), which we recommend to any reader that wants to get a sense of the data available.

While the *CIQ* website contains a wealth of information, it is not suitable for downloading large amounts of data. For this purpose, we were directed to the Data Feed Team at *CIQ*, and our contact there has been John Schirripa, who is an expert in both the data available and the means by which researchers can obtain them. His email address is: jschirripa@capitaliq.com. You can also contact Alan Katz at akatz@capitaliq.com.

The data feed that we purchased from *CIQ* contains a series of text files that are linked. For example, one text file contains identifying information on companies, another contains information on balance sheet and income statement variables, and another has information on the detailed debt structure of firms. Once we downloaded these files, we had to link them to obtain our final data sets. In what follows, we describe the data we obtained.

B. Operating Lease Commitment Data

Operating lease commitment data come from a combination of both *CIQ* and *Compustat*. The relevant variables in *Compustat* are MRC1-MRC5, which represent "Rental Commitments Minimum 1st Year," "Rental Commitments Minimum 2nd Year," etc. and MRCTA, which represents "Thereafter Portion of Leases." For the variables MRC1-MRC5, the availability of these data for *Compustat* non-financial, U.S. based, parent firms increases gradually from about80% as of 1996 to 87% by 2008. However, the variable MRCTA is available for only 15% of the sample before 1999, at which point the availability jumps to about 80% by 2000. We are not sure why the availability for MRCTA was limited before 2000; we were unable to track down any reporting requirements or any other reason why *Compustat* has limited lease data before 2000.

We also have the identical variables from *CIQ*. For the observations for which we have the variables from both *CIQ* and *Compustat*, we find that the correlation is almost exactly one. For about 5% of our total sample, the MRC variables were missing from *Compustat* but included in *CIQ*. We use the *CIQ* leasing data in these cases. In other words, even if a researcher does not have *CIQ* data, *Compustat* is sufficient to calculate leased capital for almost 95% of our final sample.

One important issue is how to handle observations for which some of the lease commitment data are missing. If any of MRC1 through MRC4 or MRCTA is missing, we do not discount the lease commitments and so leased capital is missing. If MRC5 is missing but MRC4 and MRCTA are not missing, we set MRC5 equal to zero. We make this latter change because there appears to be a large number of observations for which MRC5 is missing but no other MRC variables are missing.

C. Debt Structure Data

The debt structure data come from *CIQ*. The specific feed from the data feed group is called the "Capital Structure Feed." It includes detailed issue-level data from financial footnotes of 10-K SEC filings of firms. The exact data collection procedure used by *CIQ* seems to be quite similar to what is done in Rauh and Sufi (2010). It appears that *CIQ* has analysts record each individual issue from the debt financial footnote, the amount, the priority (i.e., senior, unsecured, or subordinated), and the type of debt.

Using these data, we are able to break down a firm's debt into one of 13 broad categories: bank revolvers, bank term loans, revenue bonds, capital leases, commercial paper, debentures, amortized discounts, mortgage debt, notes payable, smaller notes, medium term notes, convertibles, and unclassifiable debt. Our seven broad categories are bank debt (includes revolvers and term loans), arm's length non-program debt (which includes revenue bonds, debentures, and notes payable), arm's length program debt (which includes commercial paper and medium term notes), smaller notes, convertibles, and other (which is the residual).

These categories are similar to those used by Rauh and Sufi (2010) and we are able to directly compare their debt structure data with the debt structure data in *CIQ*. There is a very high correlation. In unreported results, we have replicated the Rauh and Sufi (2010) specifications using the *CIQ* data and we find very similar results.

For other researchers interested in the debt structure data, we are very happy to provide you all necessary Stata code to build the debt structure data if you obtain the data through *CIQ*.

D. Variable Construction

The core *Compustat* variables are constructed as follows:

Unadjusted Variables	
Book Leverage Ratio Without Leases	(dltt+dlc)/at
Owned PP&E$_t$ / Book Assets$_t$	ppent/at
OIBDP$_t$ / Book Assets$_{t-1}$	oibdp/at(lagged)
Market Assets$_t$ / Book Assets$_t$	(at+prcc_f*csho-ceq-txdb)/at
ln(Sales)	Ln(sale)
New Variables	
Capitalized operating lease commitments	oplease_rd (described in data section of paper
Book Leverage Ratio With Leases	(dltt+dlc+oplease_rd)/(at+oplease_rd

Total PP&E$_t$ / (Assets + Leases)$_t$	(ppent+oplease_rd)/(at+oplease_rd)
Owned PP&E$_t$ / (Assets + Leases)$_t$	(ppent)/(at+oplease_rd)
OIBDP ex Rent$_t$ / (Assets + Leases)$_{t-1}$	(oibdp+xrent)/(at(lagged)+oplease_rd(lagged))
Market Assets$_t$ / (Book Assets + Leases)$_{t-1}$	(at+prcc_f*csho-ceq-txdb+oplease_rd)/(at+oplease_rd)

Other variables

Capital to labor ratio	(ppent+oplease_rd)/(emp*1000)
PPE in machinery	(ppegmCIQ)/(ppegtCIQ+oplease_rd)
PPE in buildings	(ppegbCIQ)/(ppegtCIQ+oplease_rd)

The last two variables come from balance sheet information from *CIQ*. They represent the gross PPE that is in machinery and buildings.

Section 2: Weighted Least Squares Estimation

Weighted least squares estimation is a specific form of generalized least squares that can improve the efficiency of estimates under certain assumptions. In our context, we have the following equation estimated via OLS:

$$Leverage_i = \alpha + \beta * \overline{Leverage}_{j,-i} + \varepsilon_i$$

where $\overline{Leverage}_{j,-i}$ is the leverage ratio of *CIQ* competitors. If there is heteroscedasticity and if there is a known variable that is a linear function of the degree of heteroscedasticity, weighted least squares with weights being the inverse square root of the known variable is a more efficient estimator than OLS. In particular, if for any i, $Var(\varepsilon_i) = \sigma_i^2$ and $\sigma_i^2 = \sigma^2 * 1/(\#\ competitors)$, then a WLS estimation where all variables are multiplied by the square root of the number of competitors is more efficient than OLS.

Appendix Figure 1 presents evidence that is suggestive of heteroscedasticity of the above form. To produce the figure, we first estimate the above equation via OLS to obtain predicted residuals. Appendix Figure 1 shows the standard deviation of the predicted residuals by the number of competitors over which $\overline{Leverage}_{j,-i}$ is calculated. As the figure shows, there is a strong negative relation between the standard deviation of the predicted residuals and the number of competitors. The pattern in Appendix Figure 1 strongly suggests heteroscedasticity, and that the heteroscedasticity is a function of the number of competitors. The WLS estimation down-weights firms that have fewer competitors to take into account the additional noise from mismeasurement.

The Stata command that we employ for WLS estimation is "regress" with [aweight = # of competitors]. Stata mechanically transforms the weight for any firm *i* to be equal to

$$w_i = \frac{n * (\#\ competitors_i)}{\sum_i^N \#competitors_i}$$

These weights then form the weighting matrix that is used to estimate WLS. The weighting matrix **D** is a diagonal matrix of size *nxn* with the diagonal elements being the weights above. As a robustness test, we replicate the Stata WLS command by multiplying all variables (including the constant) by the square root of the weights and find the exact same coefficient estimates.

In producing the R^2, the Stata command we employ calculates the following:

$$TSS = y'\boldsymbol{D}y - \{\frac{(1'y)^2}{n}\}$$

$$ESS = y'\boldsymbol{D}y - b'\boldsymbol{X}'\boldsymbol{D}y$$

$$R^2 = 1 - \frac{ESS}{TSS}$$

The main difference between the WLS and OLS R^2 calculations is the inclusion of the weighting matrix **D** in the WLS equations. One important note is that the R^2 of the WLS estimation is not comparable to the R^2 of OLS. In analyzing the results, we are careful to only compare the relative predictive power of variables within an OLS or WLS estimation, not across the estimations.

Section 3: Robustness Tests

Appendix Table I replicates the key findings of our analysis for years going back to 2004.

Appendix Table II replicates the key findings of our analysis using a credit rating specific discount rate to capitalize operating leases and 8X rental expense as a measure of the capitalized value of operating leases.

Appendix Tables III through V replicate key findings using 4 digit SIC codes instead of 3 digit SIC codes.

Section 4: Comparison with Hoberg and Phillips (2009)

We do not have access to the exact similarity scores by Hoberg and Phillips (2009). Instead, we create similarity scores using their same methodology for our sample with one important difference. Instead of extracting the full text from a firm's 10K SEC filing, we only use the short business description contained in the *Compustat* field *busdesc*. (We were unable to extract the full text from the 10K filing as in Hoberg and Phillips (2009).) Implementing the Hoberg and Phillips (2009) methodology on our sample leads to a matrix where for every firm, there is a score based on how similar the text in *busdesc* is to the text of another firm's *busdesc*.

One initial result from this exercise is that the average similarity scores from the Hoberg and Phillips (2009) methodology are much higher among *CIQ* competitors than firms in the same 3 digit SIC codes. In other words, the set of *CIQ* competitors has a higher degree of similarity in

their descriptions of their business. This is yet another piece of evidence against the use of SIC codes.

There are several ways to use the Hoberg and Phillips (2009) scores to create competitors. Hoberg and Phillips (2009) use every score that is non-zero and weight competitors by how high their score is. We tried several different procedures and chose the one that makes the Hoberg and Phillips (2009) measure as strong as possible in terms of adjusted R^2. We use only the top 25 other firms based on the similarity score, and then we weight each of these 25 by how high their score is. For any outcome, we construct the HP 25 competitor average over this outcome using the 25 firms with the highest similarity scores and weighting more heavily those with higher scores.

Appendix Table VI replicates Table II of the text, with the use of the HP 25 competitors instead of 3 digit SIC codes. Consistent with the evidence in Hoberg and Phillips (2009), the HP 25 classification of competitors does a great job on operating performance. In fact, it outperforms the *CIQ* competitors. The *CIQ* competitor measure does a better job of explaining variation in the standard deviation of operating income and sales growth.

However, HP 25 competitors do a poor job of explaining variation in capital structure of a given firm. In fact, the HP 25 competitors explain less of the variation in capital structure than even firms in the same SIC3 (see Table II). Hoberg and Phillips (2009) report this same result in their study (see in particular Table III of Hoberg and Phillips (2009)).

One potential reason is that the HP 25 competitors are less similar in terms of their asset composition. The R^2 when using the HP 25 competitors to explain variation in capital to labor ratios or the tangible assets to total assets ratio are much lower. In other words, the set of *CIQ* competitors is more similar in terms of their asset composition and capital to labor ratios than the set of HP 25 competitors. Consistent with the importance of asset similarity described in the text of our study, this is a likely channel through which *CIQ* competitors perform better in explaining capital structure than the Hoberg and Phillips (2009) methodology. It is worth emphasizing that Hoberg and Phillips (2011) use their alternative measure primarily to understand product market synergies, mergers, advertising, and R&D.

In Panel B, we examine the correlation of stock returns. The returns of the HP 25 competitors are more correlated with a given firm's stock returns than 3-digit SIC codes, but the correlation with *CIQ* competitors is even stronger. In other words, while the HP 25 competitors explain more of the variation in operating performance, the *CIQ* competitors explain more of the variation in stock returns. Both do substantially better than 3-digit SIC codes.

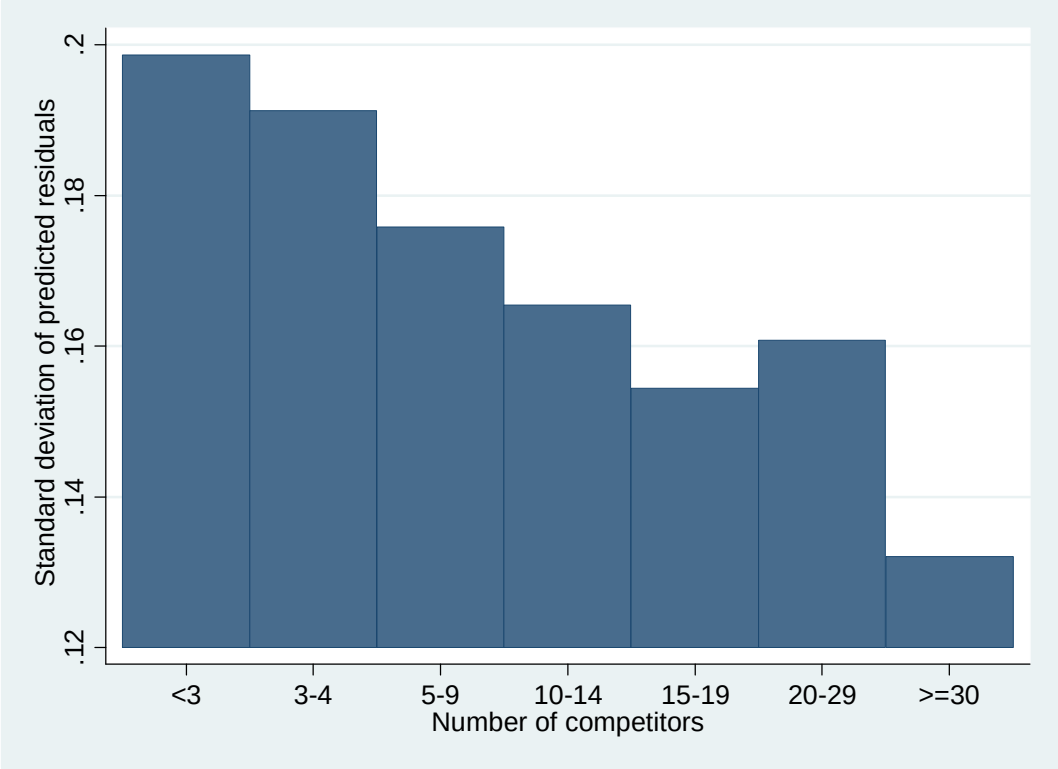
Section 5: Other Tests

Appendix Tables VII and VIII show the SIC codes of firms listed as competitors for SIC3 281 and 873. It corresponds with Figures 2 and 3 of in the text.

Appendix Figure 2 shows the adjusted R^2 for firms according to the number of product groups

Appendix Figure 1. Justifying weighted least squares

The following figure plots the standard deviation of predicted residuals from a regression of the leverage ratio with leases of a given firm on a constant and the average leverage ratio with leases of *CIQ* competitors. As the figure shows, the standard deviation of predicted residuals is much larger for firms with fewer competitors, suggesting that weighted least squares using the number of competitors as weights is more efficient than OLS. Each bin of number of competitors includes approximately 10% of the firms each.



Appendix Figure 2. Explanatory power of other group members' leverage ratio by number of product market groups in which firm operates

The following shows the adjusted R^2 from regressions of with-lease leverage ratios on the average with-lease leverage ratio of CIQ competitors, run with limits to the sample by firms operating in a certain number of product markets. Product market groups are identified as in Section 5.B. of the paper. The first point on the line limits the sample to the 1,108 observations for which firms are in only one product market group. Each successive point on the graph moving from left to right is less restrictive. The point corresponding to *n* on the X-axis limits the sample to the observations for which firms are in only *n* product markets or fewer. The right-most point on the line includes all 2,073 firms which we can attribute to product market groups.

Appendix Table I. Main cross-sectional specifications for each year 2004-2009

In the first column, the dependent variable is the *Leverage Ratio Without Leases* at book values. It follows extant literature and ignores the capitalized value of operating leases in both the numerator and denominator. The variable *Leverage Ratio With Leases* is defined as (Debt + Leases)$_t$ / (Assets + Leases)$_t$, where Leases are measured as the capitalized value of operating leases as described in the text. The third column in each panel presents WLS estimates where weights are given by the number of *CIQ* competitors. The explanatory variables follow accordingly. Robust standard errors are in parentheses. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

	2009				
	Dependent Variable: Leverage Ratio				
	no leases	*with leases*			
Leverage Ratio of Other Firms in SIC3	0.823***	0.379***	0.244**	0.220**	0.749***
	(0.034)	(0.045)	(0.059)	(0.059)	(0.042)
Leverage Ratio of CIQ Competitors		0.644***	0.807***	0.765***	
		(0.047)	(0.059)	(0.062)	
Owned PP&E$_t$ / (Assets+Leases)$_t$				0.025	0.079***
				(0.018)	(0.042)
OIBDP ex Rent$_t$ / (Assets+Leases)$_{t-1}$, 5yr mean				-0.076*	-0.053
				(0.036)	(0.037)
OIBDP ex Rent$_t$ / (Assets+Leases)$_{t-1}$, 5yr stdev				0.042	0.045
				(0.080)	(0.082)
Market Assets$_t$ / (Assets+Leases)$_t$				-0.018***	-0.019***
				(0.005)	(0.005)
ln(Sales)				0.007**	0.008**
				(0.003)	(0.003)
Constant	0.038***	-0.009	-0.010	-0.015	0.038*
	(0.008)	(0.008)	(0.011)	(0.019)	(0.020)
Observations	2543	2543	2543	2543	2543
Adjusted R-squared	0.22	0.32	0.38	0.39	0.33

	2008				
	Dependent Variable: Leverage Ratio				
	no leases	*with leases*			
Leverage Ratio of Other Firms in SIC3	0.818***	0.343***	0.168**	0.145**	0.724***
	(0.034)	(0.046)	(0.069)	(0.069)	(0.050)
Leverage Ratio of CIQ Competitors		0.654***	0.869***	0.825***	
		(0.047)	(0.067)	(0.069)	
Owned PP&E$_t$ / (Assets+Leases)$_t$				0.032	0.087***
				(0.020)	(0.021)
OIBDP ex Rent$_t$ / (Assets+Leases)$_{t-1}$, 5yr mean				-0.063*	-0.036
				(0.036)	(0.037)
OIBDP ex Rent$_t$ / (Assets+Leases)$_{t-1}$, 5yr stdev				0.069	0.084
				(0.079)	(0.081)
Market Assets$_t$ / (Assets+Leases)$_t$				-0.019***	-0.020***
				(0.006)	(0.006)
ln(Sales)				0.006**	0.007**
				(0.003)	(0.003)
Constant	0.042***	-0.002	-0.007	-0.011	0.049**
	(0.008)	(0.009)	(0.013)	(0.021)	(0.022)
Observations	2575	2575	2575	2575	2575
Adjusted R-squared	0.21	0.30	0.35	0.36	0.29

	2007				
	Dependent Variable: Leverage Ratio				
	no leases	*with leases*			
Leverage Ratio of Other Firms in SIC3	0.774***	0.379***	0.244***	0.208***	0.7***
	(0.035)	(0.043)	(0.064)	(0.063)	(0.049)
Leverage Ratio of CIQ Competitors		0.623***	0.779***	0.748***	
		(0.045)	(0.065)	(0.065)	
Owned $PP\&E_t$ / $(Assets+Leases)_t$				0.01	0.048***
				(0.017)	(0.017)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean				-0.05	-0.048
				(0.032)	(0.033)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr stdev				-0.048	-0.053
				(0.059)	(0.060)
Market $Assets_t$ / $(Assets+Leases)_t$				-0.019***	-0.02***
				(0.003)	(0.004)
ln(Sales)				0.003	0.005*
				(0.002)	(0.003)
Constant	0.046***	-0.004	-0.003	0.035*	0.091***
	(0.008)	(0.009)	(0.013)	(0.020)	(0.020)
Observations	2762	2762	2762	2762	2762
Adjusted R-squared	0.16	0.27	0.31	0.33	0.27

	2006				
	Dependent Variable: Leverage Ratio				
	no leases	*with leases*			
Leverage Ratio of Other Firms in SIC3	0.843***	0.418***	0.257***	0.236***	0.741***
	(0.035)	(0.046)	(0.069)	(0.067)	(0.049)
Leverage Ratio of CIQ Competitors		0.588***	0.779***	0.748***	
		(0.048)	(0.065)	(0.064)	
Owned $PP\&E_t$ / $(Assets+Leases)_t$				-0.002	0.046**
				(0.018)	(0.019)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean				-0.059*	-0.063**
				(0.031)	(0.032)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr stdev				-0.046	-0.08
				(0.066)	(0.067)
Market $Assets_t$ / $(Assets+Leases)_t$				-0.02***	-0.021***
				(0.003)	(0.004)
ln(Sales)				0.002	0.004
				(0.002)	(0.003)
Constant	0.031***	-0.002	-0.009	0.041**	0.089***
	(0.007)	(0.009)	(0.011)	(0.019)	(0.019)
Observations	2808	2808	2808	2808	2808
Adjusted R-squared	0.19	0.27	0.33	0.35	0.29

	2005				
	Dependent Variable: Leverage Ratio				
	no leases	*with leases*			
Leverage Ratio of Other Firms in SIC3	0.8***	0.425***	0.258***	0.244***	0.74***
	(0.034)	(0.044)	(0.056)	(0.054)	(0.043)
Leverage Ratio of CIQ Competitors		0.544***	0.764***	0.725***	
		(0.047)	(0.057)	(0.058)	
Owned $PP\&E_t$ / $(Assets+Leases)_t$				-0.001	0.04**
				(0.017)	(0.018)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean				-0.085***	-0.094***
				(0.031)	(0.032)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr stdev				-0.117*	-0.185***
				(0.067)	(0.071)
Market $Assets_t$ / $(Assets+Leases)_t$				-0.018***	-0.019***
				(0.003)	(0.003)
ln(Sales)				0	0.001
				(0.002)	(0.002)
Constant	0.038***	0.009	-0.004	0.063***	0.114***
	(0.007)	(0.009)	(0.011)	(0.019)	(0.020)
Observations	2820	2820	2820	2820	2820
Adjusted R-squared	0.17	0.25	0.33	0.35	0.29

	2004				
	Dependent Variable: Leverage Ratio				
	no leases	*with leases*			
Leverage Ratio of Other Firms in SIC3	0.811***	0.400***	0.284***	0.253***	0.721***
	(0.032)	(0.044)	(0.057)	(0.055)	(0.044)
Leverage Ratio of CIQ Competitors		0.571***	0.746***	0.697***	
		(0.046)	(0.057)	(0.058)	
Owned $PP\&E_t$ / $(Assets+Leases)_t$				-0.002	0.046**
				(0.018)	(0.018)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean				-0.07**	-0.083***
				(0.029)	(0.030)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr stdev				-0.076	-0.16***
				(0.054)	(0.056)
Market $Assets_t$ / $(Assets+Leases)_t$				-0.023***	-0.023***
				(0.003)	(0.003)
ln(Sales)				0.001	0.001
				(0.002)	(0.002)
Constant	0.033***	0.006	-0.007	0.066***	0.122***
	(0.007)	(0.008)	(0.011)	(0.020)	(0.020)
Observations	2838	2838	2838	2838	2838
Adjusted R-squared	0.19	0.26	0.34	0.37	0.32

Appendix Table II. Alternative measures of capitalized operating leases

This table replicates the last three columns of Table 3 using alternative methods for capitalizing operating leases. The first three columns use 8X rental expense as a measure of capitalized operating leases. The second three columns use a credit-rating specific discount rate to discount operating lease commitments. Robust standard errors are in parentheses. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

	Dependent Variable					
	Leverage Ratio using 8X rental expense for leases			*Leverage Ratio using credit-rating specific discount rate for leases*		
Leverage Ratio of	0.832***		0.401***	0.844***		0.394 ***
Other Firms in SIC3	(0.029)		(0.044)	(0.031)		(0.045)
Leverage Ratio of		0.912***	0.612***		0.911***	0.625 ***
CIQ Competitors		(0.030)	(0.046)		(0.032)	(0.047)
Constant	0.056***	0.025***	-0.004	0.043***	0.014	-0.009
	(0.009)	(0.010)	(0.009)	(0.008)	(0.008)	(0.008)
Method	OLS	OLS	OLS	OLS	OLS	OLS
Weights	—	—	—	—	—	—
Observations	2687	2687	2687	2687	2687	2687
Adjusted R-squared	0.25	0.28	0.31	0.24	0.28	0.30

Appendix Table III. Leverage ratios, industry groups and competitor groups, using SIC4

This table is the same as Table 3 of the paper except that it uses SIC4 as the benchmark. In the left panel, the dependent variable is the *Leverage Ratio Without Leases* at book values. It follows extant literature and ignores the capitalized value of operating leases in both the numerator and denominator. The variable *Leverage Ratio With Leases* is defined as $(\text{Debt} + \text{Leases})_t / (\text{Assets} + \text{Leases})_t$, where Leases are measured as the capitalized value of operating leases as described in the text. Robust standard errors are in parentheses. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

	Dependent Variable					
	Leverage Ratio Without Leases			*Leverage Ratio With Leases*		
Leverage Ratio of	0.772***		0.393***	0.786***		0.366 ***
Other Firms in SIC4	(0.031)		(0.041)	(0.028)		(0.041)
Leverage Ratio of		0.888***	0.602***		0.922***	0.633 ***
CIQ Competitors		(0.034)	(0.048)		(0.030)	(0.046)
Constant	0.048***	0.009	-0.006	0.059***	0.013	-0.003
	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
Method	OLS	OLS	OLS	OLS	OLS	OLS
Weights	—	—	—	—	—	—
Observations	2663	2663	2663	2663	2663	2663
Adjusted R-squared	0.22	0.25	0.28	0.26	0.29	0.32

Appendix Table IV. Incremental explanatory power of competitor leverage over traditional determinants, with SIC4 and owned PP&E

This table is the same as Table 4 of the paper except that it uses SIC4 as the benchmark. The first four columns show Ordinary Least Squares (OLS) estimates. The second four columns show weighted least squares (WLS) estimates, where the weights are the number of *CIQ* competitors. The Property Plant and Equipment variable is Owned PP&E, which is the unadjusted figure that appears on the balance sheet. Robust standard errors are in parentheses. OIBDP is Operating Income Before Depreciation. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

	Dependent Variable: Leverage Ratio with Leases							
	Ordinary Least Squares Estimates				*Weighted by* CIQ *Number of Competitors*			
Leverage Ratio with Leases of *CIQ* Competitors	0.933***	0.799***	0.580***		1.016***	0.944***	0.763***	
	(0.030)	(0.035)	(0.047)		(0.034)	(0.041)	(0.059)	
Leverage Ratio with Leases of Other Firms in SIC4			0.299***	0.637***			0.208***	0.681***
			(0.040)	(0.032)			(0.049)	(0.038)
Owned $PP\&E_t$ / $(Assets+Leases)_t$		0.075***	0.059***	0.108***		0.032*	0.029	0.092***
		(0.018)	(0.018)	(0.018)		(0.018)	(0.018)	(0.018)
Market $Assets_t$ / $(Assets+Leases)_t$		-0.015***	-0.014***	-0.015***		-0.019***	-0.018***	-0.018***
		(0.003)	(0.003)	(0.003)		(0.005)	(0.005)	(0.005)
ln(Sales)		0.014***	0.013***	0.016***		0.007***	0.007**	0.007**
		(0.002)	(0.002)	(0.002)		(0.003)	(0.003)	(0.003)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean		-0.118***	-0.116***	-0.118***		-0.075**	-0.071**	-0.039
		(0.025)	(0.025)	(0.024)		(0.036)	(0.036)	(0.036)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr stdev		-0.088	-0.067	-0.078		0.017	0.035	0.020
		(0.054)	(0.053)	(0.054)		(0.080)	(0.080)	(0.082)
Constant	0.010	-0.014	-0.027**	0.004	-0.004	-0.003	-0.009	0.058***
	(0.008)	(0.016)	(0.016)	(0.016)	(0.010)	(0.019)	(0.019)	(0.021)
Observations	2519	2519	2519	2519	2519	2519	2519	2519
Adjusted R-squared	0.30	0.34	0.35	0.30	0.37	0.39	0.40	0.33

Appendix Table V. Incremental explanatory power of competitor leverage over traditional determinants, with SIC4 and total PP&E

This table is the same as Table 5 of the paper except that it uses SIC4 as the benchmark. The first four columns show Ordinary Least Squares (OLS) estimates. The second four columns show weighted least squares (WLS) estimates, where the weights are the number of *CIQ* competitors. The Property Plant and Equipment variable is Total PP&E, which is the unadjusted figure that appears on the balance sheet plus the capitalized value of operating leases. Robust standard errors are in parentheses. OIBDP is Operating Income Before Depreciation. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

	Dependent Variable: Leverage Ratio with Leases							
	Ordinary Least Squares Estimates				*Weighted by* CIQ *Number of Competitors*			
Leverage Ratio with Leases of *CIQ* Competitors	0.933***	0.600***	0.459***		1.016***	0.755***	0.632***	
	(0.030)	(0.039)	(0.047)		(0.034)	(0.048)	(0.060)	
Leverage Ratio with Leases of Other Firms in SIC4			0.213***	0.453***			0.156**	0.493***
			(0.040)	(0.035)			(0.048)	(0.042)
Total $PP\&E_t$ / $(Assets+Leases)_t$		0.226***	0.199***	0.259***		0.145***	0.135***	0.214***
		(0.019)	(0.020)	(0.019)		(0.021)	(0.021)	(0.020)
Market $Assets_t$ / $(Assets+Leases)_t$		-0.014***	-0.013***	-0.014***		-0.014***	-0.014***	-0.015***
		(0.003)	(0.003)	(0.003)		(0.004)	(0.004)	(0.004)
ln(Sales)		0.014***	0.014***	0.016***		0.008***	0.008***	0.009***
		(0.002)	(0.002)	(0.002)		(0.003)	(0.003)	(0.003)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean		-0.147***	-0.144***	-0.149***		-0.107***	-0.102***	-0.098***
		(0.024)	(0.024)	(0.023)		(0.035)	(0.035)	(0.035)
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr stdev		-0.117**	-0.101*	-0.109**		-0.055	-0.037	-0.060
		(0.052)	(0.052)	(0.053)		(0.079)	(0.079)	(0.080)
Constant	0.010	-0.016	-0.025*	0.010	-0.004	-0.003	-0.007	0.046**
	(0.008)	(0.015)	(0.015)	(0.014)	(0.010)	(0.019)	(0.019)	(0.020)
Observations	2519	2519	2519	2519	2519	2519	2519	2519
Adjusted R-squared	0.30	0.38	0.39	0.36	0.37	0.41	0.41	0.37

Appendix Table VI. CIQ competitors and Hoberg-Phillips similarity scores

Each row of Panel A shows the adjusted R-squared for three regressions: a regression of the characteristic on the average characteristic of other firms with the top 25 similarity scores based on an algorithm from Hoberg and Phillips (2010) using the short business description field in *Compustat*, a regression of the characteristic on the average characteristic of at *CIQ* competitors, and a regression of the characteristic on both. Panel B presents regressions of monthly stock returns for a given firm on the value-weighted market return and the equal-weighted portfolio return of other HP25 and *CIQ* competitors. The estimation period for Panel B is 2003 through 2008 and standard errors are clustered by year. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Panel A: Adjusted R-Squared in Regression of Characteristic on Average of Other Group Members, 2008

	Hoberg-Phillips 25	*CIQ* Competitors	HP25 & *CIQ* Competitors
$OIBDP_t$ / Book $Assets_{t-1}$	0.266	0.230	0.308
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$	0.273	0.239	0.316
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5yr mean	0.325	0.301	0.384
OIBDP ex $Rent_t$ / $(Assets+Leases)_{t-1}$, 5year stdev	0.110	0.123	0.191
$OIBDP_t$ / $Sales_t$	0.273	0.200	0.304
OIBDP ex $Rent_t$ / $Sales_t$	0.273	0.208	0.308
Sales $Growth_t$	0.102	0.144	0.143
Leverage ratio without $leases_t$	0.175	0.246	0.253
Leverage ratio with $leases_t$	0.208	0.287	0.295
Market to book $ratio_t$	0.106	0.114	0.126
Total $PP\&E_t$ / $(Assets+Leases)_t$	0.522	0.669	0.682
Owned $PP\&E_t$ / $(Assets+Leases)_t$	0.541	0.679	0.688
Capital / $Labor_t$	0.634	0.766	0.769
ln($Sales_t$)	0.234	0.153	0.257

Panel B: Monthly Return Regressions

	Dependent variable: return of firm i in month t					
	(1)	(2)	(3)	(4)	(5)	(6)
Value-weighted market $return_t$	0.634***	0.890***	0.467***	0.230***	0.694***	0.152***
	(0.092)	(0.223)	(0.120)	(0.030)	(0.202)	(0.049)
Portfolio return *CIQ* $Competitors_{it}$	0.546***		0.483***	0.809***		0.725***
	(0.024)		(0.034)	(0.013)		(0.035)
Portfolio return of firms in $HP25_{it}$		0.328***	0.187**		0.410***	0.142**
		(0.126)	(0.078)		(0.144)	(0.065)
Constant	0.185	0.206	0.129	0.067	0.166	0.029
	(0.195)	(0.229)	(0.153)	(0.051)	(0.152)	(0.031)
Weighted?		No		Yes, by number of CIQ competitors		
Observations	144184	144184	144184	143482	143482	143482
Adjusted R-squared	0.12	0.09	0.12	0.19	0.14	0.20

Appendix Table VII. Companies In The Competitor Network of SIC3 = 281

	Company Name	SIC3
1	MONSANTO CO	10
2	MARTIN MARIETTA MATERIALS	140
3	ALPHA PRO TECH LTD	230
4	MASCO CORP	243
5	MEADWESTVACO CORP	263
6	3M CO	267
7	LYDALL INC	267
8	ROCKWOOD HOLDINGS INC	280
9	ARCH CHEMICALS INC	280
10	USEC INC	281
11	INNOSPEC INC	281
12	AIR PRODUCTS & CHEMICALS INC	281
13	TOR MINERALS INTL INC	281
14	CALGON CARBON CORP	281
15	CLEAN DIESEL TECHNOLOGIES	281
16	LSB INDUSTRIES INC	281
17	KRONOS WORLDWIDE INC	281
18	ATMI INC	281
19	PRAXAIR INC	281
20	OLIN CORP	281
21	VALHI INC	281
22	MINERALS TECHNOLOGIES INC	281
23	ACORN ENERGY INC	281
24	GRACE (W R) & CO	281
25	AMERICAN PACIFIC CORP	281
26	INNOPHOS HOLDINGS INC	281
27	GEORGIA GULF CORP	281
28	CHEMTURA CORPORATION	282
29	POLYONE CORP	282
30	SCHULMAN (A.) INC	282
31	OMNOVA SOLUTIONS INC	282
32	DOW CHEMICAL	282
33	EASTMAN CHEMICAL CO	282
34	DU PONT (E I) DE NEMOURS	282
35	SIGMA-ALDRICH CORP	283
36	CAMBREX CORP	283
37	STEPAN CO	284
38	ECOLAB INC	284
39	VALSPAR CORP	285
40	FERRO CORP	285
41	PPG INDUSTRIES INC	285
42	HUNTSMAN CORP	286
43	WESTLAKE CHEMICAL CORP	286
44	KMG CHEMICALS INC	286
45	NEWMARKET CORP	286
46	INTL FLAVORS & FRAGRANCES	286

47	CELANESE CORP	286
48	CF INDUSTRIES HOLDINGS INC	287
49	MOSAIC CO	287
50	TERRA INDUSTRIES INC	287
51	CABOT CORP	289
52	FULLER (H. B.) CO	289
53	ALBEMARLE CORP	289
54	CYTEC INDUSTRIES INC	289
55	ADA-ES INC	289
56	LUBRIZOL CORP	299
57	QUAKER CHEMICAL CORP	299
58	ENPRO INDUSTRIES INC	305
59	SPARTECH CORP	308
60	ENTEGRIS INC	308
61	CONTINENTAL MATERIALS CORP	327
62	EAGLE MATERIALS INC	327
63	BRUSH ENGINEERED MATERIALS	333
64	OM GROUP INC	334
65	ALCOA INC	335
66	SIMPSON MANUFACTURING INC	342
67	CHART INDUSTRIES INC	344
68	ROBBINS & MYERS INC	344
69	ALLIANT TECHSYSTEMS INC	348
70	CIRCOR INTL INC	349
71	COLUMBUS MCKINNON CORP	353
72	EXTERRAN HOLDINGS INC	353
73	KAYDON CORP	356
74	FLANDERS CORP	356
75	PALL CORP	356
76	CLARCOR INC	356
77	DONALDSON CO INC	356
78	GORMAN-RUPP CO	356
79	HEWLETT-PACKARD CO	357
80	EMC CORP/MA	357
81	MESTEK INC	358
82	AAON INC	358
83	PLUG POWER INC	362
84	INTEL CORP	367
85	FUELCELL ENERGY INC	369
86	FORD MOTOR CO	371
87	TEXTRON INC	372
88	UNITED TECHNOLOGIES CORP	372
89	HONEYWELL INTERNATIONAL INC	372
90	THERMO FISHER SCIENTIFIC INC	382
91	WATERS CORP	382
92	EASTMAN KODAK CO	386
93	BARNES GROUP INC	473
94	AMERICAN ELECTRIC POWER CO	491
95	WASTE MANAGEMENT INC	495
96	ENERGYSOLUTIONS INC	495

97	CASELLA WASTE SYS INC -CL A	495
98	AMERICAN ECOLOGY CORP	495
99	REPUBLIC SERVICES INC	495
100	PERMA-FIX ENVIRONMENTAL SVCS	495
101	STERICYCLE INC	495
102	WASTE SERVICES INC	495
103	WASTE CONNECTIONS INC	495
104	CLEAN HARBORS INC	495
105	COVANTA HOLDING CORP	499
106	AIRGAS INC	508
107	WALGREEN CO	591
108	AUTODESK INC	737
109	MICROSOFT CORP	737
110	INTL BUSINESS MACHINES CORP	737
111	LINCARE HOLDINGS INC	809
112	LAYNE CHRISTENSEN CO	871
113	GENERAL ELECTRIC CO	999

Appendix Table VIII. Companies In The Competitor Network of SIC3 = 873

	Company Name	SIC3
1	DU PONT (E I) DE NEMOURS	282
2	SOLUTIA INC	282
3	DOW CHEMICAL	282
4	KING PHARMACEUTICALS INC	283
5	LIFE TECHNOLOGIES CORP	283
6	BIOMARIN PHARMACEUTICAL INC	283
7	CUBIST PHARMACEUTICALS INC	283
8	IMMUNOGEN INC	283
9	VIVUS INC	283
10	VERTEX PHARMACEUTICALS INC	283
11	AUXILIUM PHARMA INC	283
12	AFFYMAX INC	283
13	ZYMOGENETICS INC	283
14	SANTARUS INC	283
15	REGENERON PHARMACEUT	283
16	MEDICINES CO	283
17	LILLY (ELI) & CO	283
18	TECHNE CORP	283
19	QUIDEL CORP	283
20	VAXGEN INC	283
21	SIGMA-ALDRICH CORP	283
22	JOHNSON & JOHNSON	283
23	GEN-PROBE INC	283
24	PFIZER INC	283
25	GENOMIC HEALTH INC	283
26	NEKTAR THERAPEUTICS	283
27	OSI PHARMACEUTICALS INC	283
28	PROGENICS PHARMACEUTICAL INC	283
29	ALKERMES INC	283
30	ALEXION PHARMACEUTICALS INC	283
31	IDENIX PHARMACEUTICALS INC	283
32	ISIS PHARMACEUTICALS INC	283
33	SERACARE LIFE SCIENCES INC	283
34	AMGEN INC	283
35	ABBOTT LABORATORIES	283
36	NANOSPHERE INC	283
37	PROCTER & GAMBLE CO	284
38	INTL FLAVORS & FRAGRANCES	286
39	RENTECH INC	287
40	CONOCOPHILLIPS	291
41	EXXON MOBIL CORP	291
42	CHEVRON CORP	291
43	WEST PHARMACEUTICAL SVSC INC	306
44	PALL CORP	356
45	AMERICAN SUPERCONDUCTOR CP	362
46	JDS UNIPHASE CORP	366
47	FIRST SOLAR INC	367

48	OPNEXT INC	367
49	COMBIMATRIX CORP	367
50	OCLARO INC	367
51	RAYTHEON CO	381
52	NORTHROP GRUMMAN CORP	381
53	STRATEGIC DIAGNOSTICS INC	382
54	MILLIPORE CORP	382
55	BECKMAN COULTER INC	382
56	SEQUENOM INC	382
57	CEPHEID INC	382
58	ILLUMINA INC	382
59	BIO-RAD LABORATORIES INC	382
60	WATERS CORP	382
61	LUMINEX CORP	382
62	THERMO FISHER SCIENTIFIC INC	382
63	PERKINELMER INC	382
64	CALIPER LIFE SCIENCES INC	382
65	AGILENT TECHNOLOGIES INC	382
66	HOLOGIC INC	384
67	AFFYMETRIX INC	384
68	BECTON DICKINSON & CO	384
69	ABAXIS INC	384
70	AMERISOURCEBERGEN CORP	512
71	INVENTIV HEALTH INC	512
72	CARDINAL HEALTH INC	512
73	OMNICARE INC	591
74	KELLY SERVICES INC -CL A	736
75	CDI CORP	736
76	CROSS COUNTRY HEALTHCARE INC	736
77	RCM TECHNOLOGIES INC	736
78	KFORCE INC	736
79	ROBERT HALF INTL INC	736
80	MANPOWER INC/WI	736
81	ERESEARCHTECHNOLOGY INC	737
82	TECHTEAM GLOBAL INC	737
83	SYMYX TECHNOLOGIES INC	737
84	LABORATORY CP OF AMER HLDGS	807
85	QUEST DIAGNOSTICS INC	807
86	HEALTHWAYS INC	809
87	IMS HEALTH INC	870
88	CHARLES RIVER LABS INTL INC	873
89	CELERA CORP	873
90	COVANCE INC	873
91	PHARMACEUTICAL PROD DEV INC	873
92	SENOMYX INC	873
93	ENCORIUM GROUP INC	873
94	KENDLE INTERNATIONAL INC	873
95	NATIONAL TECHNICAL SYS INC	873
96	SUPERCONDUCTOR TECHNOLOGIES	873
97	METABOLIX INC	873

98	SYNTROLEUM CORP	873
99	BIOANALYTICAL SYSTEMS INC	873
100	ALBANY MOLECULAR RESH INC	873
101	MAXYGEN INC	873
102	DAYSTAR TECHNOLOGIES INC	873
103	PAREXEL INTERNATIONAL CORP	873
104	COMFORCE CORP	874