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公司多角化、分擔責任查核意見與應計數品質之關係*

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摘要

本研究旨在探討營運多角化對於公司盈餘品質之影響以及當主查會計師因無法直接查核重大轉投資公司而出具分擔責任之查核意見時，是否會使多角化公司之盈餘品質趨於惡化。本研究區別跨國多角化與產業多角化兩種型態，並提出兩組互競假說—資訊不對稱假說與應計數抵銷假說。研究結果發現，對於主查會計師出具分擔責任意見之受查公司，若其跨國多角化程度愈高，則其應計數品質愈差，但產業多角化對於應計數品質並無顯著的不利影響。此外，若主查會計師可以直接查核所有重大轉投資公司而出具無保留意見，則跨國多角化對於應計數品質之負面影響會趨於緩和。本研究結果顯示，跨國多角化程度高且重大轉投資公司未經主查會計師查核之公司，負面之資訊不對稱效果凌駕了正面之應計數抵銷效果，其盈餘品質堪虞。再者，有效外部審計之監督力量以及產業多角化之應計數抵銷效果，均有助於減緩跨國多角化對於應計數品質之負面影響。

關鍵詞：跨國多角化、產業多角化、應計數品質、分擔責任意見

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Corporate Diversification, Shared Audit Opinion, and Accruals Quality

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Abstract

We examine whether corporate diversification deteriorates earnings quality and whether the audit scope limitation due to material subsidiaries or affiliate investments not audited by the principal auditor (as proxied by shared audit opinion) exacerbates the earnings quality problem for diversified firms in Taiwan. We make an explicit distinction between *global* diversification and *industrial* diversification. We find that after controlling the level of industrial diversification, greater *global* diversification deteriorates accruals quality for diversified firms that receive shared audit opinions. However, the adverse effect of global diversification on accruals quality will be mitigated if the principal auditor of diversified firms can directly audit all material subsidiaries or affiliated companies (as proxied by standard unqualified audit opinion). There is weak evidence which shows that after controlling the level of global diversification, greater *industrial* diversification may ameliorate the accruals quality problem for diversified firms receiving shared opinions. Our study suggests that the unobservability of material foreign subsidiaries or affiliate investments by the principal auditor impairs the audit quality and provides empirical support for recent regulatory reforms to enhance the transparency of financial disclosure and strengthen the auditors' responsibilities for globally diversified firms.

Keywords: *Industrial diversification, Global diversification, Accruals quality, Shared opinion.*

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1. INTRODUCTION

Globalization makes the world flat. But globalization also makes the business world more complex and less transparent. For business enterprises in Taiwan, which has been well-known for its export-driving economy and successful OEM/ODM business models developed by the highly concentrated electronic industry, global diversification and industrial diversification have been the typical business strategy to achieve cost efficiencies, diversify business risks and search for growth opportunities. According to the survey of our study, at the end of year 2004, there are over 72% of Taiwan listed and over-the-counter (hereafter OTC) firms that operate abroad (i.e., global diversification) and over 62% that operate across multiple industrial sectors (i.e., industrial diversification)[1]. However, since many blatant accounting frauds involve diversified corporations (e.g., Enron in U.S. and Infodisc Technology in Taiwan), critics often argue that corporate diversification complicates the organizational structures and thus increases the difficulty of monitoring and makes the financial statements less transparent. The audit scope limitation with respect to material subsidiaries or affiliate investments further exacerbates the problem of financial reporting quality for diversified firms. These concerns for corporate diversification call forth recent regulatory actions to enhance the transparency of financial disclosure and strengthen the auditors' responsibilities for diversified firms.

Whether corporate diversification enhances or destructs firm value has been a continuing debate in the literature. The diversification discount of diversified firms has been documented in a number of studies for the last decade (e.g., Lang and Stulz 1994; Berger and Ofek 1995; Servaes 1996). One popular explanation for the diversification discount is based on agency theory. For example, the empirical evidence in Berger and Ofek (1995) shows that the agency costs of diversification is higher than the coordination and economies of scope benefits arising from diversification. The source of agency costs for diversified firms comes from the separation of ownership and control and the information asymmetry between top management and divisional managers. One outcome of such agency problem is the potential adverse effect of diversification on earnings quality (hereafter referred as the negative *information asymmetry* effect). Recently, Demirkan, Radhakrishnan

[1] These figures are based on the data taken from the Business Affiliates Operations Profile database of TEJ. We calculate the number of industrial segments by identifying the industry in which each subsidiary or affiliate company operate and calculate the number of countries where the firm operate by identifying the country each subsidiary or affiliate company locates in. Alternatively, if we use the segment reporting data disclosed on the financial statement footnotes, there are over 19% of Taiwan listed and OTC firms disclosing multiple industrial segment financial data and over 25% disclosing sales data from different foreign geographic areas.

and Urcan (2006) find that the diversification discount is associated with the lower earnings quality of multiple-segment firms. However, the impact of diversification on earnings quality may not be as straightforward as it appears. Jiraporn, Kim and Mathur (2005) find that earnings management is mitigated in industrially diversified firms but global diversification alone does not appear to impact earnings management. They argue that diversified firms derive their cash flows from disparate business divisions and thus the accruals generated by these business divisions are imperfectly correlated and tend to offset each other at the entire firm's level, making it difficult for managers to manage earnings considerably in either direction (hereafter referred as the positive *offsetting accruals* effect). Therefore, it is still an unresolved empirical issue that whether corporate diversification improves or impairs earnings quality and whether global diversification and industrial diversification have different impacts on earnings quality.

Another factor that contributes to the earnings quality problem of diversified firms is the audit scope limitation due to the unobservability of material subsidiaries or affiliate investments by the principal auditor. Modified unqualified audit opinion due to material subsidiaries or affiliate investments audited by other auditors (hereafter referred as shared opinions) has been the most common type of modified unqualified audit opinion in Taiwan. Based on our survey, among Taiwan listed and OTC firms over the period from 1999 to 2004, there were over 30% of firms receiving shared opinions. Besides, among those firms receiving modified unqualified audit opinions, there are over 76% involving audit scope limitation due to affiliate investments unaudited by the principal auditor. Since accounting irregularities involving affiliate investments often had received such type of modified audit opinions, critics call for the regulatory agency to take actions to strengthen the auditor's responsibility for affiliate investments. As part of the responses to the critics, the regulatory agencies of both the Taiwan Security Exchange (TSE) and Gre-Tai Security Market (GTSM) recently revised their supervisory rules for listed and OTC firms. The revised rule, which is effective in 2006, specifies that firms receiving shared opinions with the proportion of affiliate investments audited by other auditors deemed to be material will be selected by the supervisory agency as high risk firms and included in the list of critical documentary review and subject to follow-up by exception. In consequence of these regulatory actions, the principal auditor may be forced to expand their audit scope and it is reasonable to expect that audit costs may increase considerably which in turn will increase the audit fees and the costs of financial reporting. Although the regulatory actions seem logical by intuition, it needs more rigorous empirical evidences to justify these costly regulatory actions.

In this study, we examine whether corporate diversification deteriorates earnings quality and whether the audit scope limitation due to material subsidiaries or affiliate investments not audited by the principal auditor (as proxied by shared audit opinion) exacerbates the earnings quality problem for diversified firms in Taiwan. We make an explicit distinction between *global* diversification and *industrial* diversification. We find that after controlling the level of industrial diversification, greater *global* diversification deteriorates accruals quality for diversified firms that receive shared audit opinions. We also find that the adverse effect of global diversification on accruals quality will be mitigated if the principal auditors of diversified firms can directly audit all material subsidiaries or affiliated companies (as proxied by standard unqualified audit opinion). Beside, there is weak evidence which shows that after controlling the level of global diversification, greater *industrial* diversification may ameliorate the accruals quality problem for diversified firms receiving shared opinions. The results for global diversification demonstrate that the negative information asymmetry effect dominates the positive offsetting accruals effects for globally diversified firms. However, the results for industrial diversification suggest that the positive offsetting accruals effect mitigates the negative information asymmetry effect for industrially diversified firms. It implies that firms operating in different industries are likely to derive cash flows that are not perfectly correlated and thus it may be more difficult for managers to manage earnings in either direction, as accruals in different industrial business units tend to offset each other (Jiraporn et al. 2005). It is also consistent with some recent empirical work that finds that gains from country diversification have been decreasing relative to industrial diversification due to increasing economic and financial integration across countries (e.g., Dumas, Harvey and Ruiz 2003; Carrieri, Errunna and Sarkissian 2005). Our study also suggests that the effective monitoring by external auditor helps to mitigate the information asymmetry problem but the unobservability of material subsidiaries or affiliate investments by the principal auditor impairs audit quality for globally diversified firms.

Our study contributes to the accounting literature in various ways. First, we extend the earnings quality literature by investigating the impacts of corporate diversification on accruals quality. Second, we make an explicit distinction between industrial diversification and global diversification and demonstrate that these two types of diversifications may have different implications for earnings quality. Although partly consistent with the existing literature (e.g., Jiraporn et al. 2005), our study provides additional findings that complement to the previous work. Finally, we contribute to the auditing literature by demonstrating that audit scope limitation with respect to affiliate investments exacerbates the earnings quality

problem for globally diversified firms and provides empirical supports for the regulatory policy to enhance the transparency of financial disclosure and the auditor's responsibility for foreign subsidiaries and affiliate investments.

The rest of this paper is organized as follows: Section II presents a literature review and develops the research hypotheses. Section III explains the research design and sample selection. The empirical results are shown and discussed in Section IV, and Section V provides some concluding remarks.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 CORPORATE DIVERSIFICATION AND ACCRUALS QUALITY

There are two competing perspectives in the literature about the impacts of corporate diversifications on earnings quality. For example, Jiraporn et al. (2005) suggest two competing hypotheses that potentially explain the relation between the degree of corporate diversification and earnings quality. One is referred as the information asymmetry hypothesis and the other is the so-called offsetting accruals hypothesis.

Based on the *information asymmetry* hypothesis, diversification creates a complex organizational structure that increases the degree of information asymmetry and the difficulty of monitoring. For multi-industry firms, combining diverse operations from different industrial sectors creates information aggregation problems that can result in substantial information asymmetries within the firm or between firm insiders and outside investors by suppressing the activities of information intermediaries (Habib, Johnsen and Naik 1997; Gilson, Healy, Noe and Palepu 2001; Bushman, Chen, Engel and Smith 2004). While diversified firms must disclose segment data in Taiwan, this information can suffer from problems associated with segment identification, cost allocation, and transfer pricing schemes (e.g., Givoly, Hayn and D'Souza 1999). For multinational firms, organizational complexities can arise as firms act to arbitrage institutional restrictions such as tax codes and financial restrictions (Bodnar, Tang and Weintrop 1998; Cahan, Rahman and Perera 2005). For example, globally diversified firms may employ complex transfer pricing schemes to shift profits to low tax jurisdictions that can make foreign operations less transparent and too complex to be understood by shareholders and board members. Information complexities also arise from geographic dispersion, multiple currencies, high auditing costs, different legal systems, and cultural and language differences (Reeb, Kwok and Baek 1998; Duru and Reeb 2002; Denis, Denis and Yost 2002). Besides, since the internal agency

problem is more severe in diversified firms than single-segment or domestic firms, diversified firms are more likely to compensate their divisional managers based on observable performance measures such as accounting earnings (Healy and Palepu 2001; Lambert 2001; Bushman and Smith 2001; Demirkan et al. 2006). Thus, managers in diversified firms can also have higher incentives to manage earnings. As a result, managers in diversified firms may have both more latitude and higher incentives to exploit the information asymmetry and engage in a larger degree of opportunistic earnings management which in turn deteriorate earnings quality.

The proposition of information asymmetry hypothesis is derived based on the premise that corporate diversification increases the degree of information asymmetry. However, opposite views have been proposed in the literature that argue that diversified firms could ease information asymmetries between the firm insiders and outside investors by using internal capital markets to allocate resources more efficiently, diversify income flows to avoid inefficient bankruptcies, and exploit economies of scope (e.g., Williamson 1970; Lewellen 1971; Gertner, Scharfstein and Stein 1994; Stein 1997). Besides, multi-industry firms derive cash flows from different industrial segments which are likely not perfectly correlated. Similarly, multinational firms are also exposed to country-wide economic or political factors that are also not perfectly correlated. Therefore, it may be more difficult for managers to manage earnings in either direction, as the accruals in different business units tend to offset each other. As a result, in contrast with the information asymmetry hypothesis, the *offsetting accruals* hypothesis posits that corporate diversification improves but not impairs earnings quality.

We recognize that both the information asymmetry effect and the offsetting accruals effect may exist at the same time and the observed outcome will be determined by which effect dominates in equilibrium. Ultimately, it is an empirical issue to be resolved.

2.2 SHARED AUDIT OPINION AND EARNINGS QUALITY

For diversified firms, there are three possible types of audit opinions which are largely determined by the audit scope of the principal auditor with respect to subsidiaries and affiliate investments. The first type is standard unqualified opinion in which no reference is made to other auditors. This type of opinion is given when other auditors audited an immaterial portion of the financial statements, other auditors are well known or closely supervised by the principal auditor, or the principal auditor has thoroughly reviewed the other auditors' work. The second type is called the shared opinion in which the principal auditor gives an unqualified opinion with modified wording to make reference to other auditors. This type of

opinion is appropriate when it is impractical to review the work of other auditors or when the portion of the financial statements audited by other auditors is material in relation to the whole. The third type is qualified opinion which is required if the principal auditor is not willing to assume any responsibility for the work of other auditors or some other auditor qualified his or her portion of the audit (Arens, Elder and Beasley 2006)[2]. Since qualified opinions due to affiliate investments unaudited by the principal auditor are rare in Taiwan, we combine those observations involving the last two types of opinions in this study and refer them as "shared opinion" for brevity[3].

The monitoring role of external auditing has been long time recognized in the literature (e.g., Chow 1982; Wallace 1987). According to the audit risk model, AR = IR × CR × DR, where AR=audit risk, IR=inherent risk, CR=control risk and DR=detection risk. Given the assessed combined level of inherent risk and control risk (i.e., IR×CR), the external auditor reduces the audit risk to an acceptable level by conducting the necessary audit work. Thus, effective audit will make the quality of audited financial statement less susceptible to the inherent risk and control risk. However, if the principal auditor issues shared opinions, then it generally implies that the portion of the financial statements audited by other auditors is material relative to the whole and it is not feasible for the principal auditor to review the work of other auditors or the reputation of other auditors is not good enough to be trusted by the principal auditor. Therefore, the audit risk associated with unaudited financial statement of affiliated companies cannot be reduced by the principal auditor and thus the accruals quality of the parent's or consolidated financial statements will be more susceptible to the inherent risk and control risk of corporate diversification.

Based on the arguments of information asymmetry hypothesis, greater corporate diversification deteriorates the information asymmetry problem and thus is susceptible to higher inherent risk and control risk. As a result, the combined

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[2] If the financial statements of material affiliate investments are unaudited by any auditors, the principal auditor often issues modified unqualified audit opinion or qualified opinion and the latter is more common. The principal auditor may issue a disclaimer of opinion if the limitation of audit scope is severe (Arens et al. 2006). Based on our survey, during the period from 1999 to 2004, there are no Taiwan listed and OTC firms ever receiving a disclaimer opinion due to material affiliate investments unaudited by the principal auditor. But we note that there is one listed firm receiving such type of audit opinion in 2006.

[3] Based o our survey, during the period from 1999 to 2004, among all Taiwan listed and OTC firms, there are only 23 firm-year financial statements accompanied by qualified audit opinions due to material affiliate investments unaudited by the principal auditor and without other qualified matters (6 cases due to material affiliate investments audited by other auditors and 17 cases due to financial statements of material affiliate investments unaudited by any auditors). However, among these 23 observations, only 7 observations meet our data requirements. All the results reported in this study remain substantially unchanged if we exclude these observations from our sample.

level of inherent risk and control risk (i.e., IR×CR) will get higher as the level of corporate diversification increases. When the principal auditor issues shared opinions, it generally implies that the portion of the financial statements audited by other auditors is material relative to the whole and it is not feasible for the principal auditor to review the work of other auditors. As a result, the principal auditor cannot reduce the audit risk associated with unaudited financial statements of affiliated companies to an accepted level, thus, based on the information asymmetry hypothesis, we expect that higher level of corporate diversification will be associated with inferior accruals quality for diversified firms receiving shared opinions. We develop our first hypothesis based on the information asymmetry hypothesis as follows.

H1a: (*The Information asymmetry hypothesis*) For diversified firms receiving shared audit opinions, greater corporate diversification will be associated with *inferior* accruals quality.

Based on the arguments of offsetting accruals hypothesis, corporate diversification will ease the information asymmetry problem and make earnings management more difficult as the accruals in different business units tend to offset each other. Therefore, greater corporate diversification will make accruals less noisy and less biased. As a result, the combined level of inherent risk and control risk (i.e., IR×CR) will be lower as the level of corporate diversification increases. When the principal auditor issues shared opinions, the combined level of inherent risk and control risk determines the residual risk associated with unaudited financial statements of affiliated companies, thus, based on the offsetting accruals hypothesis, we expect that accruals quality will be better as the level of corporate diversification increases for diversified firms receiving shared opinions. We develop another hypothesis based on the offsetting accruals hypothesis as follows and state it as the competing hypothesis to H1a.

H1b: (*The Offsetting accruals hypothesis*) For diversified firms receiving shared audit opinions, greater corporate diversification will be associated with *better* accruals quality.

Although the information asymmetry problem may create high inherent risk and control risk for highly diversified firms based on the information asymmetry hypothesis, external auditing may ameliorate the information asymmetry problem if the principal auditor can take an effective audit. As implied by the audit risk model, the principal auditor can mitigate the high level of (IR × CR) and reduce the audit

risk (AR) to an acceptable level by conducting the necessary audit work and thus reducing the level of DR. Therefore, although (IR × CR) may be positively associated with the level of corporate diversification based on the information asymmetry hypothesis, the positive association between AR and the level of corporate diversification may be attenuate or negligible if the principal auditor can take an *effective* audit. In consequence, based on the information asymmetry hypothesis, we expect that the adverse effect on accruals quality will be mitigated if the principal auditor issues standard unqualified opinions. We develop our next hypothesis based on the information asymmetry hypothesis as follows:

H2a: (*The Information asymmetry hypothesis*) The *adverse* effect of corporate diversification on accruals quality will be mitigated if the principal auditor of diversified firms issues *standard unqualified* audit opinion.

Based on the arguments of offsetting accruals hypothesis, the combined level of inherent risk and control risk (i.e., IR×CR) will be lower as the level of corporate diversification increases. As implied by the audit risk model, the principal auditor determines the planned level of DR based on the assessed level of (IR × CR). The combination of low (IR × CR) and high DR can produce the commensurate level of AR with the combination of high (IR × CR) and low DR if the audit scope is not significantly restricted. Therefore, although (IR × CR) may be negatively associated with the level of corporate diversification based on the offsetting accruals hypothesis, the negative association between AR and corporate diversification may be attenuate or negligible if the principal auditor has taken an effective and *efficient* audit. In consequence, based on the offsetting accruals hypothesis, we expect that the positive effect of corporate diversification on accruals quality will be attenuated if the principal auditor issues standard unqualified opinions. We develop our final hypothesis based on the offsetting accruals hypothesis as follows and state it as the competing hypothesis to H2a.

H2b: (*The Offsetting accruals hypothesis*) The *positive* effect of corporate diversification on accruals quality will be attenuated if the principal auditor of diversified firms issues *standard unqualified* audit opinion.

2.3 THE DIFFERENTIAL IMPACTS OF GLOBAL DIVERSIFICATION VS. INDUSTRIAL DIVERSIFICATION

Although we do not distinguish between global diversification and industrial diversification in the previous discussion, it is possible that the impacts of global diversification on accruals quality may be different from that of industrial

diversification. For example, the degree of information asymmetry and the difficulty of monitoring in industrially diversified firms may be different from that of globally diversified firms. The information asymmetry problem may be more severe for globally diversified firms than for industrially diversified firms because greater geographic dispersion requires more delegation to local managers and thus it would be more difficult for headquarter top manager to monitor highly disperse geographic segments. On the other hand, the lack of industry knowledge and experience by headquarter top manager may entail more delegation to unit managers responsible for individual industry sectors and make worse the information asymmetry between departmental managers and top manager. Therefore, it is ambiguous that whether global diversification or industrial diversification affects accruals quality more adversely from the information asymmetry perspective. However, it is less ambiguous to predict the relative contribution to accruals quality by global diversification versus industrial diversification from the perspective of offsetting accruals hypothesis. There are evidences in the literature that the correlation of cash flows from different countries is higher than that from different industries (e.g., Dumas et al. 2003; Carrieri et al. 2005). Therefore, the offsetting accrual effect may be more prominent for industrially diversified firms than for globally diversified firms. The finding of Jiraporn et al. (2005) that earnings management is mitigated in industrially diversified firms but global diversification alone does not impact earnings management is consistent with the explanation that the positive offsetting accruals effect dominates the negative information asymmetry effect for industrially diversified firms but the positive offsetting accruals effect mitigates and offsets the negative information asymmetry effect for globally diversified firms. However, since the evidence is not abundant in the literature and particularly scarce for studies using Taiwan’s data, we do not predict the relative impacts of global diversification and industrial diversification on accruals quality and leave it is an empirical issue to be resolved.

Similarly, we also recognize that the effect of audit scope limitation due to unaudited affiliate investments on accruals quality may be different for globally diversified firms and industrially diversified firm. If the positive offsetting accruals effect dominates the negative information asymmetry effect for industrially diversified firms as documented by Jiraporn et al. (2005), then industrial diversification may improve accruals quality. In such cases, the audit scope limitation may not constitute a serious concern for earnings quality because the inherent risk and control risk are moderate or low. Consequently, the audit scope limitation with respect to affiliate investments may not deteriorate accruals quality

for industrially diversified firms. However, if the negative information asymmetry effect dominates the positive offsetting accruals effect, then corporate diversification may deteriorate accruals quality before considering the contribution of external auditing. In such cases, effective external auditing will be crucial for earnings quality because the inherent risk and control risk are high. Therefore, the impacts of audit scope limitation on accruals quality may be different for globally diversified firms and industrially diversified firms if the combined level of inherent risk and control risk (IR×CR) is different between these two types of diversifications. Moreover, if the level of IR×CR is lower for industrially diversified firms than for globally diversified firms as implied by the evidence of Jiraporn et al. (2005), then the adverse impacts of audit scope limitation on accruals quality due to unaudited affiliate investments will be more severe for globally diversified firms than for industrially diversified firms. Since we cannot tell in prior which effect will dominate for each type of diversified firms in Taiwan, we leave it as an empirical issue and express the hypotheses in the way as stated above.

3. METHODOLOGY AND DATA

3.1 THE MEASURE OF ACCRUALS QUALITY

We employ the accrual estimation error measure developed by Dechow and Dichev (2002) (hereafter DD) and modified by McNichols (2002) and Francis, LaFond, Olsson and Schipper (2005) as our measure of accruals quality. In the DD model, accruals quality is measured by the extent to which working capital accruals map into past, current, and future operating cash flows. This model is predicated on the idea that, regardless of management intent, accruals quality is affected by the measurement error in accruals. Intentional estimation error arises from incentives to manage earnings, and unintentional error arises from management lapses and environmental uncertainty. However, the source of the error is irrelevant in this approach (Francis et al. 2005). Since the operational complexity created by diversified firms may increase both the inherent estimation errors and strategically earnings management, we believe that such measure will be most appropriate for our purpose. This accruals quality measure based on DD model gets very popular in recent empirical work (e.g., Francis et al. 2004, 2005; Demirkan et al. 2006; Doyle, Ge and McVay 2007). Specifically, our accruals quality metric is based on the cross-sectional DD model, augmented with the fundamental variables from the Jones model (Jones 1991; DeFond and Jiambalvo 1994) as suggested by McNichols

(2002)[4], i.e., the gross value of property, plant and equipment (PPE) and change in sales revenues:

$$TCA_{jt} = \beta_0 + \beta_1 CFO_{jt-1} + \beta_2 CFO_{jt} + \beta_3 CFO_{jt+1} + \beta_4 \Delta REV_{jt} + \beta_5 PPE_{jt} + \upsilon_{jt} \quad (1)$$

where TCA_{jt} = total current accruals in year t = $TA_{jt} + DEPN_{jt}$, TA_{jt} = total accruals = $NIBE_{jt} - CFO_{jt}$, $NIBE_{jt}$ =net income before extraordinary items in year t, CFO_{jt} =cash flow from operations in year t, $DEPN_{jt}$ =depreciation and amortization expense in year t, ΔREV_{jt} =change in sales revenues between year t-1 and year t, PPE_{jt} =gross value of PPE at the end of year t. All variables in equation (1) are scaled by average total assets over year t-1 and year t.

Following Francis et al. (2005), we estimate equation (1) cross-sectionally, by year and within each of the Taiwan Economic Journal (TEJ) industry classifications. If an industry group has less than ten observations in any given year, those observations pertaining to that industry are deleted[5]. Annual cross-sectional estimations of equation (1) yield firm and year-specific residuals, which form the basis for our accruals quality metric: $AQ_{jt} = -\sigma(\hat{\upsilon}_j)_t$ where $\sigma(\hat{\upsilon}_j)_t$ is the standard deviation of firm j's residuals, $\hat{\upsilon}_{jt}$, calculated over year t-4 through year t. For the convenience of interpretation, we multiplied $\sigma(\hat{\upsilon}_j)_t$ by (-1). Thus, larger AQ indicates better accruals quality.

3.2 THE MEASURE OF CORPORATE DIVERSIFICATION

We measure the degree of diversification based on two measures: one is based on the number of industrial segments or countries in which the firm and its affiliates operates and the other is based on a Herfindahl-type index. For industrial (global) diversification, the two empirical measures are represented by *LN_IND_DIV_NUM* (*LN_GLO_DIV_NUM*) and *IND_DIV_HERF* (*GLO_DIV_HERF*). *LN_IND_DIV_NUM* (*LN_GLO_DIV_NUM*) = the natural log of the number of industrial segments (countries) in which firm and its affiliates operates. We take natural log to take into account the potential nonlinear relationship. Higher value of *LN_IND_DIV_NUM* (*LN_GLO_DIV_NUM*) indicates higher level of industrial (global) diversification. The number of industrial segments (countries) is determined by calculating the

[4] McNichols (2002) augments the DD model by adding the two fundamental variables from Jones model. She argues that the change in sales revenue and PPE are important in forming expectations about current accruals, over and above the effects of operating cash flows. She shows that adding these variables to the cross-sectional DD model significantly increases its explanatory power, thus reducing measurement error.

[5] We require a minimum number of ten observations to estimate equation (1). Although many studies often require at least 20 observations, there are not uncommon to require a lower number of observations such as ten or less in the literature (e.g., Matsumoto 2002; Bowen, Rajgopal and Venkatachalam 2004; Cheng and Warfield 2005). Since the number of listed and OTC firms are small for some industries, we make a trade-off to balance the measurement error and the final sample size.

number of industries (countries) in which the firm and its affiliated companies operate. The second empirical measure is *IND_DIV_HERF* (*GLO_DIV_HERF*) = [the sum of the squares of each industrial segment's revenues (revenues from each country) as a percentage of the combined revenues from all industrial segment (from all countries)] multiplied by (-1) = $(-1)\times\sum(SSales/Sales)^2$ where SSales denotes each segmental revenues (revenues from each country) and Sales denotes the combines revenues from all segment (from all countries). Thus, for single-segment (domestic) firms, *IND_DIV_HERF* (*GLO_DIV_HERF*) = -1. For a two-segment firm (firm with one-foreign-subsidiary) with equal segmental revenues (equal revenues from each country), *IND_DIV_HERF* (*GLO_DIV_HERF*) = -0.5. For the consistency of interpretation with *LN_IND_DIV_NUM* (*LN_GLO_DIV_NUM*), we multiple the Herfindhl index by (-1) and thus higher value of *IND_DIV_HERF* (*GLO_DIV_HERF*) indicates higher level of industrial (global) diversification.

The measures of corporate diversification are constructed based on the data taken from the Business Affiliates Operations Profile (BAOP hereafter) database of TEJ. The BAOP database provides selected financial data of reported affiliated companies by Taiwan listed and OTC firms. We first identify the industry and country in which the parent company and each affiliated company operates, respectively, and then calculate the number of industrial sectors and the number of countries that the parent and all reported affiliated companies operate for each firm-year to derive the value of *LN_IND_DIV_NUM* and *LN_GLO_DIV_NUM*. Next, we collect the data of sales revenue of parent company and each affiliated company and reclassify them as sales from specific industry and sale from specific country by the industrial sector and the country in which the parent and each affiliate operate. Finally, we use the data of sales from each identified industry and sales from each identified country to derive the value of *IND_DIV_HERF* and *GLO_DIV_HERF*[6]. The way we construct our measures of corporate diversification are common in the literature (e.g., Denis, Denis and Sarin 1997; Rose and Shepard 1997; Bushman et al. 2004; Jiraporn et al. 2005).

Most U.S. studies use segment reporting data to construct the measure of corporate diversification. We use a different data source in this study because listed and OTC firms in Taiwan often disclose their segment reporting data in rather diverse ways and to our knowledge there are no financial database providers in Taiwan collecting segment reporting data. Since there are no standard classification schemes of industrial segment reporting, the coding of industrial segments by the

[6] Although the BAOP database provides the data of country registered by each reported affiliated company, it does not provide the identity of industrial sector for each affiliate. We thank for the helps from the staff of TEJ to provide the industry data we need.

researcher may be very subjective. For example, some companies may report three industrial segments but other companies may combine these three industrial segments as one broad industrial segment. Besides, the geographic segment reporting data often disclose sales from broad geographic areas such as Asia, America, America, Australia, etc., but the geographic dispersion within each continent area may be rather diverse. However, to be comparable with U.S. studies, we do hand collect the segment reporting data from the financial statement footnotes and use that data source to calculate alternative measures of corporate diversification as an additional test. The detail will be discussed in the later section.

3.3 THE CODING OF AUDIT OPINION

As we discuss in the section 2.2, there are three possible types of audit opinions for diversified firms which are largely determined by the audit scope of the principal auditor with respect to subsidiaries and affiliate investments. We use the variable *STD_OPINION* to denote the type of audit opinions. If the firm received standard unqualified opinion, then we code *STD_OPINION*=1. If the firm receives modified unqualified or qualified opinion due to affiliated companies audited by other auditors (i.e., shared opinions) or unaudited by any auditors, then we code *STD_OPINION* =0. To avoid the confounding effects, we exclude all modified unqualified opinion involving going concern problem. We also code *STD_OPINION*=1 if the firm receives modified unqualified opinion due to mandatory accounting changes and without other modified matters because this type of opinions do not imply audit scope limitations.

3.4 THE SPECIFICATION OF EMPIRICAL MODEL

We employ the follow regression model to test our hypotheses:

$$\begin{aligned} AQ_{jt} = {} & \beta_0 + \beta_1 GLO\_DIV_{jt} + \beta_2 IND\_DIV_{jt} + \beta_3 STD\_OPINION_{jt} \\ & + \beta_4 GLO\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_5 IND\_DIV_{jt} \times STD\_OPINION_{jt} \\ & + \beta_6 SPECIALIST_{jt} + \beta_7 O\_B_{jt} + \beta_8 DUALITY_{jt} + \beta_9 LEV_{jt} + \beta_{10} SIZE_{jt} \\ & + \beta_{11} SD\_SALE_{jt} + \beta_{12} SD\_CFO_{jt} + \beta_{13} OPERCYCLE_{jt} + \beta_{14} RD_{jt} + \beta_{15} LOSS_{jt} + \mu_{jt} \end{aligned} \quad (2)$$

The dependent variable of equation (2) is the accruals quality metric (AQ) as explained above. There are three test variables including the level of industrially diversification (*IND_DIV*), the level of global diversification (*GLO_DIV*), and the type of audit opinion with respect to subsidiaries and affiliate investments *(STD_OPINION). IND_DIV* = the level of industrial diversification, *IND_DIV* $\in$*(LN_IND_DIV_NUM, IND_DIV_HERF*); *GLO_DIV* = the level of global diversification, *GLO_DIV* $\in$*(LN_GLO_DIV_NUM, GLO_DIV_HERF),* both are explained in the Section 3.2. *STD_OPINION* equals 1 if it received standard

unqualified opinion, and equals zero if it received shared opinion as described in section 3.3. β_1 (β_2) represents the incremental effect of global (industrial) diversification on accruals quality for firms receiving shared opinions. $\beta_1+\beta_4$ and $\beta_2+\beta_5$ represents the incremental effect of global (industrial) diversification on accruals quality for firms receiving standard unqualified opinions. Based on H1, we predict that $\beta_1<0$ and $\beta 2<0$. Besides, based on H2, we predict that $\beta_4>0$, $\beta_5>0$. We do not predict the signs of $\beta_1+\beta_4$ and $\beta_2+\beta_5$. We expect $\beta_3>0$ because the direct audits by the principal auditor improves the audit effectiveness in general relative to the cases with audit scope limitations.

There are two sets of control variables in equation (2). The first set of control variables involve four corporate governance variables, including auditor's industry expertise (*SPECIALIST*), the divergence between ownership and control by the controlling shareholders (O_B), the duality of the chairman of board and CEO (DUALITY), and the leverage (LEV). The auditor's industry expertise is measured by auditor's market shares (based on the squared root of total assets) in its client's industry. Specifically, $SPECIALIST = \sum\sqrt{ASSET} / \sum\sum\sqrt{ASSET}$, where $\sum\sqrt{ASSET}$ is the sum of the squared roots of total assets for all the clients audited by the principal auditor in the particular industry, $\sum\sum\sqrt{ASSET}$ is the sum of the squared roots of total assets for all the list and OTC firms in the particular industry. This measure of auditor's industry specialization is common in the literature (e.g., Krishnan 2003; Balsam, Krishnan and Yang 2003). We expect that accruals quality will be positively associated with the level of auditor's industry expertise, thus we predict $\beta_6>0$. The divergence between ownership and control *O_B* is calculated as *OWNERSHIP/BOD_CONTROL*, where *OWNERSHIP* represents the cash flow rights owned by the controlling shareholders and *BOD_CONTROL* represents the proportion of seats of board of directors controlled by the controlling shareholders. The incentive effect of cash flow rights held by controlling shareholders has been documented in the literature (e.g., Claessens, Djankov, Fan and Lang 2002). Higher ownership aligns the interests between controlling shareholders and minority shareholders and enhances the quality of financial reporting (e.g., Fan and Wong 2002). The entrenchment effect of board affiliation has been documented in the corporate governance literature (e.g., Yeh and Woidtke 2005). Since higher *O_B* implies lower divergence between ownership and control, we predict $\beta_7>0$. *DUALITY* is set to one if the chairman of the board takes the position of CEO and zero otherwise. The duality of chairman of board and CEO has been recognized as a weakness of corporate governance (e.g., Core, Holthausen and Larcker 1999; Sharma 2004). We expect accruals quality will be worse if the chair of board also takes the position of CEO, thus we predict $\beta_8<0$. Leverage (*LEV*) is measured as the

total liabilities to total assets ratio. Consistent with prior empirical work (e.g., DeFond and Jiambalvo 1994; Minton and Schrand 1999), we argue that firms have incentives to exercise accounting discretion either to avoid covenant violations or to prevent adverse impacts on their debt rating. As a result, we predict $\beta_9<0$. The second set of control variables include the innate economic factors suggested by Dechow and Dichev (2002) and Francis et al. (2004, 2005) that affect accruals quality, including firm size (*SIZE*) which is measured by the natural log of total assets, standard deviation of sales revenues (*SD_SALE*) over the period from year t-4 to year t, standard deviation of cash flow from operations calculated over the period from year t-4 to year t (*SD_CFO*), natural log of the length of operating cycle (*OPERCYCLE*), R&D intensity calculated as *R&D* expenses divided by sales revenues (*RD*), and the incidence of negative earnings realizations over the past five years (*LOSS*). We expect all these innate factors except for the *SIZE* are negatively associated with accruals quality.

3.5 DATA AND SAMPLE SELECTION

The sample is selected from Taiwan listed and OTC non-financial firms over the period from 1999 to 2004. Because *AQ* is calculated based on five annual residuals, our sample is restricted to firms with financial data of at least 7 consecutive years[7]. The financial data are collected from both the parent and consolidated financial database of TEJ[8]. Corporate diversification data are developed based on the data from the Business Affiliates Operations Profile database of TEJ as described in section 3.2. Three corporate governance variables including *BOD_CONTROL*, *OWNERSHIP* and *DUALITY* are collected from the Corporate Governance database of TEJ. The auditor and audit opinion data are collected from the Auditor Attestation Records database of TEJ. We construct two samples, one is based totally on the financial data from separate financial statements of parent companies (the *parent* sample hereafter) and the other replaces the parent financial data by consolidated financial data if the parent company prepares consolidated financial statements (the *consolidated* sample hereafter). U.S. studies usually use the consolidated financial data to conduct empirical tests. It is logical to use consolidated data to study the effect of corporate diversification on earnings quality because separate financial data of parent companies may not reveal the complete picture of corporate diversification and financial characteristics. However, since the separate financial statements of parent companies continue to constitute

[7] Recall that Equation (1) includes both lead and lag cash flows. Therefore, we need data over the period from 1994 to 2005 to calculate AQ over the period from 1999 to 2004.

[8] We use both the financial data of separate financial statements of parent company and consolidated financial statements to take our empirical tests. See the detail described in the later section.

the main financial statements in practice in Taiwan, we use both sets of samples to conduct our empirical work. We also estimate accruals quality using these two sets of samples, respectively. The parent (consolidated) sample consists of 3203 (2088) firm-year observations with all required data.

4. EMPIRICAL RESULTS

4.1 DESCRIPTIVE STATISTICS

Table 1 shows the descriptive statistics of variables for the sample firms. For the brevity of expression, we present the descriptive statistics of financial variables based on the parent sample only. The mean and median values of *AQ* are -0.040 and -0.032, respectively[9]. The mean (median) of the number of industrial segments is 2.166 (2.000). The mean (median) value of the number of countries firms operate is 2.602 (2.000). The maximum number of industrial segments is 11 and the maximum number of countries that firms operate is 15. There are over 45% firm-year financial statements receiving shared opinions. It is evident that the audit scope limitations due to affiliate investments are common in Taiwan. The mean (median) value of *BOD_CONTROL* (the proportion of seats of board controlled by the controlling shareholders) is 0.654 (0.625). The mean (median) value of *OWNERSHIP* (the cash flow rights held by the controlling shareholders) is 0.232 (0.193). The mean (median) value of *O_B* is 0.39 (0.31). The large divergence between ownership and control reveals severe agency problems in Taiwan. Beside, there are over 31% of firm-years with the chairman of the board also taking the CEO position. It is also a warning signal for corporate governance. The mean (median) value of leverage ratio is 0.418 (0.413).

4.2 UNIVARIATE ANALYSIS

Table 2 partitions the whole sample into two sub-samples by three test variables: industrial diversification, global diversification and the type of audit opinions, respectively. Panel A partitions the sample by the level of global diversification. The cutoff threshold is set to be the median (which is equal to 2) of the number of countries where the firm and its affiliates operate. It shows that the average accruals quality of highly globally diversified firms is -0.042 (median -0.034) whereas the average for the low globally diversified firms is -0.039 (median -0.031). The difference is statistically significant at the 1% level. The univariate tests in Panel A show that globally diversification deteriorates accruals quality and

[9] The mean and median of AQ in our study is close to the values documented in Francis et al. (2005) which based on U.S. sample. However, the standard deviation of AQ in our study is larger than theirs due to smaller sample size than their study.

Table 1 The Descriptive Statistics of Variables for Sample Firms

Variables [a]	*N*	*Mean*	*Median*	*S.D.*	*Min.*	*Max.*
AQ	3203	-0.040	-0.032	0.032	-0.444	0.000
GLO_DIV_HERF	3203	-0.897	-1.000	0.181	-1.000	-0.227
IND_DIV_HERF	3203	-0.897	-1.000	0.167	-1.000	-0.279
LN_GLO_DIV_NUM	3203	0.761	0.693	0.619	0.000	2.708
LN_IND_DIV_NUM	3203	0.635	0.693	0.515	0.000	2.398
GLO_DIV_NUM	3203	2.602	2.000	1.762	1.000	15.000
IND_DIV_NUM	3203	2.166	2.000	1.258	1.000	11.000
STD_OPINION	3203	0.543	1.000	0.498	0.000	1.000
SPECIALIST	3203	0.253	0.239	0.103	0.018	0.717
OWNERSHIP	3203	0.232	0.193	0.163	0.000	0.858
BOD_CONTROL	3203	0.654	0.625	0.211	0.083	1.000
O_B	3203	0.390	0.306	0.312	0.000	2.537
DUALITY	3203	0.312	0.000	0.463	0.000	1.000
LEV	3203	0.418	0.413	0.169	0.021	1.688
SIZE	3203	15.389	15.235	1.244	12.486	20.005
SD_CFO	3203	0.077	0.060	0.062	0.003	0.598
SD_SALE	3203	0.166	0.122	0.150	0.003	1.312
OPERCYCLE	3203	5.069	4.999	0.806	0.547	9.514
RD	3203	0.024	0.009	0.047	0.000	0.803
LOSS	3203	1.054	0.000	1.408	0.000	5.000

a. *AQ* = the accruals quality metric measured by cross-sectional DD model (2002) and modified as suggested by McNichols (2002). *IND_DIV_HERF*=Herfindahl index measure of industrial diversification multiplied by (-1). *GLO_DIV_HERF*=Herfindahl index measure of global diversification multiplied by (-1). *LN_IND_DIV_NUM*=the natural log of the numbers of industrial segments the firm operates. *LN_GLO_DIV_NUM*=the natural log of the numbers of countries the firm operates. *IND_DIV_NUM*=the numbers of industrial segments the firm operates. *GLO_DIV_NUM*=the numbers of countries the firm operates. *SPECIALIST*=the auditor's industry specialization measured by the market share of the principal auditor in its client's industry. *STD_OPINION* set to one if the principal auditor issues standard unqualified opinion, and sets to zero if the principal auditor issues shared opinion. *BOD_CONTROL*=the proportion of the seats of board controlled by the controlling shareholders. *OWNERSHIP* = the cash flow rights held by the controlling shareholders. *O_B=OWNERSHIP/BOD_CONTROL*. *DUALITY* =1 if the chairman of board is the CEO, otherwise equals to zero. *SD_SALE* = the standard deviation of sales revenue, scaled by average total assets, calculated over the past five years. *SD_CFO*= the standard deviation of cash flows from operations, scaled by average total assets, calculated over the past five years. *SIZE* = natural log of total assets. *OPERCYCLE* = natural log of the length of operating cycle. *LEV* = total liabilities to total assets ratio. *RD* = R&D intensity = R&D expenses divided sales revenues. *LOSS* = the incidence of loss over the past five years.

thus supports H1a (the information asymmetry hypothesis) with respect to global diversification. It implies that the negative information asymmetry effect dominates the positive offsetting accruals effect for highly globally diversified firms. Beside, highly globally diversified firms are generally also highly industrially diversified. It also shows that highly globally diversified firms are more likely to receive shared opinions (61%) than less globally diversified firms (36%). Thus, global diversification may contribute to the audit scope limitations with respect to foreign subsidiaries and affiliate investments. The operating cash flows are less volatile for highly globally diversified firms. This fact provides some support for the offsetting

Table 2 Descriptive Statistics and Univariate Tests

Panel A: Classification by *Global* Diversification

Variables [b]	*Low Global Diversification* [a] (N=1916)		*High Global Diversification* [a] (N=1287)		*t-value*[c]	*z-value*[c]
	Mean	*Median*	*Mean*	*Median*		
AQ	-0.039	-0.031	-0.042	-0.034	3.04***	-3.49***
IND_DIV_HERF	-0.894	-1.000	-0.900	-1.000	1.02	-0.45
LN_IND_DIV_NUM	0.436	0.693	0.931	0.693	-30.19***	-26.82***
IND_DIV_NUM	1.753	2.000	2.781	2.000	-24.75***	-18.29***
STD_OPINION	0.640	1.000	0.398	0.000	13.88***	-13.48***
SPECIALIST	0.258	0.256	0.244	0.226	3.74***	-3.95***
BOD_CONTROL	0.647	0.625	0.665	0.636	-2.48***	-2.50***
OWNERSHIP	0.245	0.203	0.212	0.180	5.61***	-4.95***
O_B	0.416	0.330	0.351	0.279	5.80***	-5.98***
DUALITY	0.316	0.000	0.305	0.000	0.62	-0.62
LEV	0.422	0.411	0.413	0.414	1.39	-0.68
SIZE	15.100	14.984	15.819	15.645	-16.73***	-15.28***
SD_SALE	0.159	0.118	0.177	0.127	-3.25***	-3.52***
SD_CFO	0.082	0.062	0.070	0.058	5.18***	-3.12***
OPERCYCLE	5.170	5.049	4.919	4.938	8.72***	-7.47***
RD	0.018	0.005	0.032	0.017	-8.52***	-14.56***
LOSS	1.166	1.000	0.886	0.000	5.56***	-5.36***

a. Classified by the median of the number of countries firms operate which is equal to 2 in our sample. Low (high) globally diversified are firms with number of countries in which operates are less or equal to (greater than) 2.

b. AQ = the accruals quality metric measured by cross-sectional DD model (2002) and modified as suggested by McNichols (2002). *IND_DIV_HERF*=Herfindahl index measure of industrial diversification multiplied by (-1). *LN_IND_DIV_NUM*=the natural log of the numbers of industrial segments the firm operates. *IND_DIV_NUM*=the numbers of industrial segments the firm operates. *SPECIALIST*=the auditor's industry specialization measured by the market share of the principal auditor in its client's industry. *STD_OPINION* set to one if the principal auditor issues standard unqualified opinion, and sets to zero if the principal auditor issues shared opinion. *BOD_CONTROL*=the proportion of the seats of board controlled by the controlling shareholders. *OWNERSHIP* = the cash flow rights held by the controlling shareholders. *O_B = OWNERSHIP ÷ BOD_CONTROL*. *DUALITY* =1 if the chairman of board is the CEO, otherwise equals to zero. *LEV* = total liabilities to total assets ratio. *SD_SALE* = the standard deviation of sales revenue, scaled by average total assets, calculated over the past five years. *SD_CFO*= the standard deviation of cash flows from operations, scaled by average total assets, calculated over the past five years. *SIZE* = natural log of total assets. *OPERCYCLE* = natural log of the length of operating cycle. *RD* = R&D intensity = R&D expenses divided sales revenues. *LOSS* = the incidence of loss over the past five years.

c. Test statistics of the difference of mean (*t* test) and median (*Mann-Whitney* test) between two groups, respectively. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, two-tailed, respectively.

accruals hypothesis. Other results in Panel B show that, relative to low globally diversified firms, highly globally diversified firms on average exhibit weaker corporate governance structure with highly affiliated boards, lower cash flow rights held by controlling shareholders and greater divergence between ownership and control. Therefore, globally diversification seems deteriorates the agency problem which is consistent with the information asymmetry hypothesis.

Table 2 Descriptive Statistics and Univariate Tests (Continued)

Panel B: Classification by *Industrial* Diversification

Variables [b]	*Low Industrial Diversification* [a] (N=2340)		*High Industrial Diversification* [a] (N=863)		*t-value*[c]	*z-value*[c]
	Mean	*Median*	*Mean*	*Median*		
AQ	-0.042	-0.034	-0.035	-0.027	-5.93***	-8.39***
GLO_DIV_HERF	-0.898	-1.000	-0.893	-1.000	-0.72	-2.54***
LN_GLO_DIV_NUM	0.625	0.693	1.127	1.099	-21.83***	-20.32***
GLO_DIV_NUM	2.235	2.000	3.599	3.000	-20.70***	-20.32***
STD_OPINION	0.598	1.000	0.393	0.000	10.51***	-10.33***
SPECIALIST	0.250	0.230	0.259	0.256	-1.97**	-1.95**
BOD_CONTROL	0.625	0.600	0.734	0.727	-13.42***	-13.08***
OWNERSHIP	0.234	0.189	0.227	0.195	1.03	-1.00
O_B	0.409	0.328	0.336	0.259	5.91***	-6.21***
DUALITY	0.330	0.000	0.262	0.000	3.70***	-3.69***
LEV	0.412	0.402	0.434	0.433	-3.24***	-4.26***
SIZE	15.111	14.956	16.143	15.993	-22.41***	-21.86***
SD_SALE	0.180	0.135	0.128	0.091	8.71***	-11.91***
SD_CFO	0.085	0.068	0.055	0.043	12.73***	-14.99***
OPERCYCLE	5.083	5.001	5.032	4.993	1.57	-1.83*
RD	0.026	0.012	0.016	0.005	5.28***	-6.30***
LOSS	1.045	0.000	1.076	1.000	-0.56	-1.67*

a. Classified by the median of the number of industrial segments which is equal to 2 in our sample. Low (high) industrially diversified are firms with number of industrial segments less or equal to (greater than) 2.

b. AQ = the accruals quality metric measured by cross-sectional DD model (2002) and modified as suggested by McNichols (2002). *GLO_DIV_HERF*=Herfindahl index measure of global diversification multiplied by (-1). *LN_GLO_DIV_NUM*=the natural log of the numbers of countries the firm operates. *GLO_DIV_NUM*=the numbers of countries the firm operates. *SPECIALIST*=the auditor's industry specialization measured by the market share of the principal auditor in its client's industry. *STD_OPINION* set to one if the principal auditor issues standard unqualified opinion, and sets to zero if the principal auditor issues shared opinion. *BOD_CONTROL*=the proportion of the seats of board controlled by the controlling shareholders. *OWNERSHIP* = the cash flow rights held by the controlling shareholders. *O_B = OWNERSHIP ÷ BOD_CONTROL*. *DUALITY* =1 if the chairman of board is the CEO, otherwise equals to zero. *LEV* = total liabilities to total assets ratio. *SD_SALE* = the standard deviation of sales revenue, scaled by average total assets, calculated over the past five years. *SD_CFO*= the standard deviation of cash flows from operations, scaled by average total assets, calculated over the past five years. *SIZE* = natural log of total assets. *OPERCYCLE* = natural log of the length of operating cycle. *RD* = R&D intensity = R&D expenses divided sales revenues. *LOSS* = the incidence of loss over the past five years.

c. Test statistics of the difference of mean (*t* test) and median (*Mann-Whitney* test) between two groups, respectively. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, two-tailed, respectively.

Panel B partitions the sample by the level of industrial diversification. The cutoff threshold is set to be the median of the number of industrial segments in the whole sample (which is equal to 2). We label firms with more than (equal to or less than) 2 industrial segments as high (low) industrial diversification. It shows that the average level of accruals quality for highly industrially diversified firms is -0.035 (median -0.027) whereas the average for the low industrially diversified firms is -0.042 (median -0.034). The difference is statistically significant at the 1% level. It implies that the positive offsetting accruals effect dominates the negative information asymmetry effect for highly industrially diversified firms and thus supports H1b (the offsetting accruals hypothesis) with respect to industrial

diversification. It also shows that highly industrially diversified firms are more likely to receive shared opinions (61%) than low industrially diversified firms (41%). Thus, industrial diversification also contributes to the audit scope limitations with respect to affiliate investments. Both the volatility of operating cash flows and sales are lower for highly industrially diversified firms relative to low industrially diversified firm. This fact may explain the evidence which is consistent with the offsetting accruals effect of industrial diversification. In addition, Panel B shows that, relative to low industrially diversified firms, highly industrially diversified firms on average have boards highly affiliated with controlling shareholders and greater divergence between ownership and control, higher leverage and higher reliance on industry specialist auditors. These evidences demonstrate that industrial diversification seems deteriorate the agency problem (except for the contribution of external monitoring by the industry specialist auditors) which is consistent with the information asymmetry effect of industrial diversification. However, the univariate tests with respect to AQ imply that the offsetting accruals effect dominates the information asymmetry effect.

Panel C of Table 2 partitions the sample by the type of audit opinion with respect to subsidiaries and affiliate investments. It shows that on average those firm receiving shared opinions, relative to those receiving standard unqualified opinions, have worse accruals quality, higher level of corporate diversification (both industrial and global diversification), and weaker corporate governance structure with highly affiliated boards, lower cash flow rights held by controlling shareholders, greater divergence between ownership and control, and higher leverage.

Table 3 presents the correlation matrix of the main variables. Consistent with the univariate results stated above, accruals quality is positively associated with industrial diversification but negatively associated with global diversification. Accruals quality is also negatively associated with the likelihood of receiving shared opinions, the divergence between ownership and control, the likelihood of chair-CEO duality and leverage. Accruals quality is also negatively associated with four innate factors (sales volatility, cash flow volatility, R&D intensity and loss incidence) and positively associated with firm size.

4.3 MULTIVARIATE REGRESSION ANALYSIS

4.3.1 Multivariate Regression Results Based on the Parent Sample

The effect of global diversification on accruals quality. Table 4 displays the regression results of our empirical model based on the *parent* sample. For both measures of global diversification, it shows that the level of global diversification is

Table 2 Descriptive Statistics and Univariate Tests (Continued)

Panel C: Classification by Audit Opinion (*Standard* Opinion vs. *Shared* Opinion)

Variables [a]	*Shared Opinion* (*STD_OPINION* = 0) (N=1465)		*Standard Opinion* (*STD_OPINION* =1) (N=1738)		*t-value* [b]	*z-value* [b]
	Mean	*Median*	*Mean*	*Median*		
AQ	-0.04	-0.03	-0.04	-0.03	-2.28**	-1.82*
GLO_DIV_HERF	-0.89	-1.00	-0.91	-1.00	2.89***	-3.26***
LN_GLO_DIV_NUM	0.95	1.10	0.60	0.69	17.01***	-16.18***
GLO_DIV_NUM	3.10	3.00	2.18	2.00	15.27***	-16.18***
IND_DIV_HERF	-0.89	-1.00	-0.90	-1.00	1.77*	-2.34**
LN_IND_DIV_NUM	0.76	0.69	0.53	0.69	13.06***	-12.70***
IND_DIV_NUM	2.45	2.00	1.92	2.00	12.08***	-12.70***
SPECIALIST	0.24	0.22	0.27	0.28	-8.21***	-8.44***
BOD_CONTROL	0.68	0.67	0.63	0.60	6.58***	-6.58***
OWNERSHIP	0.21	0.18	0.25	0.21	-6.11***	-5.69***
O_B	0.34	0.27	0.43	0.35	-8.11***	-7.90***
DUALITY	0.32	0.00	0.31	0.00	0.58	-0.58
LEV	0.43	0.42	0.41	0.40	3.33***	-3.56***
SIZE	15.68	15.56	15.14	14.95	12.61***	-13.42***
SD_SALE	0.16	0.12	0.17	0.13	-0.52	-1.99**
SD_CFO	0.07	0.06	0.08	0.06	-6.63***	-5.75***
OPERCYCLE	5.00	4.98	5.13	5.02	-4.45***	-3.44***
RD	0.02	0.01	0.02	0.01	0.91	-0.36
LOSS	1.11	0.00	1.01	0.00	1.97**	-2.04**

a. *AQ* = the accruals quality metric measured by cross-sectional DD model (2002) and modified as suggested by McNichols (2002). *GLO_DIV_HERF*=Herfindahl index measure of global diversification multiplied by (-1). *GLO_DIV_NUM*（*LN_GLO_DIV_NUM*）= the numbers (the natural log of the number) of countries the firm operates. *IND_DIV_HERF*=Herfindahl index measure of industrial diversification multiplied by (-1). *IND_DIV_NUM*（*LN_IND_DIV_NUM*）= the numbers (the natural log of the number) of industrial segments the firm operates. *SPECIALIST*=the auditor's industry specialization measured by the market share of the principal auditor in its client's industry. *BOD_CONTROL*=the proportion of the seats of board controlled by the controlling shareholders. *OWNERSHIP* = the cash flow rights held by the controlling shareholders. *O_B = OWNERSHIP ÷ BOD_CONTROL*. *DUALITY* =1 if the chairman of board is the CEO, otherwise equals to zero. *LEV* = total liabilities to total assets ratio. *SD_SALE* = the standard deviation of sales revenue, scaled by average total assets, calculated over the past five years. *SD_CFO*= the standard deviation of cash flows from operations, scaled by average total assets, calculated over the past five years. *SIZE* = natural log of total assets. *OPERCYCLE* = natural log of the length of operating cycle. *RD* = R&D intensity = R&D expenses divided sales revenues. *LOSS* = the incidence of loss over the past five years.

b. Test statistics of the difference of mean (*t* test) and median (*Mann-Whitney* test) between two groups, respectively. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, two-tailed, respectively.

significantly negatively associated with accruals quality for firms receiving shared audit opinions (β_1 = -0.0164, p<0.01 when *GLO_DIV = GLO_DIV_HERF* and β_1 = -0.0037, p<0.01 when *GLO_DIV = LN_GLO_DIV_NUM*). Therefore, H1a is strongly supported for globally diversified firms. It suggests that the negative information effect dominates the positive offsetting accruals effect for globally diversified firms that received shared opinions. Besides, it shows that greater global diversification does not adversely affect accruals quality for firms receiving standard unqualified opinions if we measure the level of global diversification based on *GLO_DIV_HERF*

(β_1 +β_4=0.0020, p>0.10). It also shows that the adverse effect of global diversification on accruals quality is significantly ameliorated for diversified firms receiving standard unqualified opinions relative to those receiving shared opinions (β_4 = 0.0184, p<0.01). However, greater global diversification continues to adversely affect accruals quality for firms receiving standard unqualified opinions if we measure the level of global diversification based on *LN_GLO_DIV_NUM* (β_1 +β_4 = -0.0036, p<0.01). Therefore, H2a is weakly supported for globally diversified firms by our evidence. It suggests that effective audit without audit scope limitation on the principal auditor mitigates the information asymmetry problem for globally diversified firms.

The effect of industrial diversification on accruals quality. The results in Table 4 demonstrate that when the empirical measure is based on *LN_IND_DIV_NUM*, the level of industrial diversification does not significantly affect accruals quality regardless whether shared opinion or standard unqualified opinion is received (β_2 = -0.0003, p>0.10 and β_2 +β_5 = 0.0003, p>0.10) . However, when the empirical measure is based on *IND_DIV_HERF*, it shows that the level of industrial diversification is significantly positively associated with accruals quality for diversified firms that receive shared opinion (β_2 = 0.0064, p<0.10) but the positive effect of industrial diversification on accruals quality is attenuated for diversified firms that receive standard unqualified opinion (β_5 =-0.0157, p<0.01, β_2 +β_5 = -0.0093, p>0.10). Therefore, H1b and H2b (the offsetting accruals hypothesis) are partly supported for industrially diversified firms. The results of industrial diversification are consistent with the explanations that the positive offsetting accruals effect dominates or mitigates the negative information asymmetry effect for industrially diversified firms. For diversified firms with some material affiliated companies not audited by the principal auditor, greater industrial diversification will mitigate the audit scope limitation problem because the offsetting accruals effect reduces the inherent risk and control risk resulting from information asymmetry. However, for diversified firms receiving standard unqualified opinions, the positive effect of industrial diversification will be attenuated and less sensitive because effective and efficient external audit reduces the financial statement misstatement risk to an acceptable level by adjusting planned detection risk (DR) and make the accruals quality of audited financial statements less sensitive to the combined level of inherent risk and control risk. The evidence in Table 4 suggests that industrial diversification alone does not deteriorate accruals quality even if the principal auditor from auditing all material affiliated companies directly. It is consistent with the finding of Jiraporn et al. (2005).

Table 3 The Correlation Matrix of Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)*AQ*	1.000	-0.028	-0.072***	0.021	0.106***	0.032**	0.125***	0.030**	-0.070***	-0.056***	0.150***
(2)*GLO_DIV_HERF*	-0.028	1.000	0.021	0.583***	0.040**	-0.058***	-0.089***	-0.034*	0.011	-0.024	0.099***
(3)*LN_GLO_DIV_NUM*	-0.058***	0.012	1.000	-0.002	0.544***	-0.286***	-0.085***	-0.116***	-0.006	-0.031*	0.292***
(4)*IND_DIV_HERF*	0.008***	0.491***	-0.010	1.000	0.116***	-0.041**	-0.011	-0.045**	-0.024	-0.007	0.138***
(5)*LN_IND_DIV_NUM*	0.066***	0.002	0.539***	0.099***	1.000	-0.224***	0.019	-0.156***	-0.065***	0.067***	0.439***
(6)*STD_OPINION*	0.040**	-0.051***	-0.288***	-0.031*	-0.225***	1.000	0.149***	0.140***	-0.010	-0.063***	-0.237***
(7)*SPECIALIST*	0.112***	-0.061***	-0.079***	-0.038**	0.023	0.144***	1.000	0.009	-0.047***	0.042**	0.078***
(8)*O_B*	0.043**	-0.005	-0.115***	-0.004	-0.164***	0.142***	0.013	1.000	0.128***	-0.032*	-0.313***
(9)*DUALITY*	-0.064***	0.018	-0.009	-0.036**	-0.067***	-0.010	-0.051***	0.116***	1.000	-0.025	-0.158***
(10)*LEV*	-0.073***	-0.017	-0.044**	-0.010	0.055***	-0.059***	0.031*	-0.048***	-0.021	1.000	0.163***
(11)*SIZE*	0.137***	0.060***	0.308***	0.095***	0.440***	-0.218***	0.093***	-0.308***	-0.154***	0.127***	1.000
(12)*SD_SALE*	-0.294***	-0.025	0.074***	-0.068***	-0.136***	0.009	-0.108***	0.032*	0.047***	-0.011	-0.131***
(13)*SD_CFO*	-0.320***	-0.039**	-0.150***	-0.053***	-0.210***	0.116***	-0.060***	0.084***	0.098***	0.071***	-0.189***
(14)*OPERCYCLE*	-0.065***	-0.067***	-0.189***	0.020	-0.058***	0.078***	-0.014	0.031*	0.077***	0.136***	-0.092***
(15)*RD*	-0.273***	-0.021	0.123***	-0.042**	-0.056***	-0.016	-0.056***	-0.063***	0.091***	-0.262***	-0.114***
(16)*LOSS*	-0.088***	0.020	-0.103***	0.043**	0.002	-0.035**	-0.011	-0.122***	0.000	0.218***	-0.004

a.The definitions of all variables are the same as previous tables. N=3203.

*b.****, **, * represents statistically significant at the 1%, 5%, and 10% levels, two-tailed, respectively. The values of left (right) off-diagonal represents Pearson (Spearman) correlation coefficients.

Table 4 The Estimation Results of Multiple Regression based on Financial Data of *Parent* Companies' Financial Statements

$$AQ_{jt} = \beta_0 + \beta_1 GLO\_DIV_{jt} + \beta_2 IND\_DIV_{jt} + \beta_3 STD\_OPINION_{jt} + \beta_4 GLO\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_5 IND\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_6 SPECIALIST_{jt} + \beta_7 O\_B_{jt} + \beta_8 DUALITY_{jt} + \beta_9 LEV_{jt} + \beta_{10} SIZE_{jt} + \beta_{11} SD\_SALE_{jt} + \beta_{12} SD\_CFO_{jt} + \beta_{13} OPERCYCLE_{jt} + \beta_{14} RD_{jt} + \beta_{15} LOSS_{jt} + \mu_{jt}$$

Variable	*Pred.*[c] *sign*	*GLO_DIV_HERF & IND_DIV_HERF*		*LN_GLO_DIV_NUM & LN_IND_DIV_NUM*	
		Coefficient	*t-Statistic*	*Coefficient*	*t-Statistic*
INTERCEPT	?	-0.0500 ***	-6.35	-0.0555 ***	-6.71
GLO_DIV	-/+	-0.0164 ***	-3.66	-0.0037 ***	-2.66
IND_DIV	-/+	0.0064 *	1.47	-0.0003	-0.21
STD_OPINION	+	0.0037 ***	3.37	0.0040 ***	3.56
GLO_DIV × STD_OPINION	+/-	0.0184 ***	2.84	0.0001	0.08
IND_DIV × STD_OPINION	+/-	-0.0157 **	-2.16	0.0006	0.30
SPECIALIST	+	0.0152 ***	2.83	0.0146 ***	2.74
O_B	+	0.0053 ***	3.16	0.0053 ***	3.09
DUALITY	-	-0.0010	-0.90	-0.0008	-0.72
LEV	-	-0.0217 ***	-5.63	-0.0218 ***	-5.57
SIZE	+	0.0021 ***	4.92	0.0026 ***	5.41
SD_SALE	-	-0.0394 ***	-7.34	-0.0375 ***	-6.92
SD_CFO	-	-0.1100 ***	-8.79	-0.1139 ***	-9.05
OPERCYCLE	-	0.0000	0.02	-0.0002	-0.31
RD	-	-0.1777 ***	-6.95	-0.1689 ***	-6.46
LOSS	-	-0.0020 ***	-5.35	-0.0022 ***	-5.94
Adj. R^2		0.23		0.23	
F stat.		64.77 ***		64.72 ***	
N		3203		3203	
Wald Test:		*Coefficient*	*F stat.*	*Coefficient*	*F stat.*
H_0: $\beta_1+\beta_4=0$	?	0.0020	0.18	-0.0036 ***	7.23
H_0: $\beta_2+\beta_5=0$	?	-0.0093	2.56	0.0003	0.03

a. The definition of all variables is the same as previous tables.

b. The t- statistics are White heteroskedasticity adjusted.

c. (a)/(b) where (a) represents the predicted sign based on the information asymmetry hypothesis and (b) represents the predicted sign based on the offsetting accruals hypothesis.

d. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, one-tailed if coefficient sign is predicted, two-tailed, otherwise.

The effect of control variables on accruals quality. For the results of control variables, it shows that the auditor's industry specialization and firm size are significantly positively associated with accruals quality. The divergence between ownership and control, the financial leverage, the volatility of operating cash flows and revenues, R&D intensity, and the incidence of negative earnings are all

significantly negatively associated with accruals quality. All these results are consistent with our expectation.

4.3.2 Multivariate Regression Results Based on the Consolidated Sample

The effect of global diversification on accruals quality. Table 5 displays the regression results of our empirical model based on the *consolidated* sample. For both measures of global diversification, it shows that the level of global diversification is significantly negatively associated with accruals quality for firms receiving shared audit opinions (β_1 = -0.0165, p<0.01 when *GLO_DIV = GLO_DIV_HERF* and $\beta 1$ = -0.0040, p<0.01 when *GLO_DIV = LN_GLO_DIV_NUM*). Again, H1a is strongly supported for globally diversified firms. Besides, it shows that greater global diversification does not adversely affect accruals quality for firms receiving standard unqualified opinions regardless of which measure of global diversification is used ($\beta 1+\beta 4$= -0.0043, p>0.10 when *GLO_DIV = GLO_DIV_HERF* and $\beta 1+\beta 4$= -0.0011, p>0.10 when *GLO_DIV = LN_GLO_DIV_NUM*). It also shows that the adverse effect of global diversification on accruals quality is significantly ameliorated for diversified firms receiving standard unqualified opinions relative to those receiving shared opinions ($\beta 4$ = 0.0121, p<0.01 when *GLO_DIV = GLO_DIV_HERF*). Therefore, H2a is supported for globally diversified firms.

The effect of industrial diversification on accruals quality. The results in Table 5 demonstrate that when the empirical measure is based on *LN_IND_DIV_NUM,* the level of industrial diversification is significantly positively associated with accruals quality for diversified firms that receive shared opinion (β_2 = 0.0055, p<0.01) but the positive effect of industrial diversification on accruals quality is attenuate for diversified firms that receive standard unqualified opinion ($\beta_2 + \beta_5$ =0.0036, p<0.10). However, when the empirical measure is based on *IND_DIV_HERF*, it shows that the level of industrial diversification does not affect accruals quality regardless whether shared opinion or standard unqualified opinion is received (β_2 = 0.0006, p>0.10 and $\beta_2 + \beta_5$ = -0.0083, p>0.10). Therefore, H1b and H_{2b} (the offsetting accruals hypothesis) are weakly supported for industrially diversified firms.

The estimation results of control variables are substantially the same with those in Table 4. Almost all the estimated coefficients of control variables have signs as expected and most are statistically significant. We do not discuss further for brevity.

Table 5 The Estimation Results of Multiple Regressions based on *Consolidated* Financial Data [a]

$$AQ_{jt} = \beta_0 + \beta_1 GLO\_DIV_{jt} + \beta_2 IND\_DIV_{jt} + \beta_3 STD\_OPINION_{jt} + \beta_4 GLO\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_5 IND\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_6 SPECIALIST_{jt} + \beta_7 O\_B_{jt} + \beta_8 DUALITY_{jt} + \beta_9 LEV_{jt} + \beta_{10} SIZE_{jt} + \beta_{11} SD\_SALE_{jt} + \beta_{12} SD\_CFO_{jt} + \beta_{13} OPERCYCLE_{jt} + \beta_{14} RD_{jt} + \beta_{15} LOSS_{jt} + \mu_{jt}$$

Variable	*Pred.*[c] *sign*	*GLO_DIV_HERF & IND_DIV_HERF*		*LN_GLO_DIV_NUM & LN_IND_DIV_NUM*	
		Coefficient	*t-Statistic*	*Coefficient*	*t-Statistic*
INTERCEPT	?	-0.0735 ***	-7.93	-0.0614 ***	-6.08
GLO_DIV	-/+	-0.0165 ***	-2.59	-0.0040 ***	-2.36
IND_DIV	-/+	0.0006	0.08	0.0055 ***	3.07
STD_OPINION	+	0.0035 ***	2.37	0.0011	0.73
GLO_DIV × STD_OPINION	+/-	0.0121 *	1.37	0.0029	1.20
IND_DIV × STD_OPINION	+/-	-0.0089	-0.89	-0.0019	-0.71
SPECIALIST	+	0.0305 ***	5.23	0.0363 ***	4.93
O_B	+	0.0107 ***	5.05	0.0092 ***	3.92
DUALITY	-	-0.0005	-0.39	-0.0008	-0.58
LEV	-	-0.0247 ***	-5.07	-0.0329 ***	-6.26
SIZE	+	0.0034 ***	6.97	0.0029 ***	5.05
SD_SALE	-	-0.0210 ***	-4.37	-0.0120 ***	-2.60
SD_CFO	-	-0.1013 ***	-5.34	-0.0767 ***	-4.77
OPERCYCLE	-	-0.0011 *	-1.35	-0.0012	-1.20
RD	-	-0.0564 **	-2.12	-0.1220 ***	-5.16
LOSS	-	-0.0012 ***	-2.95	-0.0021 ***	-4.39
Adj. R^2		0.17		0.17	
F stat.		29.40		22.32	
N		2088		2088	
Wald Test:		*Coefficient*	*F stat.*	*Coefficient*	*F stat.*
H_0: $\beta_1+\beta_4=0$	?	-0.0043	0.47	-0.0011	0.32
H_0: $\beta_2+\beta_5=0$	?	-0.0083	1.50	0.0036 *	3.16

a. We replace parents' financial data by consolidated financial data (including estimating AQ by consolidated data) if parents prepare consolidated financial statements. We continue to use parents' financial data if parents do not prepare consolidated financial statements.

b. The definition of all variables is the same as previous tables.

c. (a)/(b) where (a) represents the predicted sign based on the information asymmetry hypothesis and (b) represents the predicted sign based on the offsetting accruals hypothesis.

d. The t- statistics are White heteroskedasticity adjusted.

e. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, one-tailed if coefficient sign is predicted, two-tailed, otherwise.

4.4 ROBUSTNESS TESTS

4.4.1 Results using segment reporting data to measure corporate diversification

Since many studies (particularly U.S. studies) use segment reporting data to derive the corporate diversification measures, to be comparable with these studies, we hand collect the segment reporting data from the financial statement footnotes of Taiwan listed and OTC firms. If the company prepares consolidated financial statements, we use the segment reporting data of consolidated statements to replace the segment reporting data of parents' separate financial statements. We collect the industrial and geographic segment reporting data to calculate industrial diversification measures and global diversification measures. *LN_IND_SEG_NUM* (*LN_GEO_SEG_NUM*) represents the natural log of the number of business segments across different industry groups (geographic areas) reported in the footnote. We set *LN_IND_SEG_NUM* (*LN_GEO_SEG_NUM*) to be zero if thesample firm does not report industrial segment (geographic segment) data[10]. We also construct diversification measures based on Herfindahl index. *IND_SEG_HERF* (*GEO_SEG_HIRF*) = [the sum of the squares of each industrial segment's revenues (revenues from each geographic segment) as a percentage of the total revenues] multiplied by (-1) = $(-1)\times\sum\left(SSales/Sales\right)^2$ where SSales denotes each segmental revenues and Sales denotes the reported total revenues[11]. The segmental revenues are based on sales to customers outside the affiliated business group and excluding those sales among segments within the same business group. We count the "other" segment item as one individual segment when calculating these four measures. There are about 25% (19%) of Taiwan listed and OTC firms disclosing geographic (industrial) segment data over the period 1999-2004. The mean of the number of reported geographic (industrial) segments is 0.56 (0.36) and the maximum number of reported geographic (industrial) segments is 5 (11)[12].

The effect of global diversification on accruals quality. Table 6 displays the regression results of our empirical model based on the corporate diversification measures constructed from segment reporting data. For both measures of global diversification, it shows that the level of global diversification is significantly negatively associated with accruals quality for firms receiving shared audit opinions

[10] The data of segment number is more discrete and less dispersed than the data of TEJ's BAOP. All the results are substantially the same if we do not take the natural log of segment number.

[11] The total revenue is equal to the consolidated revenue if the consolidated data is used and equal to the parent's total revenue if the parent's data is used.

[12] The geographic segment reporting data usually disclose the sales from business segments operating in broad geographic areas, such as China, Asia (excluding China), America, Europe and Australia. The immaterial business segments usually are aggregated into the "other" item.

Table 6 The Estimation Results of Multiple Regressions based on Segment Reporting Data

$$AQ_{jt} = \beta_0 + \beta_1 GLO\_DIV_{jt} + \beta_2 IND\_DIV_{jt} + \beta_3 STD\_OPINION_{jt} + \beta_4 GLO\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_5 IND\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_6 SPECIALIST_{jt} + \beta_7 O\_B_{jt} + \beta_8 DUALITY_{jt} + \beta_9 LEV_{jt} + \beta_{10} SIZE_{jt} + \beta_{11} SD\_SALE_{jt} + \beta_{12} SD\_CFO_{jt} + \beta_{13} OPERCYCLE_{jt} + \beta_{14} RD_{jt} + \beta_{15} LOSS_{jt} + \mu_{jt}$$

Variable	*Pred.*[c] *sign*	*GEO_SEG_HERF & IND_SEG_HERF*		*LN_GEO_SEG_NUM & LN_IND_SEG_NUM*	
		Coefficient	*t-Statistic*	*Coefficient*	*t-Statistic*
INTERCEPT	?	-0.0720 ***	-7.66	-0.0737 ***	-8.07
GLO_DIV	-/+	-0.0145 ***	-2.44	-0.0038 **	-2.42
IND_DIV	-/+	0.0105 ***	2.70	0.0006	1.08
STD_OPINION	+	0.0024 **	1.65	0.0006	0.35
GLO_DIV × STD_OPINION	+/-	0.0149 **	1.66	0.0051 ***	2.84
IND_DIV × STD_OPINION	+/-	-0.0053	-0.97	0.0000	0.04
SPECIALIST	+	0.0333 ***	5.55	0.0329 ***	5.56
O_B	+	0.0103 ***	4.94	0.0107 ***	5.11
DUALITY	-	-0.0010	-0.71	-0.0008	-0.62
LEV	-	-0.0255 ***	-5.01	-0.0258 ***	-5.06
SIZE	+	0.0035 ***	6.77	0.0037 ***	7.04
SD_SALE	-	-0.0167 ***	-3.44	-0.0172 ***	-3.59
SD_CFO	-	-0.1049 ***	-5.15	-0.1061 ***	-5.24
OPERCYCLE	-	-0.0017 **	-2.01	-0.0015 **	-1.89
RD	-	-0.0430 **	-1.87	-0.0443 **	-1.91
LOSS	-	-0.0018 ***	-4.07	-0.0017 ***	-3.94
Adj. R^2		0.18		0.18	
F stat.		29.50 ***		30.05 ***	
N		1925		1925	
Wald Test:		*Coefficient*	*F stat.*	*Coefficient*	*F stat.*
H_0:$\beta_1+\beta_4=0$	?	0.0004	0.01	0.0013	1.63
H_0:$\beta_2+\beta_5=0$	?	0.0051	1.73	0.0007	1.62

a. We replace parents' financial data and segment reporting data by consolidated financial data (including estimating AQ by consolidated data) if parents prepare consolidated financial statements. We continue to use parents' financial data and segment reporting data if parents do not prepare consolidated financial statements.

b. The definition of all variables is the same as previous tables.

c. (a)/(b) where (a) represents the predicted sign based on the information asymmetry hypothesis and (b) represents the predicted sign based on the offsetting accruals hypothesis.

d. The t- statistics are White heteroskedasticity adjusted.

e. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, one-tailed if coefficient sign is predicted, two-tailed, otherwise.

(β_1 = -0.0145, p<0.01 when *GLO_DIV = GEO_SEG_HERF* and β_1 = -0.0038, p<0.05 when *GLO_DIV = LN_GEO_SEG_NUM*). Again, H1a is strongly supported for globally diversified firms. Besides, it shows that greater global diversification does not adversely affect accruals quality for firms receiving standard unqualified opinions regardless of which measure of global diversification is used ($\beta_1+\beta_4$ = 0.0004, p>0.10 when *GLO_DIV = GEO_SEG_HERF* and $\beta_1+\beta_4$= 0.0013, p>0.10 when *GLO_DIV = LN_GEO_SEG_NUM*). It also shows that the adverse effect of global diversification on accruals quality is significantly ameliorated for diversified firms receiving standard unqualified opinions relative to those receiving shared opinions (β_4 = 0.0149, p<0.05 when *GLO_DIV = GEO_SEG_HERF* and β_4= 0.0051, p<0.01 when *GLO_DIV = LN_GEO_SEG_NUM*). Therefore, H2a is supported for globally diversified firms.

The effect of industrial diversification on accruals quality. The results of Table 6 demonstrate that that when the empirical measure is based on *IND_SEG_HERF*, the level of industrial diversification is significantly positively associated with accruals quality for diversified firms that receive shared opinion (β_2 = 0.0105, p<0.01) but the positive effect of industrial diversification on accruals quality is attenuate for diversified firms that receive standard unqualified opinion (β_2 +β_5 =0.0051, p>0.10). However, when the empirical measure is based on *IND_DIV_HERF*, it shows that the level of industrial diversification does not affect accruals quality regardless whether shared opinion or standard unqualified opinion is received (β_2 = 0.0006, p>0.10 and β_2 +β_5 = 0.0007, p>0.10). Therefore, H1b and H2b (the offsetting accruals hypothesis) are weakly supported for industrially diversified firms.

Overall, the evidence documented in Table 6 is substantially consistent with those documented in Table 5. Therefore, the findings based on the TEJ's BAOP data documented in previous section continue to hold if we measure the corporate diversification based on the segmenting reporting data.

4.4.2 Results for alternative measure of accruals quality

Since all empirical measures of accruals quality are imperfect and subject to measurement error, we employ two alternative measures of accrual quality to gauge the robustness of our results. Without taking the standard deviation of rolling five year residuals, one alternative measure is to take the absolute value of current year's residual of DD model which is refined as suggested by McNichols (2002) (e.g., Aboody, Hughes and Liu 2005; Wang 2006). We take this approach as our first alternative measure of accruals quality. Specifically, we define $AQ\_ABS\_FR_{jt}$ as $-\left|\hat{\upsilon}_{jt}\right|$, where $\left|\hat{\upsilon}_{jt}\right|$ is the absolute value of the estimated residuals from modified

DD model as specified in equation (1). Higher value of AQ_ABS_FR implies better accruals quality. The results based on AQ_ABS_FR are presented on Panel A of Table 7. The effect of global diversification is still very consistent with those documented above, but the effect of industrial diversification is not significant regardless of the type of audit opinion received. Therefore, H1a and H2a is strongly supported for globally diversified firms.

The second alternative measure is based on the popular modified Jones model (Dechow, Sloan and Sweeney 1995) and performance-adjusted as Kothari, Leone and Wasley (2005) suggested. We denote this measure as AQ_ABS_JONES which is estimated by the following model:

$$\begin{aligned} TA_{jt} &= \beta_0 + \beta_1\left(1/ ASSET_{jt}\right) + \beta_2\left(\Delta REV_{jt} - \Delta AR_{jt}\right) + \beta_2 PPE_{jt} + \beta_3 ROA_{jt-1} \\ &\quad + \mu_{jt} AQ\_ABS\_JONES_{jt} \\ &= -\left|\hat{\mu}_{jt}\right| \\ &= -\left|TA_{jt} - \left\{\hat{\beta}_0 + \hat{\beta}_1\left(1/ ASSET_{jt}\right) + \hat{\beta}_2\left(\Delta REV_{jt} - \Delta AR_{jt}\right) + \hat{\beta}_2 PPE_{jt} + \hat{\beta}_3 ROA_{jt-1}\right\}\right| \quad (3) \end{aligned}$$

where TA_{jt} = total accruals in year t = $NIBE_{jt} - CFO_{jt}$, $NIBE_{jt}$ =net income before extraordinary items in year t, ΔREV_{jt} =change in sales revenues between year t-1 and year t, ΔAR_{jt} =change in accounts receivable between year t-1 and year t, PPE_{jt} =gross value of PPE at the end of year t, ROA_{jt-1} is the rate of return on total assets for year t-1. All variables in equation (3) except for ROA_{jt-1} are scaled by average total assets over year t-1 and year t. We estimate model (3) cross-sectionally by each industry and year for non-financial industry groups with greater or equal 10 observations in the given year. The results based on AQ_ABS_JONES are presented on Panel B of Table 7. All the results are consistent with those reported on section 4.3. Again, greater global diversification deteriorates accruals quality for diversified firms receiving shared opinions regardless of which measure of global diversification is used. Besides, the adverse effect of global diversification on accruals quality is mitigated if the principal auditor issues standard unqualified opinion. There is weak evidence which shows that greater industrial diversification improves accruals quality for diversified firms receiving shared opinions.

5. CONCLUDING REMARKS

We examine whether corporate diversification improves or deteriorates earnings quality and whether the limitation of audit scope due to subsidiaries or affiliate investments not audited by the principal auditor exacerbates the earnings quality problem for diversified firms in Taiwan. We make an explicit distinction

Table 7 The Estimation Results based on Alternative Accruals Quality Measures[a]

Panel A: *AQ=AQ_ABS_FR*

$$AQ_{jt} = \beta_0 + \beta_1 GLO\_DIV_{jt} + \beta_2 IND\_DIV_{jt} + \beta_3 STD\_OPINION_{jt} + \beta_4 GLO\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_5 IND\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_6 SPECIALIST_{jt} + \beta_7 O\_B_{jt} + \beta_8 DUALITY_{jt} + \beta_9 LEV_{jt} + \beta_{10} SIZE_{jt} + \beta_{11} SD\_SALE_{jt} + \beta_{12} SD\_CFO_{jt} + \beta_{13} OPERCYCLE_{jt} + \beta_{14} RD_{jt} + \beta_{15} LOSS_{jt} + \mu_{jt}$$

Variable	*Pred. Sign*	*GLO_DIV_HERF & IND_DIV_HERF*		*LN_GLO_DIV_NUM & LN_IND_DIV_NUM*	
		Coefficient	*t-Statistic*	*Coefficient*	*t-Statistic*
INTERCEPT	?	-0.0675 ***	-4.85	-0.0715 ***	-4.95
GLO_DIV	-/+	-0.0106 **	-1.79	-0.0056 **	-2.27
IND_DIV	-/+	0.0017	0.23	0.0027	1.18
STD_OPINION	+	0.0034 **	1.81	0.0038 **	2.00
GLO_DIV × STD_OPINION	+/-	0.0166 *	1.47	0.0040	1.18
IND_DIV × STD_OPINION	+/-	-0.0048	-0.36	-0.0036	-1.09
SPECIALIST	+	0.0167 **	1.77	0.0155 **	1.68
O_B	+	0.0078 ***	2.44	0.0078 ***	2.45
DUALITY	-	-0.0012	-0.64	-0.0010	-0.50
LEV	-	-0.0376 ***	-4.65	-0.0378 ***	-4.62
SIZE	+	0.0033 ***	4.42	0.0036 ***	4.49
SD_SALE	-	-0.0330 ***	-4.31	-0.0308 ***	-3.91
SD_CFO	-	-0.0839 ***	-4.52	-0.0859 ***	-4.56
OPERCYCLE	-	-0.0006	-0.49	-0.0008	-0.65
RD	-	-0.1303 ***	-3.97	-0.1224 ***	-3.66
LOSS	-	-0.0007	-1.16	-0.0009 *	-1.42
Adj. R^2		0.07		0.07	
F stat.		17.66 ***		17.89 ***	
N		3203		3203	
Wald Test:		*Coefficient*	*F stat.*	*Coefficient*	*F stat.*
H_0:$\beta_1+\beta_4=0$	?	0.0060	0.49	-0.0015	0.54
H_0:$\beta_2+\beta_5=0$	?	-0.0031	0.77	-0.0009	0.74

a. The financial data are based on the Parents' financial statements. The definition of all variables is the same as previous tables.
b. The t- statistics are White heteroskedasticity adjusted.
c. (a)/(b) where (a) represents the predicted sign based on the information asymmetry hypothesis and (b) represents the predicted sign based on the offsetting accruals hypothesis.
d. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, one-tailed if coefficient sign is predicted, two-tailed, otherwise.

between *global* diversification and *industrial* diversification. We recognize that there are two potential but opposite effects of corporate diversifications on accruals quality, namely, the negative information asymmetry effect and the positive offsetting accruals effect. We also suggest that the relative impacts of these two effects may be different between global diversification and industrial diversification. We find that after controlling the level of industrial diversification, greater *global*

Table 7 The Estimation Results based on Alternative Accruals Quality Measures[a] (Continued.)

Panel B: *AQ=AQ_ABS_JONES*

$$AQ_{jt} = \beta_0 + \beta_1 GLO\_DIV_{jt} + \beta_2 IND\_DIV_{jt} + \beta_3 STD\_OPINION_{jt} + \beta_4 GLO\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_5 IND\_DIV_{jt} \times STD\_OPINION_{jt} + \beta_6 SPECIALIST_{jt} + \beta_7 O\_B_{jt} + \beta_8 DUALITY_{jt} + \beta_9 LEV_{jt} + \beta_{10} SIZE_{jt} + \beta_{11} SD\_SALE_{jt} + \beta_{12} SD\_CFO_{jt} + \beta_{13} OPERCYCLE_{jt} + \beta_{14} RD_{jt} + \beta_{15} LOSS_{jt} + \mu_{jt}$$

Variable	*Pred.*[c] *sign*	*GLO_DIV_HERF & IND_DIV_HERF*		*LN_GLO_DIV_NUM & LN_IND_DIV_NUM*	
		Coefficient	*t-Statistic*	*Coefficient*	*t-Statistic*
INTERCEPT	?	-0.0421 ***	-2.49	-0.0398 **	-2.21
GLO_DIV	-/+	-0.0103 **	-1.72	-0.0049 **	-2.18
IND_DIV	-/+	0.0029	0.32	0.0039 *	1.40
STD_OPINION	+	0.0004	0.19	0.0004	0.21
GLO_DIV × STD_OPINION	+/-	0.0127 *	1.56	0.0023	0.60
IND_DIV × STD_OPINION	+/-	-0.0007	-0.05	-0.0003	-0.06
SPECIALIST	+	0.0161 **	1.63	0.0148 *	1.51
O_B	+	0.0069 **	2.01	0.0071 **	2.06
DUALITY	-	-0.0058 ***	-2.56	-0.0056 ***	-2.49
LEV	-	-0.0292 ***	-4.03	-0.0295 ***	-4.06
SIZE	+	0.0023 ***	2.69	0.0022 **	2.35
SD_SALE	-	-0.0279 ***	-3.17	-0.0257 ***	-2.86
SD_CFO	-	-0.2765 ***	-10.06	-0.2768 ***	-10.01
OPERCYCLE	-	-0.0043 ***	-2.84	-0.0045 ***	-2.96
RD	-	0.0002	0.01	0.0073	0.25
LOSS	-	0.0010 *	1.37	0.0009	1.21
Adj. R^2		0.14		0.14	
F stat.		34.80 ***		35.00 ***	
N		3218		3218	
Wald Test:		*Coefficient*	*F stat.*	*Coefficient*	*F stat.*
H_0: $\beta_1+\beta_4=0$	?	0.0024	0.07	-0.0026	0.79
H_0: $\beta_2+\beta_5=0$	?	0.0022	0.05	0.0036	1.13

a. The financial data are based on the Parents' financial statements. The definition of all variables is the same as previous tables.
b. The t- statistics are White heteroskedasticity adjusted.
c. (a)/(b) where (a) represents the predicted sign based on the information asymmetry hypothesis and (b) represents the predicted sign based on the offsetting accruals hypothesis.
d. ***, **, * represents statistically significant at the 1%, 5%, and 10% levels, one-tailed if coefficient sign is predicted, two-tailed, otherwise.

diversification deteriorates accruals quality for diversified firms that receive shared opinions. However, the adverse effects of global diversification on accruals quality will be mitigated if the principal auditor issues standard unqualified opinions.

Besides, after controlling the level of global diversification, there is weak evidence which shows that greater industrial diversification may mitigate the accruals quality problem for diversified firms receiving shared opinions. Overall, the results for global diversification suggest that for globally diversified firms, the negative information asymmetry effect dominates the positive offsetting accruals effect. The results for industrial diversification imply that for industrially diversified firms, the positive offsetting accruals effect mitigates the negative information asymmetry effect. Our findings also provide support for the critical monitoring role of external auditing. As greater global diversification increases the inherent risk and control risk for diversified firms, effective external auditing will help to ameliorate the information asymmetry problem. Our results are robust across various measures of corporate diversification, various measures of accruals quality, and various source of data.

Since global diversification has been the crucial business strategies of large Taiwan business enterprises to seek for growth opportunities, enhance cost efficiency and diversify business risk, the findings of our study suggest that those potential benefits of global diversifications must be traded off against their adverse effects on earnings quality. Moreover, our results demonstrate that the impacts of industrial diversification on earnings quality may be different from that of global diversification. Finally, the evidence documented in our study confirms the criticism that the unobservability of material foreign subsidiaries or affiliate investments by the principal auditor adversely impairs the audit quality and provides empirical support for the regulatory reform to strengthen the auditor's responsibility for globally diversified firms. In sum, our finding in this study suggests that the earnings quality problem is more severe for highly globally diversified firms that operate in single industrial segment and receive shared audit opinions.

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