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Risk Disclosure in SEC Corporate Filings

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WH-299-301

22 April 2011

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Abstract

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Introduction

In the United States, public companies must submit Form 10-K to the Securities and Exchanges Commission (SEC) annually. Though investors often use the 10-K form to access a firm's four financial statements, it also gives a summary of a company's performance as well as

supplementary qualitative and quantitative statements about the firm's condition, such as the company's history, organizational structure, and executive compensation.

Beginning in 2005, the SEC required a new section in annual 10-K reports, section 1A, in which firms are required to discuss the "most significant factors that make the company speculative or risky"[1]. As with other disclosures and financial information, firms are required to update these disclosures quarterly if they change from the previous annual filing. The SEC also provides guidelines for organizing the section as well as examples of relevant risk factors, such as:

- Lack of an operating history
- Lack of profitable operations in recent periods
- Financial position
- Business or proposed business
- Lack of a market for […] common equity securities or securities convertible into or exercisable for common equity securities

Criticism of the SEC's disclosure requirements centers around two main arguments. First, since disclosures can be purely qualitative, firms do not have to estimate the economic effect of a disclosed risk on the firm's financial performance, thus making it difficult for investors to incorporate their content into their decisions. Second, firms do not have to quantify the likelihood that a disclosed risk will ultimately affect the company, so managers could disclose all possible risks and uncertainties rather than focusing on the risks that are relevant to their firm, resulting in information that is of little utility to investors and the public. In response, managers

[1] Regulation S-K, Item 305(c), SEC 2005

might argue that estimating such likelihoods would be difficult even with inside information, and such disclosures could require firms to disclose proprietary information[2].

In 2010, because of these criticisms, the SEC revised its guidelines to instruct firms not to "present risks that could apply to any issuer or any offering," but judging the effectiveness of this revision will require both time (for firms to file 10-K forms under the revised guidelines) and detailed analysis (to identify the effect, if any, of the revision)[3].

This goal of this project is to explore the content of the "Risk Factors" section (item 1A) of the form 10-K. We are interested in determining whether the textual content of the risk disclosure has any relationship with the firm's performance.

Investigating the content of risk disclosures is important to investors as well as regulators. First, since item 1A is over 10 percent of the form 10-K (on average)[4], identifying the effectiveness of the disclosures is essential to ensure transparent yet efficient reporting. In addition, identifying specific weaknesses can ensure that the disclosure guidelines are useful for firms across industries, sizes, etc. Second, following the recent financial crisis, the SEC has increased its focus on more effective risk factor disclosures. In fact, the SEC identified "inadequate disclosure issues" as the most frequent issue in its comment letters about U.S. companies' annual and quarterly filings dated between January 2009 and July 2010.

To date, we could identify only one other study that has investigated item 1A disclosures, by looking at the impact of the length of risk factor disclosures and type of risk (idiosyncratic, systematic, financial, tax, litigation)[5]. As such, it is important to understand both the accuracy of

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[2] Campbell, John L. et al. "The Information Content of Mandatory Risk Factor Disclosures in Corporate Filings." *SSRN eLibrary* (2010): 10 May 2011.
[33] Johnson, Sarah. "SEC Pushes Companies for More Risk Information." *CFO* 2 Aug 2010. 10 May 2011.
[4] Campbell, John L. et al. "The Information Content of Mandatory Risk Factor Disclosures in Corporate Filings." *SSRN eLibrary* (2010): 10 May 2011.
[5] Ibid.

the disclosures as well as identify whether and how investors and the market utilize these disclosures. Moreover, correlating the risks with accounting data as we do could provide evidence either for or against the utility of the risk disclosures.

Methodology

Specifically, our investigation consisted of three stages. First, we developed a basic categorization of the risk factors that firms outline in item 1A of the 10-K. Since many firms identify common risk factors (for example, competition or supply disruptions), this allowed us to identify the commonalities among firms. We did this for a simple random sample of 122 firms. (The random sample was generated using the firms in the COMPUSTAT database, and 10-K filings are publicly available on the SEC's website. Because of variability in firms' fiscal years end dates, we considered the documents submitted in 2009, either for fiscal years ending at the end of 2008 or midway through the 2009 calendar year. For a list of firms used, see Appendix I.) Initially, as the risk factors can be lengthy, we categorized each risk in one of 116 relatively specific categories. Examples of categories included general risk factors such as "competition" as well as very specific factors such as foreign supply chains. A complete list of the initial categories is included in Appendix II.

To provide more meaningful and statistically predictive categories, we next consolidated the risk factor categories into the following smaller list of 29 categories:

accounting	international
acquisitions	inventory
calamities	investments
capital expenditures	key personnel
capital structure	labor
cash	legal
competition	macro
contracts	marketing
credit risk	operations
customer concentration	regional
distribution	solvency
government	stock price
industry	suppliers
insurance	takeovers
intellectual property	

Table 1

For each company, the consolidated category was simply the logical disjunction of each of the categories of which it was composed. The combination of categories that gave the consolidated category list is provided in Appendix III. We used this list of 29 categories for all further analyses.

Second, after categorizing the risk disclosures for each of the 122 selected firms, we computed descriptive statistics on the various categories. Our goal was to note categories that are nearly ubiquitous to help identify the disclosures that are essentially “boilerplate” (used repetitively across most of the filings) and reveal which disclosures are likely to provide relevant information specific to an individual firm. We also evaluated differences in risk factors across industries (as grouped by the first digit or first two digits of a company’s SIC code) with the intention of determining whether a firm’s industry is the primary driver of its risk factor disclosures.

Finally, we investigated relationships between various accounting measures of the firm and the related risk categorizations using regression; we were looking for any operating risk

factors or the total number of risk factors to influence metrics such as leverage, capital expenditures, cash, or acquisitions.

Results

After completing the categorization, we first calculated basic statistics for each consolidated risk category, such as the total number of companies that mentioned a risk in that category ("sum"), as well as the average number of companies that mentioned that category ("mean") and its respective standard deviation:

Category	Sum	Mean	SD	Category	Sum	Mean	SD	Category	Sum	Mean	SD
accounting	38	0.31	0.47	distribution	24	0.20	0.40	legal	69	0.57	0.50
acquisitions	74	0.61	0.49	government	104	0.85	0.36	macro	91	0.75	0.44
calamities	29	0.24	0.43	industry	26	0.21	0.41	marketing	40	0.33	0.47
capital expenditures	14	0.11	0.32	insurance	25	0.20	0.41	operations	76	0.62	0.49
capital structure	88	0.72	0.45	intellectual property	56	0.46	0.50	regional	4	0.03	0.18
cash	16	0.13	0.34	international	59	0.48	0.50	solvency	37	0.30	0.46
competition	101	0.83	0.38	inventory	13	0.11	0.31	stock price	77	0.63	0.48
contracts	41	0.34	0.47	investments	23	0.19	0.39	suppliers	71	0.58	0.50
credit risk	17	0.14	0.35	key personnel	85	0.70	0.46	takeovers	42	0.34	0.48
customer concentration	40	0.33	0.47	labor	12	0.10	0.30				

Table 2

In the table above, the five most common categories are highlighted in yellow. As we expected, "macro" factors, such as global recessions, the financial crisis of 2007 and 2008, or inflation were very frequent. In addition, as expected, risks related to capital structure, such as too much leverage or an inability to make interest payments, were also frequent. Surprisingly, we found that cash or liquidity was not a very common risk factor, which could indicate that the firms in our sample seemed to feel comfortable enough with their short-term lending arrangements that they would not list cash availability as a major risk.

For a graphical presentation of the material in Table 1, see Appendix IV. In looking at a bar chart, we did notice one significant fact in the data. There do seem to be "clusters" of a few

of the categories, such as government and competition, or macro, capital structure, and key personnel. In addition, we noticed a sharper reduction in frequency after intellectual property, with the remaining risks being almost one-third less frequent.

We also evaluated correlations between consolidated risk factor categories to identify categories that should either be excluded. We first generated a complete correlation matrix, and color-coded cells with a gradient from -1 to 1 to identify strong correlations. (This table is provided in Appendix V.) We did not notice any correlation strong enough that the categories needed to be merged. Overall, we did notice that the categories showed some slight positive correlation around 0.1, as visible in the figure below:

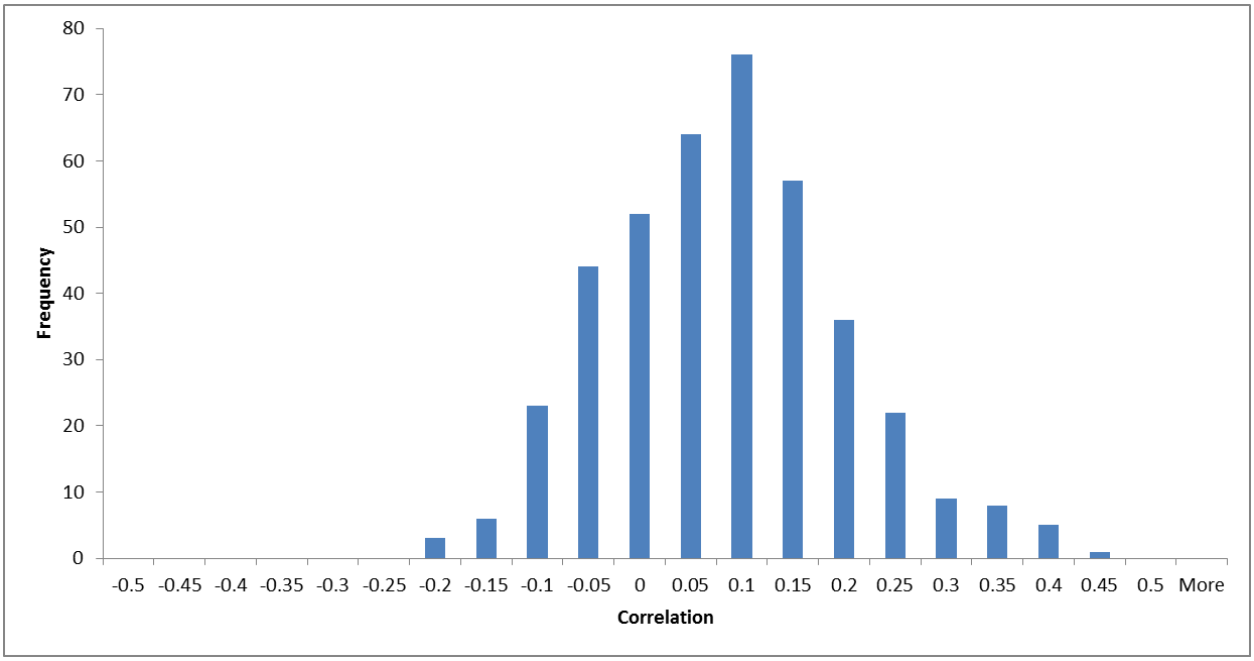


Figure 1

Also, as visible in the histogram in Figure 1, there were no correlations above 0.5, and few above 0.4, giving us confidence that our categorizations were independent when conducting statistical analysis and regression analysis.

We next investigated the presence of differences in risk factor disclosures across industries. We first defined "industries" as companies with the same first digit of their SIC code, and computed means for each of them; the values for each industry and category are presented in Appendix VI. As we hypothesized, when glancing only at the mean values numerically, the values seemed to differ across industries, with "international" risk and intellectual property risk being prime examples.

However, when we tested the means for differences, we found very little significance. For our statistical tests, we tried grouping firms by both the first digit and the first two-digits of their SIC code, and for each consolidated risk category, we used a Kruskal-Wallis test to identify industries that stood out, essentially providing a non-parametric analysis of variance with firms grouped by industry. Our null hypothesis was that the means were equal (i.e. $\mu_{1000} = \mu_{2000} = \mu_{3000} = \cdots = \mu_{8000}$), and our alternative hypothesis was that at least one of the industries had a different mean than the rest. Our results (in the form of p-values) are summarized below:

	SIC 1-digit P-value	SIC 2-digit P-value		SIC 1-digit P-value	SIC 2-digit P-value
accounting	0.102	0.705	insurance	0.243	0.020
acquisitions	0.276	0.280	international	0.000	0.011
marketing	0.488	0.697	intellectual property	0.010	0.002
capital strucutre	0.608	0.610	key personnel	0.666	0.237
capital expenditures	0.422	0.609	legal	0.926	0.740
cash	0.756	0.992	solvency	0.542	0.559
takeovers	0.293	0.690	calamities	0.296	0.824
competition	0.742	0.433	investments	0.379	0.407
credit risk	0.698	0.529	operations	0.155	0.011
customer concentration	0.821	0.567	regional	0.199	0.001
inventory	0.259	0.831	stock price	0.238	0.024
distribution	0.721	0.674	contracts	0.702	0.196
government	0.074	0.011	suppliers	0.000	0.003
industry	0.142	0.024	labor	0.182	0.054
macro	0.385	0.642			

Table 3

In table 3, the most significant tests are highlighted in red, and demonstrated $p < \frac{0.05}{29} \approx 0.002$. (We divided by 29 to provide a Bonferroni correction for multiple testing.) In addition, we

highlighted in yellow those tests with $p < 0.01$ and in green those with $p < 0.05$. Even with these generous cutoffs, however, very few tests seemed significant.

As an alternative approach, we attempted to use principal component analysis to see if industry classification was a major driver of variation in our risk categorizations. Principal component analysis "rotates" the dataset such that the maximum variance is captured by the first few principal components, allowing us to reduce the dimensionality of the data. We considered the first two principal components for each company, and grouped companies by the first digit of their SIC code to identify any potential clustering:

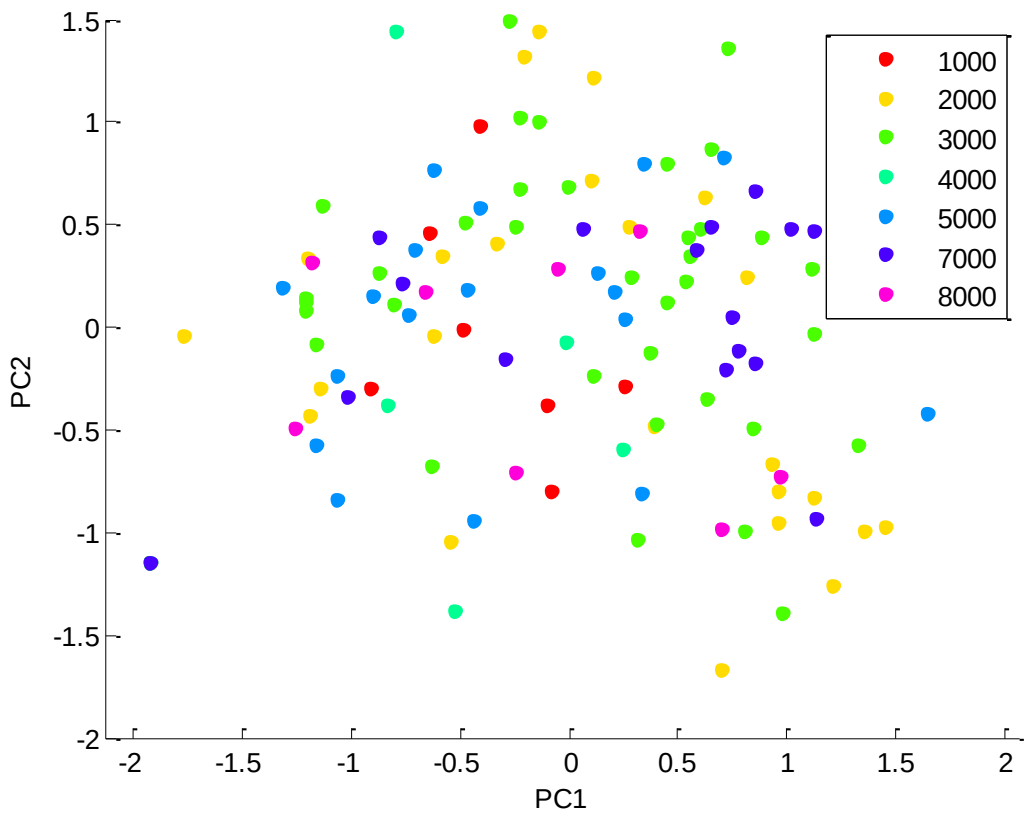


Figure 2

As visible in the figure above, we did not see any clustering in the data based on the SIC code, indicating that for at least the first two principal components of the data, industry classification is

not a major source of variance. We saw similar results for the third and fourth principal components as well (figure not shown).

There are a few potential explanations for the results we have seen regarding the relationship between industry and risk disclosures. One possibility is that disclosures are firm-specific and that firms distinguish their disclosures other firms in the same industry; thus, the fact that industry is not a major driver of variation is a positive aspect because it means that each firm provides information in its disclosure that an investor could not derive easily based on its industry affiliation.

The second possibility is that disclosures are in fact less informative than we might hope because they do not reflect a major source of risk: industry-wide risk. This is supported by the fact that several of the consolidated categories, such as government and macro risks, are common across almost all of the companies in our sample. In fact, the 10 most common categories are present in well over half of the companies. To test this further, one would need a method of identifying the expected similarity between two given companies' risk disclosures, to understand the similarity two randomly selected annual reports.

A third possibility is that our analysis simply used a sample size that was too small to detect statistically significant differences between categories. (To check this, one would need to repeat the analysis with a substantially larger sample size, and/or develop an automated method of categorizing large numbers of 10-K filings.)

The final step of our analysis consisted of evaluating the relationship between our categorizations and various accounting metrics. We used four different independent variables, normalized as appropriate to account for firm size:

- Total debt (divided by total assets)

- Capital expenditures (divided by net property, plant, and equipment)
- Cash (divided by total assets)
- Cash acquisitions (divided by net property, plant, and equipment)

As independent variables, we used the following:

- All operating risk categories (as binary variables); we included the following consolidated risk categories as "operating risk":

competition	macro
credit risk	intellectual property
customer concentration	operations
inventory	contracts
distribution	suppliers
government	labor
industry	

Table 4

- Total number of risk factors, as well as the logarithm of the total number of risk factors

First, we conducted the regression of total debt upon operating risk, and found the following:

Dependent Variable	Debt / Total Assets	
Independent Variable	**Parameter Estimate**	**P-Value**
intercept	0.283	0.016
'competition'	0.182	0.060
'credit risk'	-0.029	0.778
'customer concentration'	-0.053	0.460
'inventory'	0.072	0.523
'distribution'	0.018	0.842
'government'	0.033	0.743
'industry'	0.136	0.094
'macro'	-0.151	0.061
'intellectual property'	-0.090	0.248
'operations'	-0.083	0.287
'contracts'	0.005	0.946
'suppliers'	-0.010	0.885
'labor'	0.090	0.443
R-square	0.103	
F-test P-Value	0.503	

Table 5

This regression was clearly insignificant overall, but more surprisingly, we found that none of the operating risk categories predicted debt amount in a statistically significant way. In addition, we found that only around 10 percent of the variance in the dependent variable can be explained by these categories, as indicated by the low R^2 value.

However, several of the coefficient signs were somewhat interesting. For example, both competition and macro risks were approaching significance (and perhaps would be significant in a larger sample), but competition seemed to result in increased leverage while macroeconomic risks resulted in reduced leverage. One possible explanation is that competition forces firms to be more aggressive in the market, leading them to borrow more and take more risks, while macro risk factors cannot be predicted or “defeated,” and should therefore result in reduced leverage.

We next checked for the relationship between leverage (debt divided by total assets) and the total number of risk factors:

Dependent Variable	Debt / Total Assets			**Dependent Variable**	Debt / Total Assets	
Independent Variable	**Parameter Estimate**	**P-Value**		**Variable**	**Independent Variable**	**P-Value**
intercept	0.291	0.005		intercept	0.180	0.505
total number of risk factors	-0.001	0.906		log(total number of risk factors)	0.039	0.720
R-square	0.000			**R-square**	0.001	
F-test P-Value	0.906			**F-test P-Value**	0.720	

Table 6

However, we found that neither the total number of risk factors nor its logarithm was a significant explanatory factor. Based on previous work[6] that has found a relationship between market-based risk measures and length of risk disclosures, we did expect some relationship since the total number of risk factors should be associated with disclosure length. Therefore, we were surprised to find no relationship.

We next investigated the relationship between total capital expenditures and operating risk, and found the following:

[6] Campbell, John L. et al. "The Information Content of Mandatory Risk Factor Disclosures in Corporate Filings." *SSRN eLibrary* (2010): 10 May 2011.

Dependent Variable	CapEx / PPE	
Independent Variable	**Parameter Estimate**	**P-Value**
intercept	0.245	0.000
'competition'	-0.045	0.356
'credit risk'	-0.004	0.942
'customer concentration'	-0.033	0.353
'inventory'	0.019	0.741
'distribution'	0.015	0.751
'government'	0.043	0.394
'industry'	-0.065	0.111
'macro'	0.003	0.948
'intellectual property'	0.132	0.001
'operations'	0.042	0.288
'contracts'	0.044	0.266
'suppliers'	-0.027	0.448
'labor'	-0.086	0.145
R-square	0.272	
F-test P-Value	0.001	

Table 7

Quite interestingly, we found this regression to be significant overall, but the only significant independent variable was intellectual property, with a positive relationship. This seems quite reasonable and expected, since firms with significant capital expenditures often have significant amounts of money invested in research and development infrastructure.

We also found a significant relationship between capital expenditures and the total number of risk factors:

Dependent Variable	CapEx / PPE			Dependent Variable	CapEx / PPE	
Independent Variable	**Parameter Estimate**	**P-Value**		**Independent Variable**	**Parameter Estimate**	**P-Value**
intercept	0.154	0.007		intercept	-0.095	0.518
total number of risk factors	0.013	0.005		log(total number of risk factors)	0.162	0.007
R-square	0.063			**R-square**	0.062	
F-test P-Value	0.005			**F-test P-Value**	0.007	

Table 8

This was surprising given our results on leverage and total number of risk factors. We cannot explain the fact that capital expenditures seem more sensitive to the total number of risk factors described in item 1A.

We found very similar results when we next compared cash to operating risk and total number of risk factors:

Cash		
Dependent Variable	Cash / Total Assets	
Independent Variable	**Parameter Estimate**	**P-Value**
intercept	0.121	0.030
'competition'	-0.038	0.403
'credit risk'	0.026	0.599
'customer concentration'	-0.031	0.361
'inventory'	0.005	0.924
'distribution'	-0.023	0.594
'government'	0.082	0.085
'industry'	-0.018	0.640
'macro'	-0.068	0.078
'intellectual property'	0.154	0.000
'operations'	0.017	0.644
'contracts'	0.084	0.027
'suppliers'	-0.061	0.075
'labor'	0.001	0.982
R-square	0.359	
F-test P-Value	0.000	

Table 9

Dependent Variable	Cash / Total Assets			**Dependent Variable**	Cash / Total Assets	
Independent Variable	**Parameter Estimate**	**P-Value**		**Independent Variable**	**Parameter Estimate**	**P-Value**
intercept	0.013	0.812		intercept	-0.180	0.227
total number of risk factors	0.013	0.004		log(total number of risk factors)	0.143	0.018
R-square	0.067			**R-square**	0.047	
F-test P-Value	0.004			**F-test P-Value**	0.018	

Table 10

Interestingly, we noticed similar relationships for cash that we saw for capital expenditures. We hypothesized that this could be because of a strong correlation between amounts of cash that a company holds and the amount of capital expenditures it can undertake, and we found the correlation between these two independent variables to be 0.46.

Finally, when we used acquisitions (normalized by dividing by total PPE) as a dependent variable, we found almost no predictive power:

Dependent Variable	Acquisitions / PPE	
Independent Variable	**Parameter Estimate**	**P-Value**
intercept	0.075	0.884
'competition'	0.336	0.430
'credit risk'	-0.256	0.591
'customer concentration'	-0.050	0.874
'inventory'	0.843	0.091
'distribution'	-0.141	0.726
'government'	0.227	0.605
'industry'	-0.011	0.977
'macro'	-0.007	0.983
'intellectual property'	0.220	0.526
'operations'	-0.365	0.292
'contracts'	-0.290	0.411
'suppliers'	0.133	0.679
'labor'	-0.303	0.559
R-square	0.057	
F-test P-Value	0.923	

Table 11

Dependent Variable	Acquisitions / PPE			**Dependent Variable**	Acquisitions / PPE	
Independent Variable	**Parameter Estimate**	**P-Value**		**Independent Variable**	**Parameter Estimate**	**P-Value**
intercept	-0.246	0.573		intercept	-1.516	0.191
total number of risk factors	0.052	0.138		log(total number of risk factors)	0.765	0.102
R-square	0.019			**R-square**	0.023	
F-test P-Value	0.138			**F-test P-Value**	0.102	

Table 12

Conclusions

Our investigation made three conclusions. First, we found that certain risk factor categories, such as government and competitive risks, were mentioned in the vast majority of risk factor disclosures.

Second, we found that for most risk factor categories, there were not statistically significant differences across industries. However, a few categories, such as international and supplier risk, seemed significant, though we could not explain these results.

Third, we found through our regression analysis that intellectual property risk and total number of risk factors were statistically predictive of both capital expenditures and cash, but not of leverage or acquisitions. Overall, however, we found that operating risk factor disclosure were not useful in predicting a firm's financial accounting characteristics. While we proposed some explanations for these results, further analysis could certainly investigate these relationships further.

Future Work

Perhaps the easiest possibility for future analysis involves increasing our sample size to understand whether our lack of significance when exploring differences across industry is simply because of a lack of power given the fact that we are only using 122 firms. One variant could be developing an electronic/automated method of processing large numbers of annual filings.

Second, future studies could explore relationships between risk and a firm's financial performance longitudinally over time, or for specific high-risk industries (such as energy

exploration, for example) since risk disclosures in such industries should have much more meaning and importance for both investors and regulators.

Third, future studies could explore market reactions to risk disclosures in more detail to identify whether disclosures result in more efficient allocation of capital. This could be in the form of measuring changes in the risk factor disclosures in annual filings, separating their effect from financial performance effects, and measuring the effect of these changes in variables such as stock prices, bond yields, etc.

We would also be interested in exploring whether risk factors can be used instead of stock price volatility or earnings volatility to measure firm risk. Thus, another exploration could measure the relationship between market-based risk measures and qualitative risk factors, and seeing whether relationships that are observed for market-based measures are also present when conducting the analysis using qualitative factors.

A final possibility for future exploration is to analyze the relationship between a firm's risk disclosures and key person life insurance. Many firms purchase life insurance on their chief executives or presidents ("key personnel"), especially if the firm's leader provides specific technical expertise and is anticipated to stay in the company for an extended period. Moreover, many firms disclose the life insurance they purchase for their executives. Since purchasing key person life insurance is, in some ways, a measure of the risk aversion of the firm's leadership, we would be interested in looking at whether the risk categorizations we previously developed have any relationship with key person life insurance. This would pose some challenges with data collection, as firms often do not provide enough specific details about the key person life insurance that they purchase (for example, which executives are insured, for exactly how much, and how much this insurance costs), which could make meaningful analysis impractical.

Appendix I

The following tables list the legal name and COMPUSTAT GVKEY identification number for all the companies in our random sample.

Company Legal Name	COMPUSTAT GVKEY		Company Legal Name	COMPUSTAT GVKEY
Avon Products Inc.	1920		America's Car-Mart Inc	13602
Campbell Soup Co	2663		Dell Inc	14489
Cardinal Health Inc	2751		Concord Camera Corp	14808
Crane Co.	3580		Lattice Semiconductor Corp	16597
Crown Holdings Inc	3619		Fisher Communications Inc	18364
Duckwall Alco Stores Inc	4090		G III Apparel Group Ltd	19402
Environmental Tectonics Corp	4415		Contango Oil & Gas Co	22053
Jo-Ann Stores Inc.	4523		Wet Seal Inc (The)	22612
Ferro Corp.	4622		Exponent Inc	23027
HEICO Corp	5567		Community Health Systems Inc	23714
Herley Industries Inc	5594		ARI Network Services Inc	24670
Hovnanian Enterprises Inc.	5750		Genta Inc	24781
PhotoMedex Inc	6598		Vitesse Semiconductor Corp	24803
Florida Gaming Corp	6694		Terra Nitrogen Co LP	24965
Medical Action Industries Inc	7205		McAfee Inc	25783
Methode Electronics Inc	7291		Innodata Isogen Inc	28717
Myers Industries Inc.	7636		Oxigene Inc	28795
Northrop Grumman Corp	7985		Ultratech Inc	28938
Potlatch Corp	8692		AK Steel Holding Corp	29968
Regis Corp	9023		Eagle Materials Inc	30032
Lodgian Inc.	9614		International Textile Group Inc	30169
Standard Motor Products Inc.	10000		McMoRan Exploration Co	30234
Tellabs Inc	10420		GEO Group Inc (The)	30536
US 1 Industries Inc	10676		Stillwater Mining Co	31203
United Stationers Inc	10981		Borders Group Inc	31849
Vulcan Materials Co	11228		Socket Mobile Inc	60801
Meridian Resource Corp (The)	12046		Wayside Technology Group	61028
Astec Industries Inc.	12262		Tarrant Apparel Group	61060
Harley-Davidson Inc.	12389		Opko Health Inc	61490
IsoRay Inc	12818		Buckeye Technologies Inc	61596
Nobel Learning Communities Inc	12855		Westell Technologies Inc	61646
Georgia Gulf Corp.	12895		Nuance Communications Inc	61685

(continued on next page)

Company Legal Name	COMPUSTAT GVKEY		Company Legal Name	COMPUSTAT GVKEY
Pinnacle Data Systems Inc.	62768		Martin Midstream Partners LP	150201
Genesee & Wyoming Inc.	63123		Universal Technical Institute Inc.	156633
Diedrich Coffee Inc	63572		Santarus Inc	157954
Q.E.P. Co. Inc	63593		Metalico Inc	160474
Penske Automotive Group Inc	63847		Westlake Chemical Corp	160684
Famous Dave's of America Inc	63930		NationsHealth Inc	161816
Take-Two Interactive Software Inc	64630		Peoples Educational Holdings Inc	161869
Evolving Systems Inc	110529		Unica Corp	162355
Interstate Hotels & Resorts Inc.	113439		Sunesis Pharmaceuticals Inc	162585
Tigrent Inc	114242		Rockwood Holdings Inc	162957
Vignette Corp	118445		Lotus Pharmaceuticals Inc	163088
Varian Inc	119216		Solar Enertech Corp	165269
Priceline.Com Inc	119314		Coleman Cable Inc	165640
PLX Technology Inc	119493		Viacom Inc	165675
tw telecom inc	120359		Castle Brands Inc	165691
Salem Communications Corp	121817		H&E Equipment Services Inc	165856
Next Inc	122914		Global Traffic Network Inc	166402
Maxygen Inc	127481		Volcano Corp	174118
Sequenom Inc	128663		Pharmasset Inc	174507
Occam Networks Inc	137130		EV Energy Partners LP	175006
deCODE genetics Inc	137803		Armstrong World Industries Inc	175689
Illumina Inc	138205		XTENT Inc	175743
Peet's Coffee & Tea Inc	140897		Universal Power Group Inc	176325
Seattle Genetics Inc	141460		Accuray Inc	176670
Lawson Software Inc	144135		HSW International Inc	178494
Asbury Automotive Group Inc	144640		Power Medical Interventions Inc	178722
Corcept Therapeutics Inc	146616			
Cycle Country Accessories Corp	147101			
Overstock.com Inc	147868			
TransDigm Group Inc	148349			
TravelCenters of America LLC	148350			
Nile Therapeutics Inc	148552			

Appendix II

Our initial categorization of risk factors consisted of 116 categories, listed below:

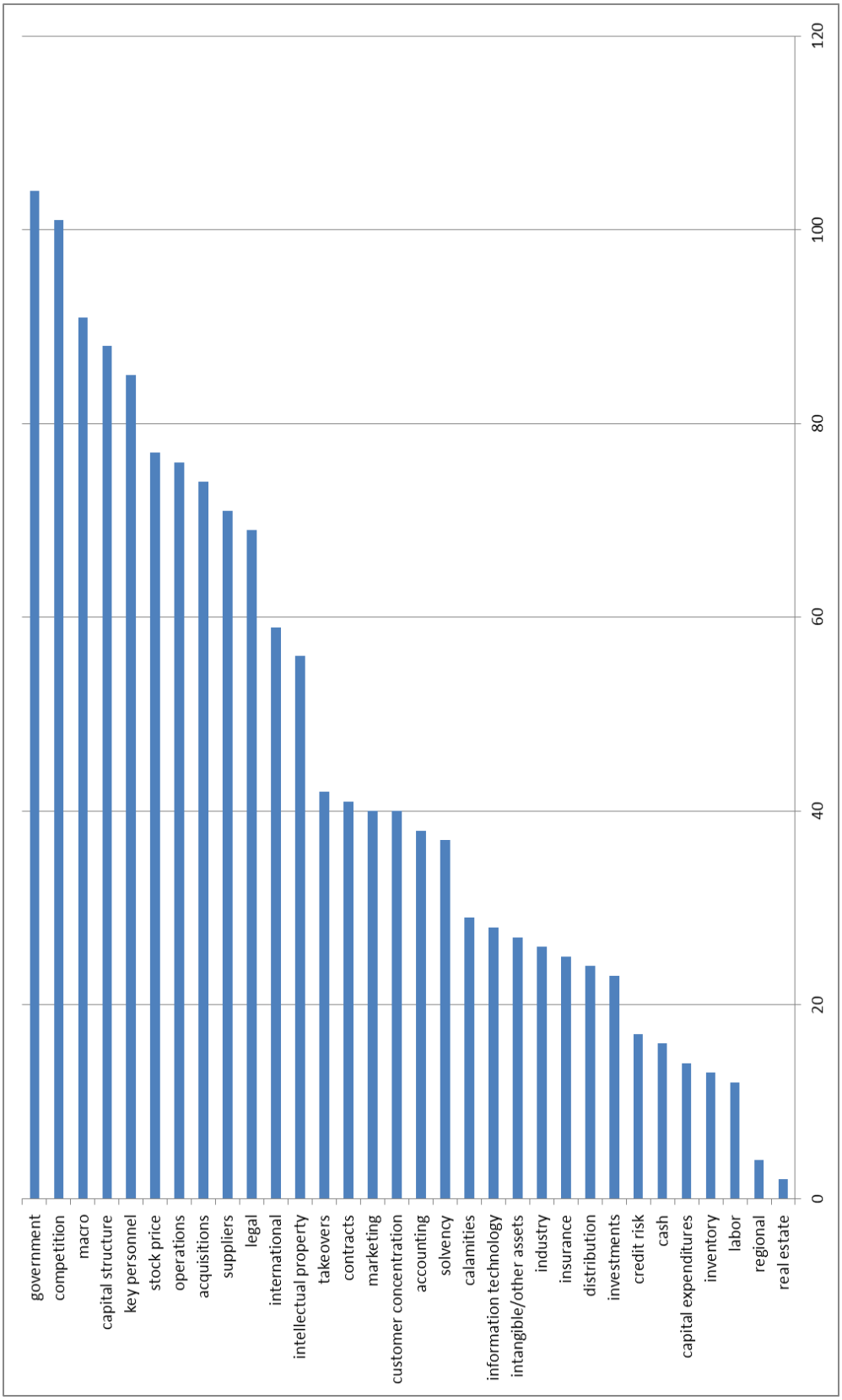
accounting control	industry condition	quarterly variation
accounting standards	inflation	raw materials availability
acquisitions	information security	raw materials prices
assets: liens	information technology	real estate
brand	insurance	region-specific
brand concentration	interest rates	regulatory
capital availability	international (non-US) risk	regulatory: government contracts
capital expenditures	international markets (challenges)	reputation
cash requirements	inventory management	research and development
charter documents	IP	restructuring
competition	IP: legal defense	revenue: inconsistent
competition: lower prices	IP: value	safety
consumer preferences	joint ventures	seasonality
contracts: estimated value	key personnel	shareholder rights plan
cost savings	key personnel: insurance	single product
credit rating	leases	stock price
credit risk	legal / litigation	stock price: delisting
currency / exchange rates	liability	stock price: issuance b/c of derivatives
customer concentration	liquidity / investments	stock price: volatility
cyclical business	losses: future	stock: no dividends
debt: additional	losses: past	stock: thinly traded
debt: covenants	macroeconomy	subcontractors
debt: highly levered	management ownership	substitute products
debt: refinancing	manufacturing / technical	suppliers: concentration
deferred taxes	market acceptance	suppliers: promotions
delivery delays	market share	supply chain
demand: unpredictable	marketing effectiveness	supply chain: foreign
dispositions	merger benefits	tax legislation
distribution channels	natural disasters	technological change
energy prices	new management	technology: unproven
environmental	new products	terrorism / war
financial crisis	new stores	third party
financial services	ongoing legal proceedings	transportation
fixed price contracts	operating risk	unions / labor
franchise terminations	ownership concentration	weather
going concern	pension / retirement benefits	working capital
goodwill write downs / intangible asset risk	political	
government contracts/funding	pricing	
government programs	product quality	
industry changes	production delay	

Appendix III

After the initial categorization, the categories were consolidated according to the following table:

Consolidated Category	Original Categories
accounting	accounting control, accounting standards
acquisitions	acquisitions, cost savings, joint ventures, merger benefits, restructuring
calamities	natural disasters, terrorism / war, weather
capital expenditures	capital expenditures, research and development
capital structure	assets: liens, capital availability, credit rating, debt: additional, debt: covenants, debt: highly levered, debt: refinancing, interest rates
cash	cash requirements
competition	competition, competition: lower prices, substitute products
contracts	contracts: estimated value, fixed price contracts, franchise terminations, subcontractors, third party
credit risk	credit risk
customer concentration	customer concentration
distribution	distribution channels, transportation
government	environmental, government contracts/funding, government programs, political, regulatory, regulatory: government contracts, tax legislation
industry	industry changes, industry condition
insurance	insurance
intellectual property	IP, IP: legal defense, IP: value
international	currency / exchange rates, international (non-US) risk, international markets (challenges)
inventory	delivery delays, inventory management
investments	liquidity / investments, pension / retirement benefits
key personnel	key personnel, key personnel: insurance, new management
labor	unions / labor
legal	legal / litigation, liability, ongoing legal proceedings, safety
macro	cyclical business, demand: unpredictable, financial crisis, financial services, inflation, macroeconomy, quarterly variation, revenue: inconsistent, seasonality
marketing	brand, brand concentration, consumer preferences, market acceptance, market share, marketing effectiveness, pricing, reputation
operations	leases, manufacturing / technical, new products, new stores, operating risk, product quality, production delay, single product, technological change, technology: unproven, working capital
regional	region-specific
solvency	going concern, losses: future, losses: past
stock price	management ownership, ownership concentration, stock price, stock price: delisting, stock price: issuance b/c of derivatives, stock price: volatility, stock: no dividends, stock: thinly traded
suppliers	energy prices, raw materials availability, raw materials prices, suppliers: concentration, suppliers: promotions, supply chain, supply chain: foreign
takeovers	charter documents, shareholder rights plan

Appendix IV


government
competition
macro
capital structure
key personnel
stock price
operations
acquisitions
suppliers
legal
international
intellectual property
takeovers
contracts
marketing
customer concentration
accounting
solvency
calamities
information technology
intangible/other assets
industry
insurance
distribution
investments
credit risk
cash
capital expenditures
inventory
labor
regional
real estate
0
20
40
60
80
100
120

Appendix V

	accounting	acquisitions	calamities	capital expenditures	capital structure	cash	competition	contracts	credit risk	customer concentration	distribution	government	industry	insurance	intellectual property
accounting															
acquisitions	0.07														
calamities	0.16	0.21													
capital expenditures	0.04	0.18	-0.02												
capital structure	0.18	0.06	0.13	0.11											
cash	0.05	0.01	0.01	0.09	0.13										
competition	0.17	0.17	0.05	0.10	0.15	0.18									
contracts	-0.10	-0.07	0.05	0.18	0.17	-0.07	0.09								
credit risk	0.14	0.08	0.11	0.00	0.04	-0.02	0.12	-0.19							
customer concentration	0.06	0.06	0.06	0.08	0.04	0.14	0.04	-0.09	0.02						
distribution	0.16	0.15	0.01	-0.05	0.17	0.11	0.06	0.00	0.28	-0.08					
government	0.13	0.23	0.12	0.08	0.26	0.09	0.30	0.15	0.17	0.00	0.09				
industry	-0.05	0.09	0.04	0.00	-0.08	-0.02	-0.03	0.05	-0.04	0.11	-0.06	-0.01			
insurance	0.14	-0.09	0.05	0.07	0.22	0.04	0.02	0.15	0.09	-0.05	0.00	0.04	-0.07		
intellectual property	0.06	0.03	-0.01	0.13	-0.05	-0.07	0.29	0.35	-0.09	-0.08	0.08	0.10	0.04	-0.10	
international	0.20	0.21	0.08	0.06	0.05	-0.13	0.22	-0.10	-0.01	0.09	0.18	0.17	-0.06	0.00	0.33
inventory	-0.06	0.01	0.06	-0.04	0.16	0.10	-0.05	-0.08	-0.06	0.10	0.16	0.07	-0.05	-0.04	-0.05
investments	-0.01	0.05	0.08	-0.11	-0.03	-0.13	0.00	-0.08	-0.01	0.11	0.03	0.14	0.01	-0.09	0.06
key personnel	0.21	-0.06	0.03	0.13	0.11	-0.06	0.17	0.32	-0.15	-0.22	0.06	0.13	0.04	0.07	0.39
labor	0.02	0.04	-0.06	0.05	-0.04	0.03	0.08	-0.23	0.19	0.00	0.11	-0.02	0.03	-0.03	-0.14
legal	0.09	0.04	-0.05	0.11	0.08	0.05	0.17	0.03	-0.03	-0.20	0.10	0.15	-0.11	0.04	0.21
macro	0.11	0.15	0.02	0.03	0.14	0.00	0.13	-0.02	0.07	0.01	0.24	0.13	0.07	0.06	0.01
marketing	0.10	0.03	0.10	0.19	0.12	-0.12	0.09	0.13	0.07	-0.12	0.23	0.14	-0.02	0.12	0.23
operations	0.05	0.07	0.12	-0.04	0.08	-0.05	0.23	0.23	0.02	-0.11	0.04	0.20	0.03	0.06	0.41
regional	-0.02	-0.04	-0.10	-0.07	0.01	-0.07	0.08	-0.13	0.06	-0.13	0.02	-0.05	0.02	-0.09	-0.17
solvency	0.06	-0.05	0.09	0.21	0.29	0.01	0.02	0.36	-0.01	-0.12	0.03	0.17	0.00	-0.03	0.32
stock price	0.11	0.05	0.07	0.06	0.21	0.10	0.19	0.18	-0.13	-0.12	0.08	0.16	0.02	0.14	0.36
suppliers	0.07	0.07	-0.03	-0.06	0.14	0.08	0.01	-0.24	0.20	0.03	0.21	0.02	-0.01	0.02	-0.05
takeovers	0.07	0.12	0.04	0.06	0.10	-0.03	0.06	0.21	-0.04	-0.03	0.12	0.16	-0.04	-0.03	0.30

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	international	inventory	investments	key personnel	labor	legal	macro	marketing	operations	regional	solvency	stock price	suppliers	takeovers
accounting														
acquisitions														
calamities														
capital expenditures														
capital structure														
cash														
competition														
contracts														
credit risk														
customer concentration														
distribution														
government														
industry														
insurance														
intellectual property														
international														
inventory	0.20													
investments	0.12	-0.03												
key personnel	0.17	0.05	0.00											
labor	0.12	-0.02	0.12	-0.14										
legal	0.09	-0.07	0.00	0.14	0.07									
macro	0.19	0.20	0.09	0.11	0.13	0.10								
marketing	0.13	0.10	-0.07	0.16	-0.05	0.26	0.13							
operations	0.14	0.10	0.03	0.19	-0.08	0.03	0.13	0.26						
regional	-0.18	0.09	0.03	0.02	0.09	-0.02	0.11	-0.03	-0.14					
solvency	-0.07	0.00	-0.14	0.28	-0.04	0.15	-0.07	0.22	0.18	-0.02				
stock price	0.30	0.10	-0.20	0.35	-0.09	0.22	-0.06	0.28	0.25	-0.15	0.32			
suppliers	-0.01	0.08	0.07	-0.20	0.22	-0.01	0.15	0.03	0.09	-0.03	0.05	-0.03		
takeovers	0.16	-0.03	-0.08	0.14	-0.12	0.01	-0.05	0.08	0.03	-0.13	0.31	0.38	-0.05	

Appendix VI

	Mining & Construction	Manufacturing	Manufacturing	Transportation, Comm., Utilities	Wholesale & Retail Trade	Services	Services
	SIC Code 1000	SIC Code 2000	SIC Code 3000	SIC Code 4000	SIC Code 5000	SIC Code 7000	SIC Code 8000
accounting	0.29	0.08	0.34	0.17	0.44	0.47	0.38
acquisitions	0.71	0.60	0.61	0.33	0.44	0.82	0.63
calamities	0.14	0.20	0.22	0.50	0.11	0.41	0.25
capital expenditures	0.29	0.16	0.07	0.00	0.06	0.12	0.25
capital structure	1.00	0.76	0.71	0.67	0.72	0.59	0.75
cash	0.14	0.12	0.17	0.17	0.17	0.00	0.13
competition	0.86	0.92	0.83	0.67	0.78	0.76	0.88
contracts	0.43	0.32	0.29	0.50	0.22	0.47	0.38
credit risk	0.29	0.04	0.17	0.17	0.17	0.12	0.13
customer concentration	0.29	0.28	0.39	0.50	0.22	0.29	0.38
distribution	0.14	0.16	0.24	0.17	0.28	0.18	0.00
government	1.00	0.80	0.90	0.67	0.67	0.94	1.00
industry	0.14	0.04	0.22	0.50	0.22	0.35	0.25
insurance	0.57	0.12	0.17	0.33	0.22	0.18	0.25
intellectual property	0.00	0.52	0.61	0.17	0.28	0.59	0.25
international	0.00	0.44	0.68	0.17	0.28	0.76	0.13
inventory	0.00	0.12	0.15	0.00	0.22	0.00	0.00
investments	0.14	0.24	0.27	0.00	0.06	0.12	0.25
key personnel	0.57	0.56	0.76	0.67	0.78	0.71	0.75
labor	0.00	0.16	0.12	0.33	0.06	0.00	0.00
legal	0.43	0.56	0.63	0.50	0.50	0.53	0.63
macro	0.71	0.60	0.78	0.67	0.89	0.82	0.63
marketing	0.29	0.36	0.27	0.17	0.28	0.41	0.63
operations	0.71	0.68	0.76	0.33	0.44	0.53	0.50
regional	0.14	0.04	0.00	0.00	0.11	0.00	0.00
solvency	0.43	0.44	0.29	0.17	0.22	0.29	0.13
stock price	0.43	0.72	0.68	0.33	0.50	0.76	0.50
suppliers	1.00	0.56	0.78	0.17	0.72	0.12	0.25
takeovers	0.14	0.44	0.37	0.00	0.28	0.47	0.25