Narrow Diversification, Wide Diversification, and Audit Quality

Evidence from China

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Abstract

Purpose

Audit firm diversification can take many forms. Strategic management theory suggests that if the diversification has a narrow focus, it can have a positive effect on performance through knowledge spillover. However, if the diversification is too wide, the lack of economies of scope may cause an even negative impact on performance. In this study, we examine the effect of an audit firm's diversification strategy on audit quality.

Design/Methodology/Approach

Specifically, we test whether auditors can benefit from knowledge spillover in their area of specialization.

Findings

we find that the magnitude of discretionary accruals and the balance of below-the-line item are significant lower for clients from narrowly diversified area than those from a widely diversified area, suggesting a higher audit quality due to possible knowledge spillover. In addition, we find such benefits are more pronounced with clients with high earnings volatility.

Originality/Value

This study extends the studies on auditor industry specialization by examining the effect of audit firms' diversification on audit quality and assessing potential differences on audit quality between narrow and wide diversification.

I. Introduction

Strategic management theory suggests that diversification should have a positive impact on performance due to economies of scope and scale, market power effects, risk reduction effects, and learning effects (Geringer et al. 2000). If the diversification has a narrow focus and is across connected constituencies, it can have a positive effect on performance since different market and product areas can leverage the knowledge gained in the crossover (Rumelt 1974). However, if the diversification is too wide, it can have a negative impact on performance due to a lack of economies of scope in developing competencies (Palepu 1985).

Audit firm diversification can take many forms. An audit firm can diversify horizontally by adding clients from new industries or from new geographic locations. An audit firm can also diversify vertically by providing more services (i.e., tax compliance and planning, internal control review, or acquisition-related consultancy) to existing clients or by auditing a wide variety of clients within one industry. In this study, we focus on understanding the consequences of diversification in client industry membership on an audit firm's performance.

When an audit firm chooses to diversify its client industry membership, there could be two possible possibilities. On one hand, the audit firm can choose an industry closely related to its specialty area. For example, an audit firm specialized in the auto industry adds a news client from the auto supply industry. In such a narrow diversification, auditors can benefit from the knowledge spillover from their specialization area, thus enhancing the likelihood of detecting material misstatements and lowering risk of an audit failure. On the other hand, an audit firm can enter a new area unrelated to its industry specialization. For

example, an audit firm specialized in the auto industry adds a client from the oil and gas industry. This is a wide diversification which would improve the audit firm's growth and profitability, but also bring more exposure to risk and uncertainty in audit quality due to lack of specialized knowledge.

Using data from China, one of the largest and fastest growing emerging markets, we investigate whether the two distinct diversification strategies in clients' industry membership (i.e. narrow vs. wide diversification) have different effects on audit quality. Based on the industry index compiled by the Chinese Security Regulatory Commission (CSRC), we partition clients of an audit firm into three groups: clients in its specialization area, clients in an industry closely related to the specialization area, and clients in an industry unrelated to the specialization area.[1]

We use the magnitude of discretionary accruals as proxy for audit quality in our empirical tests. Using clients in the specialization area as the benchmark or default group, we regress the proxy for audit quality against two dummy variables: one representing narrow diversification and the other representing wide diversification. Consistent with prior literature, the test results show that the magnitude of discretionary accruals for clients in auditors' specialty areas is significantly lower than that for clients in the auditors' non-specialty areas. We further partition the non-specialty areas into narrow diversification and wide diversification areas and find the magnitude of discretionary accruals of clients in narrowly diversified areas is significantly lower than that of clients in widely diversified areas, suggesting possible benefits from knowledge spillover.

[1] The CSRC industry index was revised in 2012. Since our sample period covers 2002 to 2013, we adopt the old index in our empirical analysis.

Using below-the-line items as an alternative measure for audit quality, we find similar test results. There is no significant difference in below-the-line items between the clients in the specialty areas and the narrowly diversified areas. However, the total of below-the-line items for clients in narrowly diversified areas is significantly less than that for clients in widely diversified areas, indicating auditors' specialty knowledge spill-over to related areas and lower audit quality for clients in the total unrelated areas.

In an additional analysis, we explore the underlying factors that affect auditors' knowledge spillover and possibly could explain the difference in audit quality between the specialty areas and non-specialty areas. Specifically, we test the effect of earnings volatility on the above documented association between diversification strategy and audit quality. We find the decline in audit quality for clients in widely diversified area in comparison with clients in the specialty area is more pronounced for clients with more volatile earnings. However, we do not find any significant difference in audit quality between clients in the narrowly diversified areas and clients in the specialty area, whether the clients have high or low levels of earnings volatility. The result implies that the benefit of knowledge spill over from auditors' specialty area is more pronounced for clients with high accounting complexity.

This study contributes to the auditing literature in several ways. First, we extend the studies on auditor industry expertise by examining the effect of client industry diversification strategy on audit quality. The extant literature on auditor expertise generally examine the impact of the auditor's industry specialization on audit performance. Prior research has documented various benefits from the auditor's industry expertise in terms of higher audit quality (Balsam et al. 2003; Reichelt and Wang 2010), audit fee premium (Casterella et al. 2004; Huang et al. 2007), and market competitive edge (Knechel et al. 2007).

While prior research on auditor industry specialization focuses on auditor's performance in regard to that particular group of clients in the auditor's specialization area, our study examines the mixture and composition of the whole client portfolio that is a function of the auditor's client diversification strategy. Specifically, we examine the effect of client industry membership diversification on audit quality. We investigate whether the auditor's specialized expertise in their focus areas is portable to audit of clients in closely related industries (narrow diversification) and to audit of clients in other unrelated industries (wide diversification) and whether the knowledge spillover could help improve audit quality. Moreover, we assess potential differences on audit quality between the narrow and wide diversification.

Second, we document factors such as accounting complexity that could possibly affect auditors' knowledge spill-over and cause the lower audit quality for clients in non-specialty areas than clients in the specialty area. Third, by including local firms in our sample and relaxing the requirement of the Big 4 audit firms, we provide evidence on audit quality in emerging market and examine the generality of the diversification effect. [2]

The remainder of this paper is organized as follows: Section II provides a literature review. Section III presents background information and hypotheses development. Section IV provides discussions on empirical research design. Section V presents the results of our empirical analysis. Section VI concludes the paper.

[2] The attributes of the audit office have drawn a great deal of attention in recent auditing research (i.e., Francis and Yu 2009; Choi et al. 2010; Fung et al. 2012; Francis et al. 2013). However, due to lack of access to Chinese audit firms' office level data, we only performed our analysis at the audit firm level rather than the office level. This is a limitation for this study.

II. Literature Review

Diversification

Diversification strategy is an important component of strategic management for a firm, and the relationship between a firm's diversification and its economic performance is an issue of considerable interest to both academics and managers (Palepu 1985). Similar to companies in other industries, accounting firms also take on some form of diversification to support growth and profitability.

According to the resource-based theory, scope economies (Teece 1982) and economic quasi-rents from shared strategic capabilities (Mahoney and Pandian 1992; Peteraf 1993; Teece, Pisano, and Shuen 1997) are asserted to generate sustainable competitive advantage and higher performance (Barney 1991). However, the academic evidence on the effect of diversification is somewhat mixed.

Prior research (Gort 1962; Arnould 1969; Markham 1973) find that firms' profitability is not significantly associated with the level of diversification. Geringer et al. (2000) examine the impact of product and international diversification on Japanese multinational firms' performance from 1977 to 1993. They find that product diversification has a weak impact on performance in only one period, whereas international diversification has negative consequences on profitability and positive effect on growth (Geringer et al. 2000).

By adopting a categorical measure of diversification, Rumelt (1974) finds firms that diversify but restrict their range of activities to a central skill or competence have shown better performance than other types of firms. Palepu (1985) finds no significant association between a firm's diversification and its growth. After partitioning related from unrelated

diversification, Palepu (1985) finds firms with predominantly related diversification have a higher growth rate than firms with predominantly unrelated diversification. Some researchers (Zhao and Luo 2002; Boz et al. 2013) argue that related diversification is superior to unrelated diversification because unrelated diversification may frustrate businesses due to the difficulty of applying existing experience to unfamiliar market conditions. Although related diversification can extract synergy benefits, Gary (2005) demonstrates that these benefits may be wiped out if management's implementation strategy does not maintain adequate shared resources. The relationship between diversification and firm's performance could be nonlinear (Lubatkin & Chatterjee, 1994) and follows an inverted U shape (Rumelt 1982).

In summary, the literatures from industrial organization and strategic management imply that the effect of diversification should be assessed through the relevance of its relatedness, rather than diversification *per se*.

Effect of Auditor Industry Specialization

Industry specialization is an opposite strategy that auditors can take to develop competitiveness and maximize their profitability. For audit firms, human capital is a firm's "most important resource" (Hitt et al. 2001). The auditor carries and generates the knowledge encoded in the services being offered and develops relationships with clients critical for a sustained flow of work (Greenwood 2005). Casterella et al. (2004) view industry specialization as a differentiation strategy that provides a substantial competing advantage to

auditors. Most importantly, the differential services provided by specialist auditors are valued by clients.[3]

Accounting researchers suggest that audits performed by industry specialists have relatively higher quality than ones performed by non-specialists, because audit specialists have resources, industry-specific knowledge, and incentives to better constrain clients' opportunistic accounting actions. Specialist auditors are likely to spend more on recruiting, training, and technologies. They are likely to share some best practices and industry-specific knowledge among their peers, helping them perform audits more effectively, thus improving audit quality.

Balsam et al. (2003) find that specialist auditors can provide better assurance on financial statements and ensure more compliance with audit standards. Reichelt and Wang (2010) find that joint national and city-specific industry specialists have the highest audit quality and they attribute this quality premium to auditor's national network synergies and individual auditor's deep industry knowledge. Lim and Tan (2010) also document that firms audited by specialists have relatively higher audit quality with extended auditor tenure.

Knechel et al. (2007) suggest that clients may switch auditors due to quality reasons, notwithstanding the desire to pursue clean opinions. Moreover, market values such change by reacting positively when clients switch from Big 4 non-specialist to Big 4 specialist, and negatively vice versa. Though Frankel et al. (2002) concerns that the provision of non-audit

[3] Accounting researchers (i.e., Casterella et al. 2004; Huang et al. 2007) have documented audit fee premium associated with industry specialization. Carson (2009) finds that audit fee premium is consistently associated with global specialist auditors, regardless whether the auditors are national specialists. Focusing on city-level auditor specialization, Fung et al. (2012) also documents significant specialization premium in both pre- and post- SOX periods.

service will decrease audit quality, Lim and Tan (2008) find that due to reputation concerns, fear of litigation risk, and benefits from knowledge spillover, audit quality may not be impaired if the audit is performed by an industry specialist.

On other hand, when matching specialist and non-specialist auditors based on client characteristics, Minutti-Meza (2013), however, find no significant differences in audit quality between these two groups. He argues that these findings do not imply that industry specialization is not important, rather that current methodology may not fully capture the effect of industry specialization. Particularly, he suggests that client size significantly influence the association between audit specialization and audit quality.

Background and Hypothesis Development

The accounting profession in China is much younger and inexperienced compared to most western countries (Lin et al. 2000). The desire for cross listing of China's big state-owned enterprises overseas, the convergence to international accounting and auditing standards, and the growth of foreign investment in China all lead to a high demand for auditing expertise. However, the availability of such accounting expertise is quite limited and inconsistent across the country.

After China joined the World Trade Organization (WTO), the massive foreign direct investment and huge initial public offerings (IPO) by domestic companies have made China a battleground for business. Like many other industries, audit firms also have their own plans for expansion. The expansion, on one hand, increases a firm's profitability through a larger client base and more service fees. On the other hand, it raises such concerns as whether audit

firms have adequate resources and expertise to support such fast expansion, especially when such expansion causes a horizontal diversification in industry membership.

Casterella et al. (2004) argue that industry specialization is essentially a differentiation strategy, which provides auditors a sustainable advantage to compete with their rivals. Diversification strategy is the opposite of differentiation strategy. Diversification of one's client industry membership aims at improving a firm's growth and profitability through attracting clients from new industries or markets. If the diversification has a narrow focus and is across connected constituencies, it can have a positive effect on performance since the different market and product areas can leverage knowledge gained from each other (Rumelt, 1974). However, if the diversification is too wide, it can have a negative impact on performance due to the lack of economies of scope in developing competencies (Palepu 1985).

In the current study, we examine whether different diversification strategies (narrow vs. wide) on client industry membership leads to different effects on audit quality. To address this question, we propose the following hypothesis:

H_1: *Audit quality for clients whose industry is closely related to a firm's specialization area (narrow diversification) is significantly higher than that for clients whose industry is not related to a firm's specialization area (wide diversification).*

In addition, we also attempt to explore the factors that affect the effect of auditors' knowledge spillover and underlie the relationship between diversification and audit quality. Specifically, we investigate whether auditors' specialty knowledge spillover is more effective in enhancing the audit quality of firms with higher accounting complexity than other firms.

III. Research Design

Measurement of audit quality

In this study, we use absolute value of discretionary accruals (*/DAC/)* as a proxy for audit quality. Researchers frequently use measures of discretionary accruals in tests for earnings management and market efficiency (Kothari et al. 2005). The majority of such studies use either the Jones model (Jones 1991) or the modified Jones Model (Dechow et al. 1995) to measure discretionary accruals. However, when applied to stratified-random samples of firms, both the Jones model and the modified Jones model are severely misspecified. Kothari et al. (2005) argue that accruals of firms that have experienced unusual performance are expected to be systematically nonzero, and therefore firm performance is correlated with accruals (Jones et al. 2008). Following Kothari et al. (2005), we include a performance control variable, return on assets (ROA), in the modified Jones model to measure discretionary accrual:

$$TA_{i,t} = \beta_0 + \beta_1(1/AT_{i,t-1}) + \beta_2 (\Delta REV_{i,t} - \Delta AR_{i,t}) + \beta_3 PPE_{i,t} + \beta_4 ROA_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where, *TA* is total accrual, calculated as the difference between net income before extraordinary items and operating cash flows, deflated by lagged total assets. *AT* is total assets at the beginning of the year, *ΔREV* is change in sales deflated by lagged total assets, *ΔAR* is change in accounts receivable deflated by lagged total assets, *PPE* is gross property, plant, and equipment deflated by lagged total assets, and *ROA* is return on assets, calculated as the ratio of income before extraordinary items to lagged total assets.

Discretionary accruals (DAC) are calculated as the difference between reported total accruals and fitted values of nondiscretionary accruals using coefficient estimates from model (1). We estimate model (1) for each industry and year, and we delete an industry if

there are fewer than ten observations in the industry-year. Here, industry is defined based on the first three digits of the industry index.

Measure of Auditor Industry Specialization, narrow diversification and wide diversification

The China Securities Regulatory Commission (CSRC) issued a five-digit industry index for Chinese public firms in the year 2001. In this industry index, the first three digits capture the general similarity among industries. For example, under the category of insurance (I11), I1101 is for life insurance, I1110 is property insurance, I1115 is for reinsurance, and I1199 is for other insurance. Based on this five-digit industry index, we classify clients of an audit firm into three groups: clients from an audit firm's specialized areas (SPECIAL), clients from its narrow diversified areas (NARROW), and clients from its wide diversified areas (WIDE).

In order to make this classification, we need to first identify the auditor industry specialization. Auditor industry specialization is not a readily observable attribute. Researchers have developed a variety of ways to define an auditor industry's specialization (Balsam et al. 2003; Francis et al. 2005; Knechel et al. 2007; Francis and Yu 2009). The most common proxy defines auditor industry specialization based on market share, with annual market shares calculated based on audit fees, total sales, or the number of clients. This method is based on the assumption that industry expertise is built by repetition in similar settings and therefore a large market share of a particular industry indicates industry specialization. We defined an auditor as an industry specialist if the auditor's market share in the client's 5-digit industry index exceeds 24%. An auditor's market share in an industry is

measured as the yearly audit fees earned by an auditor for an industry, divided by the total audit fees earned by all auditors serving that particular industry.

Then, clients who have the same first three digits in industry code as the clients in the auditor's specialization industry are categorized as clients in the narrow diversification area. Conversely, clients who do not share these same first three digits in the industry code as the clients in the auditor's specialization industry are categorized as clients in the wide diversification group. For example, if Cotton Textile Industry (C1105) is the specialized area for the audit firm, industries with the same first three digits such as Raw Fabric Mills (C1101), Wool Textile Industry (C1110), Knitting Product (C1125) and Other Textile (C1199) are considered as the narrow diversification area and industries without the same first three digits such as Paper Product (C3110), Printing (C3500) and Cultural and Education Goods Manufacturing (C3701) are considered as the wide diversification area.

Model specification

To examine the effect of auditor industry diversification on audit quality, we use the following model:

$$/DAC/= \beta_0 + \beta_1 NARROW + \beta_2 WIDE + \beta_3 LOGAT + \beta_4 TFEE + \beta_5 LEV + \beta_6 LAGLOSS + \beta_7 GROWTH + \beta_8 SOE + \beta_9 CROSSLIST + \beta_{10} BIG4 + \beta_j YDUMMY + \varepsilon \quad (2)$$

The dependent variable, */DAC/* in model (2), is the absolute value of discretionary accrual, a proxy for audit quality. The test variables of interest are *NARROW* and *WIDE*. *NARROW* is coded one if client's industry is closely related to the auditor's specialized industry, that is, the first three digits of industries are same. *WIDE* takes a value of one if a client's industry is not closely related to the auditor's specialized industry, that is, the first

three digits of both industries are not the same. We expect β_1 and β_2 to be positive and that β_2 is greater than β_1, confirming the hypothesis that audit quality of auditor industry specialists is greater than that of auditors with narrow diversification, whereas audit quality of auditors with narrow diversification is greater than that of auditors with wide diversification.

Following prior research (DeFond and Jiambalvo 1994; Burgstahler and Dichev 1997; Wang et al. 2008), we include various control variables in model (2) to capture the effects of other factors that may potentially affect discretionary accruals. The variable *LOGAT* controls for the size effect. We do not make a prediction as to the sign of *LOGAT,* because Burgstahler and Dichev (1997) and Barton and Simko (2002) indicate that firms with larger size are more likely to manipulate earnings to increase earnings or meet or beat analysts' forecasts. On the other hand, size is also a proxy for potential political costs. Han and Wang (1998) find that firms with higher political costs are less likely to engage in earnings management. The variable *TFEE*, the natural logarithm of total fees including audit and non-audit fees, is included to capture the audit firm size effect on audit quality. Francis and Yu (2009) find that audit quality is higher on average in larger audit firms due to greater in-house experience in administering the audits of public companies. The variable *LEV,* the ratio of debt to total assets, reflects incentives to manage earnings to avoid violating debt covenants (DeFond and Jiambalvo 1994). The variable *LAGLOSS* is used to control for financial conditions, because financially difficult firms are more likely to manage earnings (DeFond and Jiambalvo 1994). *Growth* accounts for high-growth firms that tend to have higher accruals (Warfield et al. 1995). A dummy variable (*SOE*) equal to 1 if the firm is state-owned is included to control the effect of governmental intervention, especially the influence from state-owned enterprises. China's stock and audit markets have been subject to

strong government influence since they emerged (Chan et al. 2010). Wang et al. (2008) found that local state-owned enterprises have greater incentive to hire low-quality auditors not to increase efficiency, but to meet CSRC's earning's target for IPO. A dummy variable *CROSSLIST* is included to capture the potential effect of cross listing on earnings and audit quality, because cross listing, especially in the countries with higher financial reporting standards or stronger institutional environment, increases a firm's earnings quality. A dummy variable *BIG4* is used to control the effect of auditor brand names on audit quality, because brand name auditors, in fear of reputation loss or litigation risk, have incentives to better constraint a client's aggressive reporting practice, thus providing a better assurance on the credibility of financial statements. Last, dummy variables are included to control for year fixed effects.

IV. Results

We retrieve all our data from the China Securities Markets and Accounting Research Database (CSMAR). We begin with all firms listed on the Shanghai and Shenzhen Stock Exchanges with industry indexes available from the year 2002 to year 2013, starting from 22,748 firm-year observations. After eliminating observations that do not have sufficient data for constructing key regression variables, and observations audited by auditors who have no specialization areas, we obtain a final sample of 3,108 firm-year observations. Details of the sampling process are shown in Table 1.

< *Insert Table 1 Here* >

Table 2 presents descriptive statistics for the pooled sample. The mean value for dummy variable *NARROW* is 0.0679 and the mean value for dummy variable *WIDE* is 0.7915. The mean values of *NARROW* and *WIDE* imply that, on average, audit firms in our

sample have 6.79% of their clients whose industry is closely related to the firm's specialization area and 79.15% of their clients whose industry is not related to the firm's specialization area. The difference between one and the sum of *NARROW* and *WIDE* is the percentage of clients from a firm's specialization area. In this case, about 14.06% of clients in our sample are audited by industry specialists. Also in our sample, about 7.95% (mean *SOE*=0.0795) of clients are state-owned firms, 15.28% (mean *CROSSLIST*=0.1528) of clients also issue B shares or H shares to foreign investors, and 9.81% (mean *BIG4*=0.0981) of clients are audited by Big 4 audit firms. The mean (median) absolute value of discretionary accruals (*/DAC/)* is 0.0762 (0.0428).

< *Insert Table 2 Here* >

Table 3 displays the correlation matrix for the key variables used in our analysis. /*DAC*/ is negatively and significantly correlated with the indicator for narrow diversification, but positively and significantly correlated with the indicator for wide diversification. /*DAC*/ is also positively and significantly correlated with leverage and incidents of loss in the previous period, but negatively and significantly associated with natural logarithm of total assets, natural logarithm of audit fees, growth opportunity, and the indicator for cross listing.

< *Insert Table 3 Here* >

In Panel A of Table 4, we first compare the absolute value of discretionary accrual (*/DAC/)* between an auditor's specialty area and that of areas closely related to (*NARROW*) the auditor's specialization area. Then we compare the */DAC/* of areas closely related to (*NARROW*) the auditor's specialization area and that of areas not closed related to (*WIDE*) the auditor's specialty. The mean and median /DAC/ for specialty area are 0.0431 and 0.0328. The mean and median /DAC/ for narrowly diversified area are 0.0490 and 0.0406.

The t-test shows that the difference on the mean (0.0059) between specialty area and narrowly diversified area are statistically significant at 10% level. The mean and median /DAC/ for widely diversified area are 0.0844 and 0.0458. When compared against the narrowly diversified group, the difference on the mean (0.0354) between narrow and wide is statistically significant at 1%.

To test H1, we estimate model (2) for the pooled sample. The results are in Table 4, Panel B. Notably, the coefficient for *NARROW* (β_1) is positive and significant (0.0195, p-value=0.0202) and the coefficient for *WIDE* (β_2) is positive and significant (0.0349, p-value<0.001) as well. The positive and significant coefficients for *NARROW* and *WIDE* imply that industry specialization improves audit quality through lower magnitude of discretionary accruals. This result is consistent with prior literature. However, our main research question for this study is to compare the audit quality between narrowly and widely diversified groups. To examine this question, we compare the coefficients between *NARROW* and *WIDE*. The regression result shows a difference on coefficients of 0.0154 and this difference is significant at 5% (p=0.0325). This result provides some support for the H1 that the magnitude of discretionary accrual for clients whose industry is closely related to a firm's specialization area (narrow diversification) is significantly lower than that for clients whose industry is not related to a firm's specialization area (wide diversification), suggesting a higher audit quality[4]. The signs of the coefficients on the control variables are generally in the predicted direction.

< *Insert Table 4 here* >

V. Robustness Tests

[4] Besides using the absolute value of DA as dependent variable, we also tried original value of DA, and subsample firms with either positive DA or negative DA. We get similar results as our primary analysis documented in Table 4.

To ensure our results robust, we use a matched sample to rerun model 3:

$$/DAC/= \beta_0 + \beta_1 WIDE + \beta_2 LOGAT + \beta_3 TFEE + \beta_4 LEV + \beta_5 LAGLOSS + \beta_6 GROWTH + \beta_7 SOE + \beta_8 CROSSLIST + \beta_9 BIG4 + \beta_j YDUMMY + \varepsilon \quad (3)$$

In this regression, we first identify the narrowly diversified group and, for each observation in this group, we match it to both the specialist group and the widely diversified group based on size and performance. The final sample has a total of 422 observations for each matching group. Table 5 presents the results of a robustness analysis. As shown in Panel A, we find that the magnitude of discretionary accruals for narrowly diversified firms is still significantly higher than that of firms audited by industry specialists. This result is consistent with prior research. The main focus of this paper is to compare the magnitude of discretionary accruals between narrowly and widely diversified groups. As presented in Panel B, we find that the coefficient for WIDE is positive and significant (0.0194, p=0.0036). This result reaffirms the findings in Table 4 that the magnitude of discretionary accrual is significantly lower for the narrowly diversified group than it is for the widely diversified group.

< Insert Table 5 here >

Then we use an alternative measure, below-the -line item (*BL),* to proxy for audit quality and run model 4:

$$BL = \beta_0 + \beta_1 NARROW + \beta_2 WIDE + \beta_3 LOGAT + \beta_4 TFEE + \beta_5 LEV + \beta_6 LAGLOSS + \beta_7 GROWTH + \beta_8 SOE + \beta_9 CROSSLIST + \beta_{10} BIG4 + \beta_j YDUMMY + \varepsilon \quad (4)$$

The adoption of below-the-line items is motivated by previous studies which find that Chinese firms tend to inflate earnings by timing the execution of transactions pertaining to

below-the-line items (Chen and Yuan 2004; Haw et al. 2005). These transactions are often dubious related-party transactions and attract much attention from regulators and investors (Gul et al. 2013). *BL* is calculated as sum of investment net income, profits from other operations, and non-operating net income, scaled by total assets. As shown in Table 6, we find that the coefficient for WIDE is positive and significant (0.0036, p=0.0057), while the coefficient for NARROW is not significant. We compare the coefficients between *NARROW* and *WIDE*. The regression result shows a difference on coefficients of 0.005 and this difference is significant at 1% (p=0.0046). This result provides additional support for the H1 that the balance for below-the-line item for clients whose industry is closely related to a firm's specialization area (narrow diversification) is significantly lower than that for clients whose industry is not related to a firm's specialization area (wide diversification), suggesting higher audit quality.

< *Insert Table 6 here* >

VI. Additional Analysis

In this section, we examine how earnings volatility affects the above documented association between firms' diversification type and audit quality. Specifically, we run model (5):

$$/DAC/= \beta_0+ \beta_1 NARROW+ \beta_2 NARROW*COMP+ \beta_3 WIDE+ \beta_4 WIDE*COMP + \beta_5 COMP+ \beta_6 LOGAT + \beta_7 TFEE+ \beta_8 LEV+ \beta_9 LAGLOSS + \beta_{10} GROWTH + \beta_{11} SOE+ \beta_{12} CROSSLIST+ \beta_{13} BIG4+ \beta_j YDUMMY+ \varepsilon \quad (5)$$

Earnings volatility (COMP) is calculated as the standard deviation of the ROA for the most recent five years. We find that for firms that are closely related to the auditor's specialty area

(NARROW), there is no significant difference on the audit quality as compared to auditor's specialty area (NARROW=0.0113, P=0.5091), even when earnings are very volatile (NARROW*COMP=0.0534, P=0.8821). However, for firms that are not closely related to the auditors' specialty areas (WIDE), we find the magnitude of discretionary accrual is significantly higher (WIDE=0.0353, P<0.0001), and this difference is more pronounced when earnings are more volatile (WIDE*COMP=0.1110, P=0.0014). This result implies that the benefit of knowledge spill over from auditors' specialty area is more effective in improving audit quality for clients with more volatile earnings and thus higher accounting complexity. The finding provides more insights on the underlying factors that affect the relationship between auditor specialization expertise and audit quality.

VII. Conclusion

Diversification has been a topic in strategic management for years. This study examines the relationship between audit quality and a firm's diversification on client industry membership. Consistent with prior literature, we find that the magnitude of discretionary accruals of clients in auditors' industry specialty area is much lower than that of a non-specialty area. When further partitioning the non-specialty area into two groups, the area with industry groups closely related to the auditor's specialty area (or narrowly diversified area) and the area with industry groups not closely related to auditor's specialty area (or widely diversified area), we find that the magnitude of discretionary accruals and the balance of below-the-line item are significant lower for clients from narrowly diversified area than those for clients from a widely diversified area, suggesting a possible benefit from knowledge

spillover. In addition, we find such benefit is more pronounced for clients with more volatile earnings and thus higher accounting complexity.

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Table 1: Sample selection

	Number of Observations
Firm-year observations with available industry code on CSMAR during 2002-2013	22,748
Less:	
Observations with missing audit fee information	(2,207)
Observations from industries with less than 10 firms	(7,051)
Observations audited by auditors who have no specialized areas	(6,843)
Observations with missing values in control variables	(3,735)
Final sample	3,108

Table 2: Descriptive statistics

Variables	25th Percent.	Mean	Median	75th Percent.	Std. Dev.
/DAC/	0.0186	0.0762	0.0428	0.0856	0.1048
BL	0.0029	0.0179	0.0089	0.0220	0.0263
COMP	0.0172	0.0602	0.0297	0.0568	0.1169
NARROW	0.0000	0.0679	0.0000	0.0000	0.2516
WIDE	1.0000	0.7915	1.0000	1.0000	0.4063
LOGAT	20.8532	21.7931	21.6169	22.6005	1.2269
TFEE	18.0839	18.4959	18.5650	19.1503	0.8343
LEV	0.3245	0.5433	0.5299	0.7332	0.2836
LAGLOSS	0.0000	0.0772	0.0000	0.0000	0.2670
GROWTH	0.2614	0.4836	0.4204	0.6359	0.2924
SOE	0.0000	0.0795	0.0000	0.0000	0.2705
CROSSLIST	0.0000	0.1528	0.0000	0.0000	0.3599
BIG4	0.0000	0.0981	0.0000	0.0000	0.2975

Table 3: Correlation Matrix

	/DAC/	NARROW	WIDE	BL	COMP	LOGAT	TFEE	LEV	LAGLOSS	GROWTH	SOE	CROSSLIST	BIG4
/DAC/	1.0000	-0.0699	0.1524	0.1066	0.0932	-0.0641	-0.1249	0.1852	0.0854	-0.1148	0.0058	-0.0608	-0.0051
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7463)	(0.0007)	(0.7750)
NARROW	-0.0351	1.0000	-0.5258	-0.0478	-0.0072	-0.0527	0.1831	-0.1213	0.0034	-0.0112	-0.0415	0.0560	-0.0374
	(0.0501)		(0.0000)	(0.0069)	(0.7389)	(0.0033)	(0.0000)	(0.0000)	(0.8504)	(0.5335)	(0.0208)	(0.0018)	(0.0369)
WIDE	0.1151	-0.5259	1.0000	0.0856	0.0359	-0.1134	-0.0044	0.0499	0.0150	-0.0465	-0.0044	-0.0550	-0.0730
	(0.0000)	(0.0000)		(0.0000)	(0.0096)	(0.0000)	(0.8064)	(0.0054)	(0.4048)	(0.0095)	(0.8064)	(0.0022)	(0.0000)
BL	-0.0215	-0.0273	0.0790	1.0000	0.1918	-0.0813	-0.0046	-0.0626	0.0577	-0.0845	-0.0351	-0.0028	0.0133
	0.2231	0.1231	(0.0000)		(0.0000)	(0.0000)	(0.7934)	(0.0004)	(0.0011)	(0.0000)	(0.0451)	(0.8743)	(0.4522)
COMP	0.0421	-0.0030	-0.0119	0.0636	1.000	-0.1506	-0.0378	-0.0531	0.2373	-0.2261	0.0542	-0.0517	-0.0873
	(0.0508)	(0.8884)	(0.5795)	(0.0032)		(0.0000)	(0.0791)	(0.0136)	(0.0000)	(0.0000)	(0.0118)	(0.0162)	(0.0000)
LOGAT	-0.0669	-0.0570	-0.0935	-0.1287	-0.1162	1.0000	0.0789	0.3902	-0.0734	0.5564	0.1183	-0.1020	0.3872
	(0.0002)	(0.0015)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
TFEE	-0.0876	0.2097	-0.1758	-0.0343	-0.0181	0.0487	1.0000	-0.1391	-0.0298	0.0868	-0.2486	0.1094	-0.0242
	(0.0000)	(0.0000)	(0.0000)	(0.0526)	(0.4012)	(0.0067)		(0.0000)	(0.0971)	(0.0000)	(0.0000)	(0.0000)	(0.1781)
LEV	0.0997	-0.1223	0.0416	0.0794	0.2102	0.4232	-0.1524	1.0000	0.1142	0.0994	0.0822	-0.1932	0.1031
	(0.0000)	(0.0000)	(0.0205)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LAGLOSS	0.0447	0.0034	0.0150	0.1653	0.1125	-0.0767	-0.0218	0.1030	1.0000	-0.0553	-0.0048	-0.0157	-0.0225
	(0.0128)	(0.8504)	(0.4048)	(0.0000)	(0.0000)	(0.0000)	(0.2235)	(0.0000)		(0.0020)	(0.7898)	(0.3823)	(0.2099)
GROWTH	-0.1156	-0.0030	-0.0494	-0.1030	-0.1491	0.5082	0.1097	0.0933	-0.0830	1.0000	0.0805	0.0689	0.2940
	(0.0000)	(0.8668)	(0.0059)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0001)	(0.0000)
SOE	-0.0228	-0.0415	-0.0044	-0.0268	0.0703	0.1163	-0.2261	0.0761	-0.0048	0.0804	1.0000	0.0074	0.0950
	(0.2039)	(0.0208)	(0.8064)	(0.1290)	(0.0011)	(0.0000)	(0.0000)	(0.0000)	(0.7898)	(0.0000)		(0.6784)	(0.0000)
CROSSLIST	-0.0447	0.0560	-0.0550	-0.0305	-0.0628	-0.1203	0.1112	-0.1957	-0.0157	0.0481	0.0074	1.0000	0.0823
	(0.0126)	(0.0018)	(0.0022)	(0.0849)	(0.0035)	(0.0000)	(0.0000)	(0.0000)	(0.3823)	(0.0073)	(0.6784)		(0.0000)
BIG4	-0.0325	-0.0374	-0.0730	0.0155	-0.0800	0.3543	-0.0436	0.1109	-0.0225	0.2521	0.0950	0.0823	1.0000
	(0.0701)	(0.0369)	(0.0000)	(0.3801)	(0.0002)	(0.0000)	(0.0151)	(0.0000)	(0.2099)	(0.0000)	(0.0000)	(0.0000)	

Two-tailed *p*-values are presented in parentheses. See the Appendix for the definition of variables.

Table 4: Results of the impact of diversification on audit quality

Panel A: Absolute value of discretionary accruals

	Specialty	Narrow	Difference	Narrow	Wide	Difference
Mean	0.0431***	0.0490***	0.0059*	0.0490***	0.0844***	0.0354***
Median	0.0328***	0.0406***	0.0050**	0.0406***	0.0458***	0.0052

Panel B: Multivariate analysis

$$/DAC/= \beta_0 + \beta_1 NARROW + \beta_2 WIDE + \beta_3 LOGAT + \beta_4 TFEE + \beta_5 LEV + \beta_6 LAGLOSS + \beta_7 GROWTH + \beta_8 SOE + \beta_9 CROSSLIST + \beta_{10} BIG4 + \beta_j YDUMMY + \varepsilon$$

Variables	Coefficient	P-value	VIF
INTERCEPT	0.1056**	0.1884	0.0000
NARROW	0.0195**	0.0202	1.4461
WIDE	0.0349***	<.0001	1.4638
LOGAT	-0.0091***	<.0001	2.1794
TFEE	0.0049	0.1693	2.8488
LEV	0.0746***	<.0001	1.3165
LAGLOSS	0.0205***	0.0022	1.0420
GROWTH	-0.0160**	0.0497	1.8516
SOE	-0.0069	0.3207	1.1431
CROSSLIST	-0.0025	0.6262	1.0966
BIG4	0.0105	0.1099	1.2401
YDUMMY		YES	
WIDE-NARROW	0.0154**	0.0325	
Adjusted R^2		13.10%	
N		3,108	

See the Appendix for the definition of variables.

Table 5: Robustness analysis: using the matched samples

Panel A: Match narrow firms with firms audited by specialist

Variables	Coefficient	P-value	VIF
INTERCEPT	0.0034	0.9786	0.0000
NARROW	0.0089**	0.0130	1.0293
LOGAT	-0.0032	0.1974	2.3395
LEV	0.0181**	0.0352	1.4154
LAGLOSS	0.0011	0.8752	1.0755
GROWTH	-0.0205**	0.0257	1.8803
SOE	-0.0026	0.8234	1.3639
CROSSLIST	0.0085*	0.0701	1.1506
BIG4	0.0017	0.8515	1.4925
YDUMMY	YES		
Adjusted R^2	4.13%		
N	422		

Panel B: Match narrow firms with wide firms

Variables	Coefficient	P-value	VIF
INTERCEPT	0.3974***	0.0002	0.0000
WIDE	0.0194***	0.0036	1.0445
LOGAT	-0.0168***	0.0002	2.2167
LEV	0.0622***	<0.0001	1.4369
LAGLOSS	0.0135	0.2351	1.0760
GROWTH	0.0086	0.6177	1.8324
SOE	0.0029	0.8773	1.1371
CROSSLIST	0.0035	0.6915	1.1479
BIG4	-0.0396	0.1024	2.9970
YDUMMY	YES		
Adjusted R^2	13.56%		
N	422		

See the Appendix for the definition of variables.

Table 6: Robustness analysis: Using below-the-line items as an alternative measure of audit quality

$$BL = \beta_0 + \beta_1 NARROW + \beta_2 WIDE + \beta_3 LOGAT + \beta_4 TFEE + \beta_5 LEV + \beta_6 LAGLOSS + \beta_7 GROWTH + \beta_8 SOE + \beta_9 CROSSLIST + \beta_{10} BIG4 + \beta_j YDUMMY + \varepsilon$$

Variables	Coefficient	P-value	VIF
INTERCEPT	0.0621***	0.0009	0.0000
NARROW	-0.0014	0.4866	1.4447
WIDE	0.0036***	0.0057	1.4919
LOGAT	-0.0039***	<.0001	2.0785
TFEE	0.0016**	0.0433	2.1860
LEV	0.0090***	<.0001	1.2795
LAGLOSS	0.0142***	<.0001	1.0492
GROWTH	-0.0004	0.8201	1.8212
SOE	-0.0020	0.2740	1.1396
CROSSLIST	-0.0021	0.1047	1.1090
BIG4	0.0080***	<.0001	1.2310
YDUMMY		YES	
WIDE-NARROW	0.0050***	0.0046	
Adjusted R^2		6.70%	
N		3,108	

See the Appendix for the definition of variables.

Table 7: Additional analysis: Explore the effect of accounting complexity on audit quality

$$/DAC/= \beta_0 + \beta_1 NARROW + \beta_2 NARROW*COMP + \beta_3 WIDE + \beta_4 WIDE*COMP + \beta_5 COMP + \beta_6 LOGAT + \beta_7 TFEE + \beta_8 LEV + \beta_9 LAGLOSS + \beta_{10} GROWTH + \beta_{10} SOE + \beta_{11} CROSSLIST + \beta_{12} BIG4 + \beta_j YDUMMY + \varepsilon$$

Variables	Coefficient	P-value	VIF
INTERCEPT	-0.07077	0.5187	0.0000
NARROW	0.0133	0.5091	2.7135
*NARROW*COMP*	0.0534	0.8821	2.4185
WIDE	0.0353***	<.0001	1.4546
*WIDE*COMP*	0.1110***	0.0014	1.3961
COMP	0.0019	0.1518	1.1457
LOGAT	-0.0108***	0.0004	2.0286
TFEE	0.0148***	0.0017	2.1359
LEV	0.0790***	<.0001	1.2326
LAGLOSS	0.0056	0.5540	1.0761
GROWTH	-0.0001	0.9924	2.0051
SOE	-0.0055	0.6021	1.1412
CROSSLIST	-0.0174*	0.0948	1.1509
BIG4	0.0108	0.271	1.2226
YDUMMY		YES	
Adjusted R^2		15.30%	
N		2,158	

See the Appendix for the definition of variables

APPENDIX: Variables used in the model

Variables		Definition
Dependent variables:		
BL	=	Sum of investment net income, profits from other operations, and non-operating net income, scaled by total assets.
/DAC/	=	Absolute value of discretionary accrual, a measure of audit quality. Discretionary accruals are estimated from the following cross-sectional modified Jones (1991) model: $TA_{i,t} = \beta_0 (1/AT_{i,t-1}) + \beta_1 (\Delta REV_{i,t} - \Delta AR_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 ROA_{i,t} + \varepsilon_{i,}$ Where *TA* is total accrual, *AT* is total assets at the beginning of the year,*ΔREV* is change in sales deflated by lagged total assets, *ΔAR* is change in accounts receivable deflated by lagged total assets, *PPE* is gross property, plant, and equipment deflated by lagged total assets, and *ROA* is return on assets.
Independent variables:		
BIG4	=	1 if the firm is audited by one of the big4 audit firms, 0 otherwise.
COMP	=	Measured using the earnings volatility, which is the standard deviation of the ROA for the most recent five years.
CROSSLIST	=	1 if the firm issues shares to foreign investors (e.g., B shares or H shares), 0 otherwise.
GROWTH	=	Is the ratio of total common shareholder' equity to total market value.
LAGLOSS	=	1 if the firm reported a loss in the previous year, 0 otherwise.
LEV	=	Leverage ratio, defined as total liabilities divided by total assets.
LOGAT	=	The natural logarithm of total assets.
NARROW	=	1 if the firm's industry is closely related to its auditor's specialized industry, 0 otherwise.
SOE	=	1 if the firm is state-owned, 0 otherwise.
TFEE	=	The natural logarithm of total fees of the audit firm including audit and non-audit fees.
WIDE	=	1 if the firm's industry is not closely related to its auditor's specialized industry, 0 otherwise.
YDUMMY	=	Year dummies.