Finance Research Letters 55 (2023) 103895

Contents lists available at ScienceDirect

Finance Research Letters

journal homepage: www.elsevier.com/locate/frl

Organizational capital and readability of financial reports

Humnath Panta [a,*], Ayush Panta [b]

[a] School of Business, Cal Poly Humboldt, Arcata, 95521, CA, USA
[b] University of California Berkeley, Berkeley, 94720, CA, USA

ARTICLE INFO

JEL classifications:
M41
G41

Keywords:
Organizational capital
Readability
10-Ks
Annual reports

ABSTRACT

This study uses pooled OLS technique to examine the effect of organizational capital on the readability of 10-Ks reports of a large sample of US firms from 1993 to 2019. The main finding reveals that firms with higher organizational capital report more readable 10-Ks. The effect of organizational capital on readability continues to be significant even after SEC's Plain English Rules of 1998. Our findings also reveal that organizational capital lessens the adverse effects of loss on the readability of annual reports. Overall, our findings reveal the importance of organizational capital in how a company disseminates information in its annual reports.

1. Introduction

Organizational capital is a production factor embodied in a firm's key talent. Recent studies in corporate finance have emphasized the importance of organizational capital (OC hereafter) in corporate settings. These studies find that firms with higher OC have higher average returns (Eisfeldt and Papanikolaou, 2013), greater productivity (Chen and Inklaar, 2016), lower implied cost of capital (Attig and Ghoul, 2018), and superior acquisition deals performance (Li et al., 2018). They also have higher cash holdings (Marwick et al., 2020), increased tax efficiency and firm value (Hasan et al., 2021), greater corporate innovation activities (Cui et al., 2021; Francis et al., 2021), and higher dividend payouts (Hasan and Uddin, 2022).

There are also various studies examining how shareholders and creditors value the readability of a company's annual reports. These studies find that less readable annual reports are associated with a decreased firm value (Hwang and Kim, 2017), higher load spreads, shorter debt maturities, higher collateral (Ertugrul et al., 2017), lower trade credit (Xu et al., 2020), longer audit delays/increased fees (Blanco et al., 2020), and higher cost of equity (Rjiba et al., 2021).

Recent studies have also found that the concept of organizational capital captures the most considerable portion of intangible assets in the US and provides firms with a sustainable competitive advantage, thus leading to superior performance (Corrado et al., 2009; Eisfeldt and Papanikolaou, 2013). Despite the tremendous growth in the literature regarding the influence of OC, the role of OC on the readability of annual reports remains largely unexplored. Therefore, this study attempts to bridge this gap in the literature by empirically investigating this relationship. By examining the relationship between organizational capital and financial report readability, researchers can gain a better understanding of how companies can effectively communicate financial information to stakeholders. This knowledge can be used to help companies improve their financial reporting practices and build stronger relationships with stakeholders.

Organizational capital was introduced by Prescott & Visscher (1980) and was later defined as one of the most crucial intangible

* Corresponding author.
E-mail address: humnath.panta@humboldt.edu (H. Panta).

https://doi.org/10.1016/j.frl.2023.103895
Received 6 March 2023; Received in revised form 7 April 2023; Accepted 12 April 2023
Available online 13 April 2023

assets by Lev & Radhakrishnan (2005). These studies emphasize that OC includes business processes and systems, including the commitments to regulations that increase resource productivity. Organizational capital is also closely related to both company patterns and managerial skills (Cui et al., 2021). Therefore, considering these statements, as well as the fact that poor readability is often associated with attempts to hide negative news about a firm, we hypothesize that a firm with a higher OC will write more readable reports.

Using a large sample of US firms from 1993 to 2019, we find that firms with higher OC have more readable annual reports, consistent with our hypothesis. We divide this sample into high and low OC firms and conduct univariate tests. This study finds an average Bog Index of 82.879 for high OC firms and 85.39 for low OC firms, indicating a significant difference at a 1% significance level. The results continue to hold in a multivariate setting where we control for various firm-level determinants, as in Li (2008), including the year and industry effects. The findings imply that, depending on the method of OC measurement, a one standard deviation increase in OC is associated with a 0.56% – 0.86% decrease in the Bog Index relative to the mean. The results suggest that the findings of the study are meaningful and important in terms of their potential impact on the readability of annual reports. This research makes a significant contribution to existing literature. First, it provides evidence of the importance of organizational capital in firms' disclosure practices. Second, it expands the readability literature by focusing on intangible forms of wealth such as OC.

The rest of the paper is organized as follows. Section 2 describes the sample and defines the variables. Section 3 discusses the methodology and empirical findings. Section 4 concludes the research's findings.

2. Data and methodology

2.1. Data and sample

This study follows Bonsall et al. (2017)[1] and uses the Bog Index to measure the readability of 10-Ks. We have paired the Bog Index data with Compustat and CRSP data. Our final sample consists of 50,618 firm-year observations, excluding firms in utility and financial industries, for publicly traded firms from 1993 to 2019. All firm-level continuous control variables are winsorized at the top and bottom 1% to address to impact of outliers in our findings.

2.2. Readability of annual reports

Following recent studies (Bonsall et al., 2017; Cassell et al., 2019), we use the Bog Index[2] as a measure of the readability of 10-Ks. It is a multifaceted measure of plain English readability. It is constructed as the sum of Sentence Bog, Word Bog, and Pep. Sentence bog measures the extent to which a reader may get bogged down due to sentence characteristics. Word bog measures sentence length and word difficulty, while Pep counts the hallmark features of good writing, such as names, interesting words, conversational expressions, and the standard deviation of sentence length divided by average sentence length. A higher Bog Index indicates less readable annual reports. Bog Index is available when there are at least 3000 words remaining in the parsed document (10-Ks).

The Bog Index is a significant improvement on the Fog Index, the classical measure of readability. The Fog Index is a linear combination of the percent of complex words and the average number of words in a sentence. Longer sentences with more complex words score higher on the Fog Index. Several studies (Bonsall et al., 2017; Loughran and McDonald, 2014) indicate that words such as corporation, agreement, depreciation, liability, amortization, and investment are easily understood by investors, but the Fog Index classifies them as complex. Therefore, classifying three-syllabic words as complex is a major shortcoming. The Bog Index addresses these shortcomings by using a predetermined list of over 200,000 words that they consider as complex.

2.3. Organizational capital

Following prior studies (Eisfeldt and Papanikolaou, 2013; Gao et al., 2021), we measure a firm's OC using capitalized SG&A expenses, which represent the overall non-production costs of operating a firm. To measure OC using the perpetual inventory method, we estimated the initial value of the stock of OC for firm i as follows:

$$\mathrm{OC}_{i,0} = \frac{SG\&A_{i,1}}{g + \delta_{OC}}$$

Where, OC is the firm's organizational capital, *SG&A* is the selling and administrative expenses, g is the annual arithmetic average growth rate of *SG&A* at the company level, and δ is the depreciation rate of R&D expense. Following prior literature (Eisfeldt and Papanikolaou, 2013), we use 15% as the value of δ_{OC}. Then, we recursively construct OC by calculating the deflated value of SG&A as follows:

[1] We thank Professor Brian P. Miller for making the Bog Index data publicly available (https://host.kelley.iu.edu/bpm/activities/bogindex.html). The dataset contains Bog Index scores for 10-K filings. The data is available from January 1, 1994, to December 31, 2020.

[2] A more detailed description of the construction of the Bog Index is available on StyleWriter's website athttp://www.stylewriter-usa.com/stylewriter-editing-readability.php. See A better readability formula: StyleWriter's Bog Index and (Wright 2009) for details.

Table 1
Summary statistics.

Variables	*N*	*Mean*	*SD*	*Min*	*1st Perc.*	*Median*	*p75*	*Max*
Bog Index	50,618	84.301	8.251	48.000	65.000	84.000	90.000	163.000
OC	50,618	1.251	1.223	0.000	0.000	0.931	1.693	9.597
Size	50,618	6.736	1.736	0.069	2.912	6.639	7.866	10.540
Market to Book	50,618	1.918	1.355	0.542	0.640	1.499	2.174	11.445
Firm Age	50,618	20.685	16.453	2.000	3.000	16.000	28.000	70.000
Special Items	50,618	−0.017	0.052	−0.385	−0.311	−0.002	0.000	0.091
RetVol	50,618	0.441	0.262	0.120	0.120	0.376	0.538	1.846
EarnVol	50,618	0.056	0.083	0.005	0.005	0.032	0.061	0.830
Log[Bseg]	50,618	1.002	0.512	0.000	0.000	0.693	1.386	1.946
Log[Gseg]	50,618	1.041	0.579	0.000	0.000	1.099	1.386	2.197
Log[Nitems]	50,618	5.784	0.137	5.263	5.481	5.832	5.894	5.961
MA	50,618	0.442	0.497	0.000	0.000	0.000	1.000	1.000
SEO	50,618	0.493	0.500	0.000	0.000	0.000	1.000	1.000
DLW	50,618	0.678	0.467	0.000	0.000	1.000	1.000	1.000

This table reports the summary statistics of the variables used in our main analysis for the sample period of 1993 – 2019. The Bog Index is a proprietary measure of readability created by Editor Software's Style Writer. It is calculated as (Sentence Bog + Word Bog – Pep). Sentence Bog measures the problem of sentence length, Word Bog measures word difficulty, and Pep counts the features in the document. The higher value of the Bog Index indicates less readable annual reports. It is described and validated in Bonsall et al. (2017). OC is the organizational capital. Size is the logarithm of the market value of equity. Market to book is the market value of the firm book value of assets. Firm Age is the number of years since a firm shows up in CRSP monthly stock return files. Special Items is special items scaled by the book value of assets. RetVol is the standard deviation of the monthly stock returns in the last year. EarnVol is the standard deviation of the operating earnings in the last five fiscal years. Log[BSEG] is the logarithm of the number of business segments. Log[GSEG] is the logarithm of the number of geographic segments. Log[Nitems] is the logarithm of non-missing items on Compustat. M.A. is a dummy that equals 1 if a firm reports acquisition expense during the fiscal year and 0 otherwise. SEO is a dummy that equals 1 if a firm has a seasoned equity offering in this year and 0 otherwise. DLW is a dummy that equals 1 if a company is incorporated in Delaware and 0 otherwise. Each of the continuous variables is winsorized at 1%, and 99%.

Table 2
Univariate test results.

Panel A: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Bog Index	1.00						
(2) OC	−0.12***	1.00					
(3) Size	0.12***	−0.14***	1.00				
(4) Market to Book	0.10***	0.07***	0.39***	1.00			
(5) Firm Age	−0.08***	0.08***	0.32***	−0.06***	1.00		
(6) Special Items	−0.08***	−0.08***	0.12***	0.06***	0.06***	1.00	
(7) RetVol	0.10***	0.03***	−0.37***	−0.02***	−0.27***	−0.20***	1.00

Panel B: Univariate test results

Variables	*High OC (N = 22,740)*			*Low OC (N = 27,878)*			*Difference*	
	Mean	*Median*	*Std.Dev*	*Mean*	*Median*	*Std.Dev*	*Mean*	*P-value*
Bog Index	82.972	83.000	8.183	85.386	85.000	8.146	−2.414	0.000
Size	6.513	6.384	1.690	6.919	6.842	1.752	−0.406	0.000
Market to Book	2.000	1.577	1.378	1.852	1.442	1.332	0.148	0.000
Firm Age	22.650	18.000	16.680	19.082	14.000	16.088	3.568	0.000
Special Items	−0.019	−0.002	0.055	−0.015	−0.001	0.050	−0.004	0.000
RetVol	0.425	0.363	0.250	0.453	0.386	0.270	−0.028	0.000
EarnVol	0.049	0.030	0.063	0.062	0.033	0.095	−0.013	0.000
Log[Bseg]	0.979	0.693	0.504	1.022	0.693	0.518	−0.043	0.000
Log[Gseg]	1.059	1.099	0.547	1.026	1.099	0.603	0.033	0.000
Log[Nitems]	5.790	5.841	0.134	5.779	5.823	0.138	0.011	0.000
MA	0.432	0.000	0.495	0.449	0.000	0.497	−0.017	0.000
SEO	0.451	0.000	0.498	0.527	1.000	0.499	−0.076	0.000
DLW	0.624	1.000	0.484	0.722	1.000	0.448	−0.098	0.000

Panel A in this table reports the Pearson correlations (for brevity, most variables excluded in the table), and Panel B reports univariate test results. Significance at the 10%, 5%, and 1% levels is indicated by c, b, and a, respectively. Variable definitions are provided in Table 1.

$$\mathrm{OC}_{i,t} = (1-\delta_{OC})OC_{i,t} + \frac{SG\&A_{i,t}}{CPI_t}$$

Where, SG&A is the *SG&A* expense of a firm, *i* and *t* denote firm i and year t, CPI_t is the consumer price index at the end of fiscal year t, and δ_{OC} is the depreciation rate of OC stocks, which is set to be 15% as in Gao et al. (2021). If the portion of SG&A expenses that constitutes an investment in OC does not differ across firms, this will not affect firms' ranking in terms of OC (Li et al., 2018). Following

Table 3
Organizational capital is associated with more readable 10-Ks.

Panel A: Main results				
Variables	*(1)*	*(2)*	*(3)*	*(4)*
	Dependent variable = Bog Index			
OC	−0.386***			
	(−5.068)			
Rank_OC		−0.393***		
		(−7.049)		
IndAdj_OC			−0.392***	
			(−5.148)	
Adj_OC				−0.664***
				(−7.636)
Size	0.335***	0.297***	0.336***	0.291***
	(5.616)	(5.029)	(5.642)	(4.902)
Market to Book	−0.192***	−0.160***	−0.191***	−0.186***
	(−3.160)	(−2.650)	(−3.148)	(−3.089)
Firm Age	−0.037***	−0.035***	−0.037***	−0.034***
	(−5.938)	(−5.730)	(−5.956)	(−5.540)
Special Items	−6.935***	−7.062***	−6.920***	−6.985***
	(−10.808)	(−11.031)	(−10.783)	(−10.943)
RetVol	3.395***	3.299***	3.386***	3.327***
	(17.071)	(16.716)	(17.029)	(16.832)
EarnVol	6.140***	5.988***	6.090***	5.768***
	(9.455)	(9.317)	(9.391)	(9.031)
Log[Bseg]	1.109***	1.108***	1.111***	1.101***
	(7.949)	(7.959)	(7.962)	(7.933)
Log[Gseg]	−0.188	−0.135	−0.190	−0.171
	(−1.434)	(−1.029)	(−1.447)	(−1.312)
Log[Nitems]	0.234	1.430	0.192	0.576
	(0.160)	(0.972)	(0.131)	(0.396)
MA	0.703***	0.727***	0.705***	0.701***
	(6.476)	(6.720)	(6.494)	(6.511)
SEO	0.823***	0.774***	0.825***	0.774***
	(8.345)	(7.912)	(8.368)	(7.884)
DLW	1.057***	1.046***	1.057***	1.031***
	(5.752)	(5.697)	(5.749)	(5.627)
Observations	50,618	50,618	50,618	50,618
Adj R^2	0.462	0.465	0.462	0.465
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes

This table presents the results of the effect of organization capital on the readability of annual reports. Industry Dummies are based on SIC 2-digit industry classification code. T-stats reported in the parenthesis are calculated using clustering at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. Variable definitions are provided in Table 1.

prior literature, we also measure organizational capital as OC deciles (*Rank_OC*) to address this concern. Because of accounting practices related to the exact composition of SG&A expenses across industries, there could be measurement errors in firm-level OC (Li et al., 2018). Following prior literature (Gao et al., 2021; Li et al., 2018), we construct industry-adjusted OC (*IndAdj_OC*) to address this concern. Our fourth measure of OC (*Adj_OC*) is calculated using net SG&A, which is the net of R&D and advertising expenses.

2.4. Research design

We use the following pooled Ordinary Least Squares (OLS) regression model to test our hypothesis:

$$Bog\ \ Index_{i,t} = \alpha_0 + \beta_1 OC_{i,t} + \beta_2 X'_{i,t} + Year\ \ Dummies_t + Industry\ \text{Dummies}_j + \varepsilon_{i,t} \quad (1)$$

Where *i* refers to the firm, *t* is the fiscal year, and *j is* the industry. *Bog Index* is our measure of readability of the 10 K for firm *i* in fiscal year *t, OC* is the organizational capital, and industry dummies are based on 2-digit SIC codes. *'X'$_i$' is* a vector of control variables, and the control variables are as in Li (2008). Variable definitions are provided in Table 1.

3. Empirical results

3.1. Summary statistics

Table 1 presents summary statistics. The mean of the Bog Index is 84.301 (84) with a standard deviation of 8.8251, which are comparable to prior research (Bonsall and Miller, 2017; Hasan, 2018). The mean OC (the primary measure) is 1.251 with a standard deviation of 1.223, which is again consistent with existing research (Boubaker et al., 2022; Gao et al., 2021).

3.2. Univariate tests

Table 2 presents univariate test results. Panel A reports the correlation matrix. The correlation coefficient is negative (−0.12) and significant at a 1% significance level, supporting our main prediction that firms with higher OC report more readable annual reports. Panel B reports univariate test results. The average difference is −2.414 between high and low OC sample groups, and the difference is significant at a 1% significance level. Thus, univariate test results strongly support our prediction.

3.3. Regression results

Table 3 reports the OLS regression results using the model specified in Eq. (1). Columns (1) – (4) present regression results for the associations between various measures of OC and the Bog Index. The coefficient of each measure of OC is significant at a 1% level, thus supporting our main hypothesis that firms with higher OC write more readable annual reports. In particular, the coefficient of OC in Column (1) is negative (−0.386) and significant ($t = -5.069$) at the 1% level. These results suggest that OC is negatively associated with the Bog Index. Since a higher Bog Index implies a lower level of readability, this regression coefficient indicates that OC is associated with more readable annual reports, further supporting our hypothesis. Given the mean Bog Index of 84.301, a 0.46% (i.e., −0.386/84.301) reduction in the Bog Index from the mean is economically significant. These results also imply that a one standard deviation increase in OC is associated with a 0.56% (i.e., (1.223*−0.386)/84.301) decrease in the Bog Index relative to the mean. Thus, the test results indicate that the impact of OC on readability is not only statistically significant and but also meaningful.[3] In Columns (2), (3), and (4), we report the results of alternative measures of OC. The estimated coefficient on each measure of OC is consistent with the results in Column (1).

3.4. Robustness tests

We conduct several robustness tests to validate our main findings.

3.4.1. Propensity scores matching

It is arguable that firms that write readable annual reports may have better OC. So, it is possible that our OLS estimate's linear functional form may be causing the relationship between readability and OC. To address these concerns, we use propensity score matching (PSM) to construct a new matched sample of control firms that appear similar to the treated firms. The untabulated univariate test results show significantly lower average Bog Index scores for higher OC firms. We report the OLS regression results using the PSM sample in Panel A of Table 4. The test results support our main findings in Table 3 with a much stronger coefficient for OC.

3.4.2. Entropy balancing

One criticism of PSM is that it may not achieve an adequate co-variate balance between treatment and control groups. In contrast, the entropy balancing method proposed by Hainmueller (2012) is not dependent on a model. It instead uses an algorithm to obtain weights for each observation in a control sample. Motivated by recent research (McMullin and Schonberger, 2020; Shroff et al., 2017), we conduct analysis using the entropy balancing technique. We report these test results in Panel B of Table 3, mirroring our main results in Table 3. The coefficient for each measure of OC is again negative and significant. Our results confirm that our hypothesis continues to hold when we conduct a regression analysis after reweighting the control sample (firms with lower OC) with entropy balancing.

3.4.3. Alternative estimation techniques

The results in our findings could be driven by specific techniques, firm-specific fixed or random effects, or cross-sectional variations. To address these concerns, we repeat our analysis in Column 1 of Table 3 using firm-fixed effects, random effects, and Fama-Macbeth estimation techniques. These test results, reported in Panel C of Table 4, support our main findings.

3.4.4. Alternative measure of readability

Following Li (2008), we use Fog Index to measure readability and replicate our main results in Table 3. The Fog Index measures readability as the sum of words per sentence and the percent of complex words times 0.4, as in Li (2008). The test results are reported in Panel D of Table 4. The estimated coefficient on each measure of OC is negative and significant, again supporting our prediction that firms with high OC write more readable annual reports.

3.5. Additional results

3.5.1. Does OC matter after the passage of the SEC's Plain English Rules of 1998?

The US Security and Exchange Commission (SEC) published regulations on improving disclosure reliability in 1998, requiring firms

[3] Economic significance is comparable to existing research. For example, Hasan (2018) find one a one standard deviation increase in managerial ability is associated with a 0.45% decrease in the Bog Index relative to the mean. Xu et al. (2018) find one a one standard deviation increase in CEO age is associated with a .24% decrease in the Fog Index relative to the mean.

Table 4
Robustness tests.

Panel A: Multivariate analysis using the PSM-matched control sample				
Variables	*(1)*	*(2)*	*(3)*	*(4)*
	Dependent variable = Bog Index			
OC	−0.361***			
	(−4.732)			
Rank_OC		−0.403***		
		(−6.233)		
IndAdj_OC			−0.390***	
			(−5.138)	
Adj_OC				−0.646***
				(−7.436)
Observations	37,880	28,518	45,070	45,480
Adj R^2	0.468	0.463	0.466	0.465
Control	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Panel B: Multivariate analysis using the balanced entropy technique				
Variables	*(1)*	*(2)*	*(3)*	*(4)*
	Dependent variable = Bog Index			
OC	−0.361***			
	(−4.732)			
Rank_OC		−0.403***		
		(−6.233)		
IndAdj_OC			−0.390***	
			(−5.138)	
Adj_OC				−0.646***
				(−7.436)
Observations	37,880	28,518	45,070	45,480
Adj R^2	0.468	0.463	0.466	0.465
Control	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Panel B: Multivariate analysis using the entropy balanced technique				
Variables	*(1)*	*(2)*	*(3)*	*(4)*
	Dependent variable = Bog Index			
HighOC_Dum	−0.642***			
	(−3.261)			
HighrankOC_Dum		−0.744***		
		(−3.392)		
HighIndadjOC_Dum			−0.713***	
			(−3.747)	
HighAltOC_Dum				−1.163***
				(−5.865)
Observations	50,618	50,618	50,618	50,618
Adj R^2	0.475	0.471	0.468	0.468
Control	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes

Panel C: Multivariate analysis using alternative estimation techniques			
Variables	*(1)*	*(2)*	*(3)*
	Fixed effects	*Random effects*	*Fama-MacBeth*
	Dependent variable = Bog Index		
OC	−0.174**	−0.200***	−0.691***
	(−2.363)	(−3.269)	(−12.448)
Observations	50,618	50,618	50,618
Adj R^2	0.416	2889	0.143
Control	Yes	Yes	Yes
Year Dummies	Yes	Yes	No
Industry Dummies	No	Yes	No

Panel D: Multivariate analysis using Fog Index as a measure of readability				
Variables	*(1)*	*(2)*	*(3)*	*(4)*
	Dependent variable = Fog Index			
OC	−0.051**			
	(−2.281)			
Rank_OC		−0.038***		

(*continued on next page*)

Table 4 (*continued*)

Panel D: Multivariate analysis using Fog Index as a measure of readability				
Variables	*(1)* *Dependent variable = Fog Index*	*(2)*	*(3)*	*(4)*
		(−2.719)		
IndAdj_OC			−0.049**	
			(−2.170)	
Adj_OC				−0.077***
				(−2.885)
Observations	28,974	28,974	28,974	28,974
Adj R^2	0.053	0.053	0.053	0.053
Control	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes

This table presents robustness test results. Panel A, B, C, and D report test results for the PMS-matched sample, entropy-balanced sample, alternative estimation techniques, and alternative measures of readability, respectively. Results of the effect of organization capital on the readability of annual reports. T-stats reported in the parenthesis are calculated using clustering at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. Variable definitions are provided in Table 1.

Table 5
Additional results.

Panel A: Does organizational capital matter after the passage of the SEC *plain English Rules of 1998?*		
Variables	(1) *Pre-1998* *Dependent variable = Bog Index*	(2) *Post-1998*
OC	−0.742***	−0.303***
	(−4.600)	(−3.737)
P-value (Pre - post)1998 OC		(0.019)
Observations	6750	41,847
Adj R^2	0.339	0.433
Control	Yes	Yes
Year Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Panel B: Does organizational capital attenuates the effects of loss on 10K's readability			
Variables	*(1)* *High_OC = 1* *Dependent variable = Bog Index*	*(2)* *Low OC = 0*	*(3)* *Full sample*
Loss	0.796***	0.955***	
	(3.851)	(3.495)	
Loss & High OC			−0.114
			(−0.415)
Loss & Low OC			0.664***
			(3.278)
*P-value (High - low) OC*Loss*			(0.000)
Noloss & High OC			−1.250***
			(−4.658)
Observations	19,140	12,493	31,633
Adj R^2	0.453	0.491	0.463
Control	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes

This table presents additional test results. Panel A reports the effects of OC on readability in pre and post-1998 subsamples. Panel B shows the results examining the impact of loss in high and low OC firms. Loss & High OC is a variable that equals one if a firm has OC higher than average OC and suffers from a loss and zero otherwise. Loss & Low OC is a variable that equals one if a firm has OC lower than the mean OC and suffers from a loss and zero otherwise. Noloss & High OC is a variable that equals one if a firm has OC higher than the average and does not suffer from a loss. T-stats reported in the parenthesis are calculated using clustering at the firm level. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. Variable definitions are provided in Table 1.

to avoid vague language and formats that may hide adverse information in financial reports (Dempsey et al., 2012; Li, 2008). The SEC's Plain English Rules of 1998 have dramatically affected financial report readability (Loughran and McDonald, 2014). Therefore, it is natural to question whether OC still affects 10-K readability after implementing SEC's plain English rules. We report our tests for this in Panel A, Table 5. OC continues to be significant even after the Plain English Rules of 1998.

3.5.2. Does OC moderate the effect of experiencing a loss in readability?

The management obfuscation hypothesis predicts firms experience a loss write less readable annual reports (Li 2008). The results

presented in Column (1), Table 3 show that loss is positively associated with Bog Index, consistent with prior research (Bloomfield, 2008; Lo et al., 2017). We test whether OC moderates the effect of loss on readability. The results in Columns (1) and (2) show that the impact of loss is positive in the Bog Index. Following the econometric technique outlined for interacting two indicator variables in Wooldridge (2009), we construct four mutually exclusive indicator variables: *Loss & High OC, Loss & Low OC, NoLoss & High OC*, and *NoLoss & Low OC*. These four indicator variables are mutually exclusive, and their total sum is one. Hence, we must exclude one of these four indicator variables *(NoLoss & Low OC)* when conducting the regression analysis. Column (3) presents the test results. As expected, the estimated coefficient for *Loss & High OC* is negative (−0.114) but statistically insignificant ($t = -0.415$). In contrast, we find that Low OC firms obfuscate negative news. The coefficient for *Loss & Low OC* is positive (0.664) and significant ($t = 3.278$). The difference between coefficients for *Loss & High OC* and *Loss & Low OC* are statistically different at a 1% significance level. The test results show that OC moderates the effect of experiencing a loss in readability.

4. Conclusion

This paper empirically investigates the effect of organizational capital on the readability of annual reports using a large sample of publicly traded US firms from 1993 to 2019. Using a pooled OLS estimation technique, this study finds that firms with high levels of OC write more readable annual reports. The results are consistent across several robustness tests. This study provides evidence of the importance of organizational capital to firm disclosure practices and documents organizational capital as a key determinant of the readability of annual reports. Our findings in this paper suggest that organizational capital has an important policy implication for a firm because prioritizing organizational capital can lead to more transparent and understandable financial disclosures, which can benefit the firm, investors, and the broader public.

Funding

None.

Declaration of Competing Interest

None.

Data availability

Data will be made available on request.

References

Attig, N., el Ghoul, S., 2018. Organization capital and the cost of equity financing in medium-sized manufacturing firms. Contemp. Account. Res. 35.
Blanco, B., Coram, P., Dhole, S., Kent, P., 2020. How do auditors respond to low annual report readability? J. Account. Public Policy, 106769.
Bloomfield, R., 2008. Discussion of "Annual report readability, current earnings, and earnings persistence. J. Account. Econ. 45, 248–252.
Bonsall, S.B., Leone, A.J., Miller, B.P., Rennekamp, K., 2017. A plain English measure of financial reporting readability. J. Account. Econ. 63, 329–357.
Bonsall, S.B., Miller, B.P., 2017. The impact of narrative disclosure readability on bond ratings and the cost of debt. Rev. Account. Stud. 22, 608–643.
Boubaker, S., Hasan, M.M., Habib, A., 2022. Organization capital, tournament incentives and firm performance. Finance Res. Lett. 46.
Cassell, C.A., Cunningham, L.M., Lisic, L.L., 2019. The readability of company responses to SEC comment letters and SEC 10-K filing review outcomes. Rev. Account. Stud. 24, 1252–1276.
Chen, W., Inklaar, R., 2016. Productivity spillovers of organization capital. J. Prod. Anal. 45.
Corrado, C., Hulten, C., Sichel, D., 2009. Intangible capital and U.S. economic growth. Rev. Income Wealth.
Cui, H., Dai, L., Zhang, Y., 2021. Organization capital and corporate innovation: evidence from China. Finance Res. Lett. 43.
Dempsey, S.J., Harrison, D.M., Luchtenberg, K.F., Seiler, M.J., 2012. Financial opacity and firm performance: the readability of REIT annual reports. J. Real Estate Finance Econ. 45, 450–470.
Eisfeldt, A.L., Papanikolaou, D., 2013. Organization capital and the cross-section of expected returns. J. Finance 68.
Ertugrul, M., Lei, J., Qiu, J., Wan, C., 2017. Annual report readability, tone ambiguity, and the cost of borrowing. J. Financ. Quant. Anal. 52, 811–836.
Francis, B., Mani, S.B., Sharma, Z., Wu, Q., 2021. The impact of organization capital on firm innovation. J. Financ. Stabil. 53.
Gao, M., Leung, H., Qiu, B., 2021. Organization capital and executive performance incentives. J. Bank Financ. 123, 106017.
Hainmueller, J., 2012. Entropy balancing for causal effects: a multivariate reweighting method to produce balanced samples in observational studies. Polit. Anal. 20, 25–46.
Hasan, M.M., 2018. Readability of narrative disclosures in 10-K reports: does managerial ability matter? Eur. Account. Rev. 27, 147–168.
Hasan, M.M., Lobo, G.J., Qiu, B., 2021. Organizational capital, corporate tax avoidance, and firm value. J. Corp. Finance 70.
Hasan, M.M., Uddin, M.R., 2022. Do intangibles matter for corporate policies? Evidence from organization capital and corporate payout choices. J. Bank Financ. 135.
Hwang, B.H., Kim, H.H., 2017. It pays to write well. J. Financ. Econ. 124, 373–394.
Lev, B., Radhakrishnan, S., 2005. The valuation of organization capital. Measuring Capital in the New Economy 73–110.
Li, F., 2008. Annual report readability, current earnings, and earnings persistence. J. Account. Econ. 45, 221–247.
Li, P., Li, F.W., Wang, B., Zhang, Z., 2018. Acquiring organizational capital. Finance Res. Lett. 25.
Lo, K., Ramos, F., Rogo, R., 2017. Earnings management and annual report readability. J. Account. Econ. 63, 1–25.
Loughran, T., McDonald, B., 2014. Measuring readability in financial disclosures. J. Finance 69, 1643–1671.
Marwick, A., Hasan, M.M., Luo, T., 2020. Organization capital and corporate cash holdings. Int. Rev. Financ. Anal. 68, 101458.
McMullin, J.L., Schonberger, B., 2020. Entropy-balanced accruals. Rev. Account. Stud. 25, 84–119.
Prescott, E.C., Visscher, M., 1980. Organization capital. J. Polit. Econ. 88. Volume.
Rjiba, H., Saadi, S., Boubaker, S., Ding, X.(Sara), 2021. Annual report readability and the cost of equity capital. J. Corp. Finance 67, 101902.

Shroff, N., Verdi, R.S., Yost, B.P., 2017. When does the peer information environment matter? J. Account. Econ. 64, 183–214.
Wooldridge, J.M., 2009. Introductory Econometrics: A Modern Approach, 5th Edition. South-Western Cengage Learning.
Xu, H., Pham, T.H., Dao, M., 2020. Annual report readability and trade credit. Rev. Account. Finance 19.
Xu, Q., Fernando, G.D., Tam, K., 2018. Executive age and the readability of financial reports. Adv. Account. 43, 70–81.