Organization Capital and Firm Auditor Choice

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This study investigates the relation between auditor choice and organization capital, an intangible capital of firms. Prior research suggests that firms' intangibles are positively associated with information asymmetry between management and investors, thus increasing firms' cost of capital. Accordingly, we expect firms with more organization capital are inclined to engage higher quality audit to mitigate the information asymmetry and enhance investors' confidence in information quality. As predict, we find that organization capital is positively associated with the proxies of higher quality audit, Big 4 and industry specialist.

Keywords: Organization Capital, Information Asymmetry, Auditor Choice

INTRODUCTION

In this paper, we test the effect of U.S. firms' organization capital on their choice of auditor. Organization capital is firms' self-developed intangible capital and is defined in Evenson and Westphal (1995, p. 2237) as "the knowledge used to combine human skills and physical capital into systems for producing and delivering want-satisfying products." It distinguishes from other resources by its features that it is embodied in highly specialized labor inputs and its efficiency is firm specific. We can easily conjure some examples of organization capital in firms, like human capital and accumulated know-how about how to hire, allocate, and train people in an organization, unique systems and processes employed in the investment, production, and sales activities of the enterprise, firms' self-created information technology and brand enhancement and so on. As a collective resource, organization capital is considered as the major factor of production that is unique to the firm and thus capable of yielding abnormal returns, thereby generating enterprise growth (Lev & Radhakrishnan 2005). The importance of organization capital has gained momentum in academic studies, and a strand of literature indicates that organization capital plays a role not only in firm performance but also in corporate policy making. For instance, Lustig et al. (2011) find that organization capital contributes to the increased CEO pay inequality and pay-performance sensitivity and the accompanying decrease in labor market reallocation. Falato et al. (2013) show that the rise in intangible capital explains a big part of U.S. firms' large cash holding. In addition, organization capital and its use also provide possible explanations for corporate decisions, such as firm innovation (Francis et al. 2015) or mergers and acquisitions (Li & Zhang 2015; Li et al. 2018).

Although organization capital has a remarkable impact on corporate decisions, this topic has been vastly underexplored by audit-related literature. Our paper aims to fill this gap by investigating the effect of organization capital on auditor choice. The motivation to examine this issue arising from the viewpoint that firms with substantial intangibles, most of which are not recognized in firms' financial statements, have more information asymmetry between managers and investors and more inherent uncertainty about firm value than do other firms (Barth and Kasznik, 1999). Organization capital, an intangible resource, doesn't appear in firms' balance sheets neither, and investments in it are treated as expenses. Expensing creates amiguity among invesors about the value of intangbiles, thus increasing the information gap between management and investors (Mohd 2005). Given that organization capital increases information asymmetry, we are interested in investigating whether investors will look for other mechanisms to mitigate the information asymmetry, and whether management will respond to investors postively to enhance the confidence of investor in inforamtion quality. Audit service as a tool to reduce agent problem associated with information asymmetry between mangment and investor has been well documented and widely adopted by firms, while audit quality which determines the extent of benefit generated for investor varies across accounting firms. Therefore, we test whether firms with intensive organzation capital are more likely to employ high quality audit to reduce the information asymmetry. Overall, we argue that organization capital can intensify the demand for a high-quality audit because firm-specific information, such as organization capital, may exacerbate the information asymmetry between firm outsiders and insiders and thus require a high-quality audit to mitigate such a problem.

Audit quality is not directly observable, and several proxies are used to capture the quality of audit services. A common way of measuring audit quality is to simply see whether a firm chooses a Big 4 firm to conduct the audit (Copley & Douthett 2002; Wang *et al.* 2008). Empirically, we find that companies with greater organization capital are more likely to appoint Big 4 firms. Another stream of research suggests that, in addition to Big 4 auditors, industry-expert auditors provide a higher level of assurance than non-experts (Craswell et al. 1995, Owhoso et al. 2002 and Francis et al. 2005). Controlling for the effects of multiple variables, we also test whether organization capital is positively associated with the presence of industry expert auditors. Our sample period is from 1996 to 2018, and our primary tests provide statistically significant evidence that companies with greater organization capital are more likely to hire high-quality auditors. To examine the robustness of our results, we conduct a series of additions tests. First, ruling out the concerns that our findings may be driven by large firms, we test the effect of firms' size on auditor choice. Second, we adopt two other proxies for industry expertise to do the sensitivity analysis. Third, since the events of the passage of SOX and the financial crisis occurred during our sample period, we conduct the separate analysis to examine their effect on our findings. Finally, we adopt the instrumental variable (IV) two-stage least squares approach to address the endogeneity problem from unobservable omitted variables. The results from those robust tests are generally consistent with those from the primary empirical tests.

Our research contributes to the several strands of literature in the following ways. First, it broadens our horizons of understanding in the audit literature by investigating the attribution of organization capital to audit choice. To our knowledge, this study is the first to link intangible resources to auditing, expanding a potential research area. Second, our work contributes to an emerging literature examining the importance of firm intangibles on corporate policy making (Berk et al, 2010; Edmans, 2011; Falato et al, 2013). Our study demonstrates that intangibles like firm's organization capital can have a significant influence on choice of auditor service which is a critical complementarity of corporate governance.

The structure of this study is as follows: Section 2 describes our theoretical framework and hypothesis development. Section 3 reports our research design, including measures for variables and empirical models. Section 4 reveals our empirical results, thus testing our hypothesis. Section 5 provides robustness tests. Section 6 concludes.

HYPOTHESIS DEVELOPMENT

What Is Organization Capital?

Organization capital is a type of intangible knowledge capital. To compete in knowledge-intensive business environment, intangibles are crucial to the success of the company (Zingales 2000; Edmans 2011). According to Prescott and Visscher (1980), a company can develop organization capital through investing in accumulated know-how that allows a company to match employees to projects and teams that suit them (e.g., through multistage interviews) and the human capital of the employees (e.g., through professional development workshops and training processes). Overall, organization capital helps firms to effectively utilize their human resources (Lev & Radhakrishnan 2005; Carlin et al. 2012).

Google, for instance, utilizes high-quality resources for multistage processes when searching for new employees. To make sure the new employee's talents match the needs of the project team, Google's hiring processes include numerous interviews, feedback, and screenings by diverse groups (Bock 2015). These multistage interviews help Google to better match potential new employees to projects and teams, thus increasing its organization capital. The accumulated expertise gleaned from the process is firm-specific information and thus cannot be easily copied by other firms.

Organization Capital and Auditor Choice

In this paper, we argue that organization capital might intensify the demand for high-quality audits because firms with more organization capital are likely to suffer from severe information asymmetry. We develop this argument by reviewing prior literature on intangibles. For example, Barth et al. (2000) indicates that firms with more intangible assets have more analyst coverage and that analysts make more effort to follow such firms, because intangible assets typically are unrecognized in firms' financial statements, and estimates of their fair values are not disclosed, firms with more intangible assets likely would have less informative prices without analyst coverage. Mohd (2005) examine the impact of the adopting of SFAS No.86, which requires the capitalization of certain software development costs on information asymmetry, and find that information asymmetry is significantly lower for firms that capitalize than for those who expense those costs, which is consistent with the logic that expensing creates ambiguity among investors about the value of intangibles, and thus increases the information asymmetry. Organization capital which is also reported as expenses that is hard to identify and track as they always refer to different items in income statement leads to the investors' lack of reliable information of the value of organization capital incorporated in their corporate valuation models (Lev and Radhakrishnan, 2005). Even for the financial analysts, the major information intermediaries in capital markets, fail to fully comprehend the value of firms' organization capital, because of the absence of relevant information on this resource in corporate financial reports (Lev and Radhakrishnan, 2005). Finally, according to implications by Stein (1989) and Edmans (2011), in general, firm outsiders have more difficulty evaluating the value of intangibles. Conversely, it is relatively easy for firm insiders to accurately value intangibles. Taken together, due to its intangibility, organization capital can exacerbate the information asymmetry between firm outsiders and insiders.

We focus on the information asymmetry channel because the importance of information asymmetry has been demonstrated in Healy and Palepu (2001): information asymmetry is one of the key drivers of demand for audit quality. The information asymmetry exacerbated by organization capital is problematic because information asymmetry between firm outsiders and insiders can induce a higher cost of capital. Firm outsiders, such as stock or debt investors, may consider a firm's investment in organization capital inefficient, thus demanding a higher rate of return. Consistent with the conjecture, Eisfeldt and Papaniklaou (2013) find that firms with more organization capital have average returns that are 4.6% higher than firms with less organization capital. To reduce this kind of upward pressure on cost of capital, firms with greater organization capital will have greater demand for high-quality audits. Since audits service is one of mechanisms to reduce agency costs associated with information asymmetry between managers and investors (Jensen and Meckling 1976), thereby reducing investor uncertainty and lowering perceived risk (Watts and Zimmerman 1986). Further, the benefit from auditing can be expected to vary

with the quality of the auditor. Studies using auditor brand name (Big N versus non-Big N) as a proxy for audit quality have documented lower IPO underpricing, larger earnings response coefficients, lower cost of capital for clients of Big N (Beatty 1989; Teoh and Wong 1993; Mansi et al. 2004; Khurana and Raman 2004). Another stream of literature that employs industry expertise as a proxy for audit quality also find positive market reaction to auditor changes when the successor auditor is an industry expert, positive association between auditor industry expertise and earnings quality, and negative relationship between auditors' industry expertise and cost of capital (Balsam et al. 2003; Knechel et al. 2007; Reichelt and Wang 2010; and Krishnan et al. 2013). Therefore, high-quality auditors who can more effectively facilitate the flow of firm-specific information to the financial market (Gul et al. 2010), is expected to be welcomed by firms with intensive organization capital, and our hypothesis is stated as follows: firms with greater organization capital are more likely to hire high-quality auditors.

RESEARCH DESIGN

Measure for Organization Capital

Following Eisfeldt and Papanikolaou (2013), we measure the value of organization capital by employing the following equation:

$$OC_{i,t} = (1- \delta)OC_{it-1} + SG\&A_{i,t}/CPI_t \quad (1)$$

In this equation, for each firm i and year t, OC represents the value of organization capital. δ stands for organization capital's constant depreciation rate. Consistent with the prior literature, we put 15% in δ. SG&A represents sales, general, and administrative (SG&A) expense. To account for annual inflations, SG&A is divided by consumer price index. In this model, the deflated flows from SG&A expenditure is considered as an inflow to organization capital considering that SG&A expense contains costs for human capital and relevant information such as employee wages, training cost, and consulting fees (Lev & Radhakrishnan 2005). We convert all missing data in SG&A to the value of zero. To complete Equation (1), it is necessary to measure the initial value of organization capital. According to the perpetual inventory method proposed by Eisfeldt and Papanikolaou (2013), each firm i's initial value of organization capital can be calculated by using the following equation:

$$OC_{i,0} = SG\&A_1/(g+ \delta) \quad (2)$$

g stands for the average real growth rate of SG&A. Consistent with Eisfeldt and Papanikolaou (2013), we put 10% in g. Then, we divide the organization capital by its book value of total assets (ORG_C) and use it in our regression equations.

Measures for Auditor Choice

We use two alternative proxies for auditor choice. Prior research argues that audit firms' size could be positively related to audit quality. Hence, Big 4 and non-Big 4 as the proxy for audit quality is widely used in auditing study (Copley & Douthett 2002; Wang et al. 2008). We also construct our first measure of auditor choice: AC1, equals 1 for firms audited by one of Big 4 firms (Deloitte, Ernst & Young, KPMG, or PricewaterhouseCoopers), and 0 otherwise. In addition, to respond Hay's (2013) call to use other proxies for audit firms' differentiation, we employ the likelihood to hire industry specialist auditor as another proxy for audit choice. Following Reichelt and Wang (2010) and Krishnan et al. (2013), we define an industry specialist auditor as the top-ranked audit firm by market share in audit fees for each two-digit Standard Industrial Classification (SIC) industry group.

Empirical Model

To empirically examine whether organization capital has a positive association with auditor choice, we conduct the following logistic regressions:

$$AC1_{i,t} = \alpha + \beta ORG\_Ci,t + \lambda Controls_{i,t} + Year + Industry + \varepsilon_{i,t} \quad (3)$$

$$AC2_{i,t} = \alpha + \beta ORG\_Ci,t + \lambda Controls_{i,t} + Year + Industry + \varepsilon_{i,t} \quad (4)$$

where, for firm i and year t, AC1 equals to 1 if the firm is audited by one of Big 4 audit firms, 0 otherwise. AC2 equals to 1 if the firm is audited by one of industry specialist, 0 otherwise. ORG_C denotes organization capital scaled by total book value of assets. We expect that the coefficients of ORG_C are significant and positive.

To isolate the impact of organization capital, we control for potential determinants of auditor choice. Control variables (Controls) include firm size (SIZE), financial leverage (LEV), asset structure (INV), return on assets (ROA), sales growth ratio (GROWTH), financial loss (LLOSS), segment (SEG), current ratio (CURR), asset turnover (ATURN), and foreign operations (FOREIGN). The definitions of the variables are described in Appendix 1. We also include year fixed effects (Year) and industry fixed effects (Industry) in our regression.

EMPIRICAL RESULTS

Data and Descriptive Statistics

Our sample consists of U.S. listed companies for the period of 1996 to 2018. The audit related information is available in Audit Analytics. The data used to compute measure of organization capital and control variables are obtained from Compustat. To mitigate the effect of outliers, all continuous variables are winsorized at the 1 percent and 99 percent levels. After excluding financial firms and utility firms, the sample includes 60,748 firm-year observations with non-missing data for all variables for Equation (3) and Equation (4).

Table 1 reports the summary statistics of the two proxies of audit choices, the measure of organization capital and the control variables for the auditor choice regressions. The overall mean of AC1 is 0.687, which indicates that approximately 68.7% of observations recruiting Big 4 to conduct audit. Table 1 also reports that the percentage of observations to hire Industry Specialist is 21.0%. Therefore, the two definitions of audit choice yield different samples, which avoid bias of sample composition in the study. In addition, ORG_C is the measures of organization capital used in regression models of Equation (3) and Equation (4), and the mean values for the observation is 0.562. In terms of other variables included in Equations (3) and (4), like SIZE, ROA, LEV, SEG and FOREIGN, they are qualitatively comparable to those in the previous literature.

TABLE 1
STATISTIC DESCRIPTION FOR REGRESSION VARIABLE

Variables	N	Mean	Median	S.D.	P25	P75
AC1	60748	0.687	1.000	0.464	0.000	1.000
AC2	60748	0.210	0.000	0.408	0.000	0.000
ORG_C	60748	0.562	0.036	3.023	0.008	0.210
SIZE	60748	5.538	5.638	2.542	3.895	7.282
LEV	60748	0.323	0.180	0.763	0.014	0.369
INV	60748	0.110	0.065	0.130	0.004	0.169
ROA	60748	-0.272	0.022	1.657	-0.096	0.071
GROWTH	60748	0.236	0.071	1.015	-0.047	0.232
LLOSS	60748	0.406	0.000	0.491	0.000	1.000
SEG	60748	1.811	1.732	0.746	1.000	2.236
CURR	60748	2.722	1.880	3.244	1.184	3.095
ATURN	60748	1.105	0.895	0.865	0.519	1.439
FOREIGN	60748	0.325	0.000	0.468	0.000	1.000

All variables are defined in Appendix A.

Table 2 presents the Pearson Correlation among all the variables. The first two columns describe the relationship between the audit choice and the variable of organization capital and a series of control variables. The correlation between AC1 and AC2 is positive and significant, and the result is consistent with our expectation. However, the proxies of auditor choice are significantly negative with the variable of organization capital. Although that is converse with the hypothesis, we need further empirical results from regression which includes all control variables. Finally, auditor choice is significantly negative correlated with all other variables except for firm size (SIZE), number of segments (SEG) and number of foreign operation (FOREIGN).

TABLE 2
PEARSON CORRELATION

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)AC1	**1.000**												
(2)AC2	**0.330**	**1.000**											
(3)ORG_C	**-0.160**	**-0.059**	**1.000**										
(4)SIZE	**0.568**	**0.242**	**-0.352**	**1.000**									
(5)LEV	**-0.156**	**-0.053**	**0.519**	**-0.265**	**1.000**								
(6)INV	**-0.080**	-0.010	**-0.027**	**-0.086**	**-0.017**	**1.000**							
(7)ROA	**0.199**	**0.073**	**-0.669**	**0.390**	**-0.631**	**0.029**	**1.000**						
(8)GROWTH	**-0.064**	**-0.025**	**0.021**	**-0.088**	0.009	**-0.064**	**-0.035**	**1.000**					
(9)LLOSS	**-0.207**	**-0.086**	**0.160**	**-0.397**	**0.168**	**-0.070**	**-0.256**	**0.058**	**1.000**				
(10)SEG	**0.264**	**0.116**	**-0.138**	**0.457**	**-0.114**	-0.001	**0.144**	**-0.099**	**-0.169**	**1.000**			
(11)CURR	**-0.019**	**-0.018**	**-0.078**	**-0.091**	**-0.186**	-0.001	**0.097**	**0.026**	-0.010	**-0.058**	**1.000**		
(12)ATURN	**-0.106**	**-0.025**	**0.110**	**-0.168**	**0.084**	**0.381**	**-0.045**	**-0.059**	**-0.095**	**-0.094**	**-0.204**	**1.000**	
(13)FOREIGN	**0.189**	**0.070**	**-0.066**	**0.253**	**-0.066**	**-0.033**	**0.075**	**-0.037**	**-0.082**	**0.339**	**-0.020**	**-0.129**	**1.000**

Coefficients in bold indicate significance at P<0.10

Multivariate Results for Auditor Choice

Table 3 reports the results of the multivariate regression tests based on Equation (3) and Equation (4), and the T-values are clustered by firm (Rogers 1993). The results for two proxies of auditor choice are given in Column (1) and Column (2) respectively. In Column (1), the proxy for the auditor choice is AC1, that is between Big4 and Non-Big4. When the measure of auditor choice is AC1, the coefficient of organization capital (ORG_C) is 0.008 and significant at t-value of 10.07. This result indicates that firms with more organization capital are more likely to hire Big 4 as their exterior auditor. In Column (2), the proxy for the auditor choice is AC2, that is between Industry Specialist and Non-Industry Specialist. When the measure of auditor choice is AC2, we find that the coefficient of organization capital is 0.004 and significant at t-value of 8.17, which suggests that firms with more organization capital have higher possibility to hire industry specialist. In terms of control variables in Column (1) and Column (2), their coefficients are consistent with prior studies. For example, larger firms, and firms with lower ROA or exhibiting serious financial loss are more likely to have demand for high quality audit.

In summary, the findings from the preceding primary empirical analysis meet our expectation and are consistent with the hypothesis. The significantly positive coefficients on the measure of organization capital in Table 3 indicate that the more investment in the organization capital may enhance firms' information asymmetry which increases firms' demand for high quality audit conducted by Big 4 or industry specialist.

TABLE 3
STOCK LIQUIDITY AND AUDITOR CHOICE

Variables	AC1 (1)		AC2 (2)	
	Coef.	t-value	Coef.	t-value
ORG_C	0.008	10.07***	0.004	8.17***
SIZE	0.111	58.45***	0.043	22.43***
LEV	-0.014	-4.14***	-0.002	-0.78
INV	-0.148	0.00	0.001	0.04
ROA	-0.004	-2.46**	-0.003	-3.77***
GROWTH	-0.006	-3.42***	0.000	-0.07
LLOSS	0.020	3.33***	0.015	2.75***
SEG	-0.010	-1.82*	0.003	0.59
CURR	0.004	3.75***	0.001	1.52
ATURN	0.001	0.22	0.005	1.16
FOREIGN	0.039	4.96***	0.007	0.85
INTERCEPT	0.074	4.71***	-0.053	-3.80***
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
No. of Observations	60748		60748	
Adj. R^2	34.6%		7.4%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

ADDITIONAL TESTS

Effect of Client Firm Size on Big4 Choice

As noted in Table 3, and as might be expected, client firms' size is significantly associated with their decision to engage high quality audit services provided by Big4 or industry specialist. This together with the significantly positive correlation between AC1/ AC2 and SIZE reported in Table 2 motivates us to further investigate whether firm size is driving our results. Therefore, we partition the sample into three subsamples by client size, re-run the regression for each subsample, and the results of these regressions are presented in Table 4. In Panel A, the proxy of audit choice is Big4 and Non-Big4, and in Panel B, the proxy of audit choice is industry specialist and Non-industry specialist. The results in both panels indicate that the relation between organization capital and auditor choice is robust across clients with the small and median of firm size. Although the consistent result is not found in the subsample with large firm size, it just suggests that the prior results are not driven by clients with large firm size.

TABLE 4
EFFECT OF CLIENT FIRM SIZE ON AUDITOR CHOICE

Panel A: AC1 is the measure of auditor choice						
Variables	Q1: Small Size (1)		Q2: Median size (2)		Q3: Large Size (3)	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
ORG_C	0.009	11.14***	0.101	7.38***	-0.002	-0.08
SIZE	0.124	26.28***	0.159	16.66***	0.016	6.47***
LEV	0.003	0.86	-0.056	-2.81***	0.006	0.37
INV	-0.196	-4.44***	-0.182	-2.53***	0.003	0.06
ROA	-0.009	-5.79***	-0.034	-2.70***	0.006	0.32
GROWTH	-0.005	-2.46**	-0.008	-2.03**	-0.012	-2.24*
LLOSS	0.066	6.33***	0.023	2.48***	-0.016	-2.34**
SEG	0.021	1.67*	-0.006	-0.59	-0.003	-0.63
CURR	0.003	2.96***	0.004	2.17**	0.003	1.64
ATURN	-0.006	-1.07	0.012	1.19	0.008	1.50
FOREIGN	0.133	7.49***	0.035	2.69***	0.006	1.00
INTERCEPT	0.140	1.02	-0.061	-0.48	0.721	6.43***
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
No. of Observations	20256		20248		20244	
Adj. R^2	23.8%		11.7%		9.7%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

Panel B: AC2 is the measure of auditor choice						
Variables	Q1: Small Size (1)		Q2: Median size (2)		Q3: Large Size (3)	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
ORG_C	0.003	6.95***	0.031	2.13**	0.010	0.29
SIZE	0.035	13.62***	0.041	4.41***	0.036	4.78***
LEV	0.002	1.12	-0.038	-1.99*	0.001	0.01
INV	-0.046	-1.82*	0.024	0.34	0.055	0.49
ROA	-0.002	-3.89***	0.027	2.41***	-0.012	-0.45
GROWTH	-0.001	-0.41	0.003	0.86	-0.007	-1.22
LLOSS	0.025	3.85***	0.028	2.93***	-0.003	-0.24
SEG	-0.005	-0.73	0.007	0.70	0.003	0.32
CURR	0.002	2.93***	0.002	1.43	-0.010	-3.07***
ATURN	0.001	0.39	-0.005	-0.55	0.017	1.21
FOREIGN	0.030	3.04***	0.022	1.75*	-0.003	-0.17
INTERCEPT	0.018	0.38	0.919	11.94***	0.168	0.47
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
No. of Observations	20256		20248		20244	
Adj. R^2	5.9%		3.5%		3.5%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

Alterative Definitions of Industry Specialist

Besides the measure of Industry Specialist (e.g. AC2) already been used in the prior primary empirical test, the extant studies also adopt several other proxies for industry expertise. According to the literature, we use other two proxies of Industry Specialist and re-run the regression to test the sensitivity of our findings to the definition of industry expertise. In a similar way, the first measure of auditor industry expertise is still computed based on audit firms' market share in audit fees within industry groups classified by two-digit SIC codes as the computation of AC2. However, now the auditor is defined as an Industry Specialist if the auditor has a market share greater than 30% in a two-digit SIC category in a particular year. We use Specialist 1 to stand for it (Reichelt et al. 2010; Krishnan et al. 2013). In terms of the second proxy of Industry Specialist, the total number of clients of an audit firm is incorporated, and an auditor is defined as Industry Specialist if the auditor has the greatest number of clients in the industry (Balsam et al., 2003). We use Specialist 2 to stand for it. The results of our sensitivity analyses with the other two definitions of Industry Specialist are tabulated in Table 5. The coefficients of ORG_C in both Column (1) and Column (2) are positive and significant, which are consistent with the preceding primary results, and our hypothesis is further supported as well.

TABLE 5
ALTERNATIVE DEFINITIONS OF INDUSTRY SPECIALIST

Variables	Specialist1 (1)		Specialist2 (2)	
	Coef.	t-value	Coef.	t-value
ORG_C	0.003	7.01***	0.004	6.37***
SIZE	0.043	22.46***	0.041	18.56***
LEV	0.002	0.74	-0.011	-3.78***
INV	-0.020	-0.64	-0.089	-2.44***
ROA	-0.005	-5.05***	-0.002	-1.53
GROWTH	-0.002	-1.73*	0.000	0.05
LLOSS	0.018	3.28***	0.019	3.07***
SEG	0.008	1.31	-0.024	-3.58***
CURR	0.000	0.17	0.003	2.83***
ATURN	0.010	2.69***	-0.005	-0.93
FOREIGN	0.010	1.31	0.007	0.79
INTERCEPT	-0.079	-5.71***	0.063	4.08***
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
No. of Observations	60748		60748	
Adj. R^2	13.3%		6.5%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

Effect of Enron/Andersen Scandal and SOX

During our sample period, the Enron/Andersen scandal occurred which affected the client firms' perceptions about the role, quality and credibility of external auditors. The Enron scandal eventually resulted in the collapse of Enron and the dissolution of Arthur Andersen, which was one of the five largest and most prestigious international accounting firms in the world. Numerous studies (Callen and Morel 2002, Asthana et al. 2003 and Cahan et al. 2009) show that the Enron-Andersen collapse has raised concerns about audit quality for other large auditors, and client firms may lose some confidence in other Big 4 auditors. Further, in response to this accounting scandal, SOX was enacted in 2002. The establishment of SOX results in more stringent standards for internal controls and auditing, and it also elevates the requirement of audit quality and increases auditors' accountability for client firms. Therefore, auditors who are capable to adapt this accounting revolution efficiently are in highly demand.

The illustration of Enron/Andersen scandal and SOX above reveals that the factors that facilitate firms' decision of auditor choice are different before and after SOX. However, as we mentioned, our observations in the sample are from both time periods, so we need investigate whether the link between organization capital and auditor choice is persistent before SOX and after SOX. We divide the sample into two groups by pre-SOX and post-SOX, run the regression respectively, and present the results in Table 6. Panel A reports the effect of SOX on the association between organization capital and auditor choice when the auditor choice is between Big4 and Non-Big4, and Panel B reports the results when auditor choice is measure by Industry specialist and Non-Industry Specialist. Except the coefficient of ORG_C in Column (1) of Panel A, others are significantly positive, which indicates that our findings are not subject to too much effect of SOX.

TABLE 6
EFFECT OF SOX ON THE RELATION BETWEEN ORGANIZATION CAPITAL AND AUDITOR CHOICE

Panel A: AC1 is the measure of auditor choice				
Variables	pre-SOX (1)		post-SOX (2)	
	Coef.	t-value	Coef.	t-value
ORG_C	0.006	1.24	0.008	10.40***
SIZE	0.071	15.87***	0.119	59.50***
LEV	-0.099	-4.80	-0.003	-0.90
INV	-0.059	-0.81	-0.176	-4.51***
ROA	-0.002	-0.27	-0.006	-4.03***
GROWTH	-0.005	-1.28	-0.008	-3.95***
LLOSS	0.053	3.68***	0.015	2.47***
SEG	-0.041	-3.21***	-0.008	-1.33
CURR	0.005	2.21**	0.005	4.10***
ATURN	-0.010	-0.91	0.002	0.33
FOREIGN	0.037	1.83*	0.059	7.28***
INTERCEPT	0.114	0.67	0.117	1.56
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
No. of Observations	6233		54515	
Adj. R^2	11.7%		41.4%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

Panel B: AC2 is the measure of auditor choice				
Variables	pre-SOX (1)		post-SOX(2)	
	Coef.	t-value	Coef.	t-value
ORG_C	0.007	2.82***	0.003	7.77***
SIZE	0.044	11.63***	0.044	22.20***
LEV	-0.043	-2.95***	0.001	0.56
INV	0.048	0.87	-0.008	-0.24
ROA	0.000	0.04	-0.004	-4.45***
GROWTH	0.001	0.18	-0.002	-0.98
LLOSS	0.021	1.68*	0.013	2.29**
SEG	-0.021	-1.87*	0.005	0.83
CURR	0.001	0.50	0.001	1.63
ATURN	-0.010	-1.21	0.006	1.42
FOREIGN	0.043	2.14**	0.008	1.46
INTERCEPT	0.542	1.69*	-0.070	-1.29
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
No. of Observations	6233		54515	
Adj. R^2	6.4%		8.3%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

Effect of Financial Crisis Period

According to the preceding introduction, organization capital is embodied in firms by investing in a series of valuable intangibles, so the volume of organization capital is an investment decision of firms which will be affected by the financial constraints. During the financial crisis period, like the recent 2008-2010, some firms may suffer more financial constraints than others, or firms may suffer more financial constraints in the financial crisis period than in other periods, so firms' investment in organization capital may differ during the financial crisis period. Since our sample period covers 2008- 2010, to test the robustness of the findings, we conduct a separate analysis for the period from 2008 to 2010. The results tabulated in Table 7 are also consistent with the findings reported earlier.

TABLE 7
ORGANIZATION CAPITAL AND AUDITOR CHOICE IN FINANCIAL CRISIS PERIOD

Variables	AC1 (1)		AC2 (2)	
	Coef.	t-value	Coef.	t-value
ORG_C	0.008	6.74***	0.003	4.11***
SIZE	0.127	45.23***	0.043	15.25***
LEV	0.009	1.32	-0.002	-0.69
INV	-0.214	-3.65***	0.001	0.27
ROA	-0.008	-2.22**	-0.003	-3.26***
GROWTH	-0.003	-0.70	0.000	-0.83
LLOSS	0.032	3.12***	0.015	2.32**
SEG	-0.002	-0.29	0.003	0.61
CURR	0.004	2.48**	0.001	1.09
ATURN	0.005	0.75	0.005	1.21
FOREIGN	0.069	5.64***	0.007	0.27
INTERCEPT	-0.106	-4.43***	-0.053	-4.64***
Industry Fixed Effects	Yes		Yes	
Year Fixed Effects	Yes		Yes	
No. of Observations	10845		10845	
Adj. R^2	43.0%		9.1%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

Endogeneity Concern

Although the above tests have demonstrated a strong positive association between organization capital and various proxies for auditor choice, endogeneity is a concern in most empirical studies and this one is no exception. One of the main concerns is from the possible omitted variables. There might be unobservable factors that lead to the preceding positive associations between organization capital and high quality audit not incorporated in our control variables in Equation (3) and Equation (4). We adopt the instrumental variable (IV) two-stage least squares approach to address this issue. Our choice of IV is based on the argument in Carlin et al. (2012), which suggests that firms in rapidly changing industries are less likely to invest in organization capital because such industries have a high risk of technology obsolescence that reduces the value of investment in organization capital. Following Li et al. (2014) and Francis (2015), we calculate the median value of the standard deviation of the seasonally adjusted quarterly asset growth rate for firms in the same two-digit SIC industry in year t to capture firm's growth uncertainty of the industry (Growth uncertainty). We also investigate whether this IV is correlated with auditor choice. After reviewing the literature, we don't find any documented evidence to indicate that Growth uncertainty is likely to be correlated with unobservable variables that affect firms' auditor choice.

Table 8 presents the results from the two-stage-least square regression analysis. The coefficient on Growth uncertainty in the first stage in column (1) is negative and significant, indicating a highly negative correlation between the IV and organization capital, which meets our expectation. The last two columns present the second stage regression by regressing the two proxies of auditor choice on the predicted component of organization capital (Pr_ORG_C) from the first stage respectively. Consistent with our primary earlier results, the coefficients on Pr_ORG_C are positive and significant, which suggests that the relation between auditor choice and organization capital is robust after controlling for endogeneity using a two-stage least squares specification.

TABLE 8
ORGANIZATION CAPITAL AND AUDITOR CHOICE (TWO-STAGE-LEAST SQUARES-REGRESSION)

Variables	ORG_C (1)		AC1 (2)		AC2 (3)	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Growth_uncertainty	-0.077	-4.23***				
Pr_ORG_C			0.789	4.22***	0.417	2.47***
SIZE	-0.054	-15.77***	0.141	13.64***	0.069	7.26***
LEV	-0.027	-0.79	-0.020	-1.23	-0.021	-1.33
INV	-0.282	-5.98***	-0.044	-0.63	0.120	1.92*
ROA	-0.624	-15.18***	0.440	3.77***	0.236	2.24**
GROWTH	-0.008	-1.47	0.013	3.68***	0.001	0.33
LLOSS	-0.059	-4.79***	0.055	4.30***	0.038	3.23***
SEG	-0.014	-2.52***	-0.005	-0.71	0.005	0.67
CURR	-0.005	-3.10***	0.008	4.56***	0.001	0.94
ATURN	0.075	6.91***	-0.054	-3.27***	-0.026	-1.70*
FOREIGN	0.012	1.55	0.013	1.57	0.004	0.41
INTERCEPT	0.499	18.5***	-0.194	-2.12**	-0.254	-3.07***
Industry Fixed Effects	Yes		Yes		Yes	
Year Fixed Effects	Yes		Yes		Yes	
No. of Observations	59876		57668		57668	
Adj. R^2	25.7%		22.6%		6.2%	

The t-statistics are in parentheses. *, **, *** denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed test). T-statistics based on standard errors clustered by a firm are shown in parentheses.

CONCLUSION

Firm-specific information, such as organization capital, is a crucial element for corporate decisions. To complement the audit literature by revealing an additional determinant of firm's audit choice, we argue that firms have intensive investment in organization capital are inclined to demand for high quality audit. Due to its firm-specific intangibility, organization capital may exacerbate the information asymmetry between firm outsiders and insiders, which can be problematic. Considering that high quality audit can effectively reduce information asymmetry, firms with greater organization capital will have greater demand for high-quality audit. Controlling for the effects of multiple variables, we find that companies with greater organization capital are more likely to hire Big 4 and Industry specialist. We continue finding supportive evidence even after considering the effects of firm size, SOX, and financial crisis. Our empirical finding is also robust in the tests using alternative measures of Industry specialist and addressing endogeneity concern. By investigating the role of organization capital in audit choice, our research contributes to broadening our horizons of understanding the importance of firm intangible resources in the process of firms' decision making.

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APPENDIX

VARIABLE DEFINITIONS

Variables	Definitions
AC1	1 if the firm audited by Big 4 audit firms (Deloitte, Ernst & Young, KPMG, or PricewaterhouseCoopers), and 0 otherwise
AC2	1 if the firm audited by Industry Specialist, and 0 otherwise
ORG_C	Organization capital divided by book value of total assets proposed by Eisfeldt and Papanikolaou (2013).
SIZE	Firm size, measured by the natural logarithm of book value of total assets.
LEV	Book value of total debt scaled by book value of total assets.
INV	The ratio of inventory to total assets.
ROA	Return-on-assets ratio, estimated by net income divided by book value of total assets.
GROWTH	The sales growth ratio in the past year.
LLOSS	1 if the firm reports a negative income, and zero otherwise.
SEG	Square root of the number of segments disclosed.
CURR	Current ratio, defined as current asset divided by current liabilities
ATURN	Asset turnover, calculated by net sales divided by book value of total assets.
FOREIGN	1 if the firm has foreign operations, and 0 otherwise.