Is integrated auditing superior to separate auditing? Evidence from China

Li Dang\textsuperscript{a} and Qiaoling Fang\textsuperscript{b}

\textsuperscript{a}Orfalea College of Business, California State Polytechnic University, San Luis Obispo, California, USA; \textsuperscript{b}College of Management, Ocean University of China, Laoshan District, Qingdao, China

\textbf{ABSTRACT}

The purpose of this study is to compare audit effectiveness and audit efficiency between companies that have integrated auditing of internal control over financial reporting (ICFR) and financial statements and companies that have separate auditing. We analyse a sample of Chinese public companies that disclosed their ICFR audit reports from 2011 to 2015. Using the full sample, subsamples, and a propensity score matching (PSM) sample, we consistently find that companies having integrated auditing exhibit higher financial reporting quality measured by excess non-operating income. The findings regarding audit efficiency are mixed, with limited evidence indicating that an integrated auditor is potentially able to complete two audits without further delay. Overall, our results seem to suggest that integrated auditing is superior to separate auditing in that it enhances audit effectiveness and might improve audit efficiency. Such superiority might be due to knowledge spillover when two related audit services are jointly provided.

\section{1. Introduction}

Standard setters seem to favour integrated auditing, i.e. the audit of internal control over financial reporting (ICFR) integrated with the financial statements (FS) audit. Since 2004, ICFR audits have been required for U.S. accelerated filers. According to the Public Company Accounting Oversight Board (Public Company Accounting Oversight Board [PCAOB], 2007), 'The audit of internal control over financial reporting should be integrated with the audit of the financial statements ... In an integrated audit of internal control over financial reporting and the financial statements, the auditor should design his or her testing of controls to accomplish the objectives of both audits simultaneously ...' Unlike the U.S., in China, ICFR audit can be integrated with the FS audit or performed separately. Chinese companies have the option to choose integrated auditing or separate auditing. While both options are available, the vast majority of Chinese companies choose integrated auditing. Is integrated auditing superior to separate auditing? More specifically,
does integrated auditing improve audit effectiveness and audit efficiency? Our study attempts to answer these questions and provide empirical evidence on the superiority of integrated auditing.

Although little research has been done on the consequences of integrated auditing and separate auditing, previous studies have documented the existence of knowledge spillover from the joint provision of non-audit services (NAS) and audit services (e.g. Beck & Wu, 2006; Christensen et al., 2015; Gleason & Mills, 2011; Kinney et al., 2004; Knechel & Sharma, 2012; Koh et al., 2013; Krishnan & Visvanathan, 2011; Krishnan & Yu, 2011; Nam & Ronen, 2012; Robinson, 2008; Simunic, 1984). Unlike the connection between NAS and audit services, the ICFR audit and the FS audit are closely intertwined. Specifically, maintaining effective ICFR provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements. Therefore, an auditor’s intricate knowledge about a client’s ICFR affects the effectiveness of the FS audit. It is plausible to expect an even ‘stronger’ knowledge spillover effect between ICFR and FS audits. If knowledge spillover exists and it improves the overall audit effectiveness, it follows that financial reporting quality would be higher for companies that have the same external auditor perform both audits. Furthermore, such client-specific knowledge is likely to help improve audit efficiency by avoiding duplication and overlapping of audit procedures. Therefore, integrated auditing may yield a higher level of audit effectiveness and efficiency due to knowledge spillover.

In China, the Enterprise Internal Control Standard (EICS) does not require the ICFR audit to be integrated with the FS audit. Chinese companies can choose to have the same auditor jointly perform ICFR and FS audits (i.e. integrated auditing) or have two different auditors perform these two audits separately (i.e. separate auditing). Although most of companies choose integrated auditing, some choose separate auditing, which seems counterintuitive. This unique institutional background provides an opportunity to empirically compare the consequences of integrated auditing with those of separate auditing, where there is a lack of empirical literature. To our knowledge, there have been two studies (i.e. Zhang & Han, 2016; Gunn et al., in press) that empirically compares audit quality between integrated auditing and separate auditing. Using a sample of Chinese companies that voluntarily disclosed their ICFR audit reports in 2008, Zhang and Han (2016) find that companies choosing separate auditing are more likely to receive a ‘non-clean’ FS audit opinion. They interpret this result as ‘separate auditing yields higher FS audit quality’. After the study year (i.e. 2008) in Zhang and Han (2016), China issued more regulations\(^1\) related to EICS. For instance, prior to year 2011, EICS implementations were all voluntary. In fiscal year 2011, as mandatory EICS implementers, 67 cross-listed companies were the first batch to disclose their ICFR reports. Starting from 2012, companies listed on the main board began mandatory implementations at scheduled times.\(^2\)

\(^1\)To provide guidance on the implementation of EICS, the five Chinese governmental departments issued the Supporting Guidelines for Internal Control of Enterprises in April 2010. In August 2012, the Chinese Ministry of Finance and the China Securities Regulatory Commission jointly issued the Notice on Implementations of the Enterprise Internal Control Standard by Companies Listed on the Main Board under Different Categories and Groups as of 2012 (2012 Notice). The purpose of the 2012 Notice was to ensure smooth implementations of EICS.

\(^2\)According to the 2012 Notice, state-owned public companies listed on the main board are required to implement EICS in 2012. All other companies listed on the main board should implement EICS no later than 2014. The 2012 Notice also encourages early voluntary implementations.
Given that the institutional background has changed significantly since the study period in Zhang and Han (2016), new empirical evidence on the consequences of integrated auditing vs. separate auditing is needed. Gunn et al. (in press) address this issue by comparing outcomes (i.e. audit quality and audit efficiency) of integrated auditing vs. separate auditing using a sample period of 2011–2016. Different from Zhang and Han, Gunn et al. (in press) examine both ICFR and FS audit quality with a focus on ICFR audit. Specifically, they find that separate ICFR audits are associated with higher quality compared to integrated ICFR audits. The audit cost analysis indicates that FS audits are more efficient when conducted in the separate auditing setting. In their additional analysis, Gunn et al. (in press) provide limited evidence that separate FS audits are associated with higher quality compared to integrated FS audits, which is consistent with the finding in Zhang and Han (2016).\(^3\) Overall, Gunn et al. (in press) challenge the assumption that integrated audits are more effective and efficient than separate audits. As the first study that tests this assumption, it has significant implications to policy makers. Perhaps, one size does not fit all, and it is beneficial to allow some companies to adopt alternative ICFR audit arrangements.

Although our study addresses similar issues, such as audit quality and audit efficiency, it differs from Gunn et al. (in press) in the following two primary aspects. First, while Gunn et al. (in press) provide a thorough coverage of how separate audits might impact both ICFR and FS audit quality and audit efficiency, our study exclusively focuses on the FS audit quality and efficiency. Such a focus stems from the theory of knowledge spillover. Assuming there is knowledge spillover between FS audit and ICFR audit, we expect that integrated auditor is more effective and efficient compared to the separate FS auditor in performing the FS audit service. Second, our measures for FS audit quality and FS audit efficiency are different from the ones used in Gunn et al. (2022).\(^4\) Additionally, our sample period is one year shorter.

Analysing a sample of Chinese companies that disclosed their ICFR audit reports during the period 2011 to 2015, we find that companies having integrated auditing show a lower level of excess non-operating income (ENOI) than companies having separate auditing. Since E NOI reversely measures financial reporting quality, this result indicates that integrated auditing yields a higher level of financial reporting quality, which is an outcome of enhanced audit effectiveness. We interpret this result as the existence of knowledge spillover between ICFR and FS audits. The results are consistent and robust when we run the analysis using (1) a sub-sample of companies that mandatorily disclose their ICFR audit reports, (2) a sub-sample of companies that voluntarily disclose their ICFR audit reports, and (3) a propensity score matching (PSM) sample.

---

\(^3\)Gunn et al. (in press) use a direct and ex-post dichotomous measure for FS audit quality. Specifically, a restatement of financial statements in a subsequent period indicates ‘poor’ FS audit quality.

\(^4\)As mentioned in footnote\(^3\), Gunn et al. (in press) use an ex-post direct FS audit quality measure. In this study, we use ‘earnings management’ to indirectly measure the FS audit quality. In terms of measuring audit efficiency, Gunn et al. (in press) use audit fees, while we use the audit report lag.

\(^5\)As mentioned in footnote\(^2\), since 2014, all main board companies are required to have their ICFR audited. The requirement for companies listed on SME board and GEM board is different. Except for those cross-listed companies, SME and GEM companies are only subject to ICFR reviews. Although ICFR audits and ICFR reviews follow different guidelines, the common goal of both assurance services is to provide assurance on the effectiveness of a client company’s ICFR. Because the focus of this study is to examine whether integrating the ICFR audit with the FS audit improves audit effectiveness and audit efficiency, we include both ICFR audits and ICFR reviews in our full sample. Unless otherwise indicated, we do not differentiate these two types of ICFR assurance services in this study.
We analyse audit report lags\textsuperscript{6} to explore whether integrated auditing improves audit efficiency. The full sample analysis indicates that audit report lag for integrated auditing is not different from that for separated auditing. Note that the integrated auditor not only performs the FS audit but also the ICFR audit, an additional audit service. Improved efficiency and increased workload have opposite effects on audit report lag. Because the integrated auditor has a higher workload compared to the external auditor who only performs the FS audit, such a result indicates that integrated auditing not only improves audit efficiency, but such improved audit efficiency fully offsets the effect of increased workload on audit report lag. The result using a sub-sample of companies that are required to disclose their ICFR audit reports is consistent with the full sample result. That is, we find no significant difference in audit report lag between integrated auditing and separate auditing. That means, the integrated auditors are able to complete both FS and ICFR audits as timely as the auditors that only perform the FS audits.

The analysis using a sub-sample of voluntary companies indicates that more time is required for integrated auditors to complete both FS and ICFR audits than for FS auditors to complete the FS audits. Such a result does not warrant a conclusion. There are two possible explanations for this result: (1) integrated auditing might not improve audit efficiency; or (2) integrated auditing improves audit efficiency, but the magnitude of the improved audit efficiency is not large enough to offset the effect of increased workload on audit report lag.

Although the above samples yield different results, the analysis using the PSM sample shows a significantly shorter audit report lag for integrated auditing. This suggests that integrated auditing not only improves audit efficiency, but the magnitude of improved efficiency is significant enough to outweigh the effect of increased workload on audit report lag. Such improved audit efficiency might be attributable to knowledge spillover when two audits are performed jointly. After all, the integrated auditor’s client-specific knowledge is likely to help improve audit efficiency by avoiding duplication and overlapping of audit procedures.

In summary, the results of analysing audit report lag are inconsistent using different samples. Notice that, of the total 7,027 observations in our full sample, 6,869 (97.8\%) and 158 (2.2\%) represent cases of integrated auditing and separate auditing, respectively. Despite the limitations of propensity score matching, it provides a more balanced sample (integrated auditing vs. separate auditing) and addresses potential issues caused by severely imbalanced samples. Therefore, we consider the results using the PSM sample more reliable.

Collectively speaking, our results seem to suggest that integrated auditing is superior to separate auditing because it enhances FS audit effectiveness, and it potentially improves FS audit efficiency. This study makes several important contributions. First of all, it adds new evidence on the consequences of integrated auditing vs. separate auditing in a mandatory regime. Contrary to Gunn et al. (in press) and Zhang and Han (2016), we

\textsuperscript{6}In our sample, the integrated auditor’s report on FS and ICFR audits are issued on the same date. Therefore, in integrated auditing, the audit report lag is the number of calendar days from fiscal year end to the date when the auditor files the FS and ICFR audit reports. In separate auditing, an ICFR auditor and an FS auditor perform the two audits separately and issue the audit reports separately. The audit report dates for these two separate audits are not very likely to be on the same date. From a measurement perspective, the audit efficiency of separate auditing cannot be measured by taking the sum of the two audit report lags. Therefore, we focus on the FS audit, and observe the FS audit report lag in separate auditing.
find that integrated auditing enhances audit effectiveness, and therefore, improves financial reporting quality. We attribute the increased audit effectiveness to knowledge spillover between ICFR and FS audits. Secondly, in addition to furthering the empirical literature on China’s ICFR audit requirement, our study adds to the existing literature on knowledge spillover by identifying a mechanism through which the ICFR audit improves financial reporting quality. Furthermore, we document that such knowledge spillover not only helps improve audit effectiveness but might also enhance FS audit efficiency. Finally, to a certain degree, this study empirically confirms the superiority of integrated auditing and provides a theoretical foundation for the regulatory requirement of integrated auditing. Specifically, our results suggest that integrated auditing improves audit effectiveness and might improve audit efficiency, thereby supporting the choice of integrated auditing.

The remainder of the paper is organised as follows. Section 2 provides institutional background, reviews related literature, and develops hypotheses. Section 3 describes the data and research design, and Section 4 presents the results. Finally, Section 5 concludes with insights for researchers and regulators.

2. Institutional background, prior literature, and hypothesis development

2.1. Institutional background

Although no accounting scandals have drawn a high level of global attention as Enron and WorldCom, fraud is not uncommon among Chinese companies. According to Liscic et al. (2015), the frequency of accounting frauds ranged between 2.2% to 3.94% during 1999 to 2005 in China. The consequences of accounting fraud are costly and disruptive. To discourage accounting fraud, among other regulations to improve transparency of capital markets, China started its formal development of internal control regulations at the beginning of this century. At around the same time in the U.S., a series of high-profile accounting scandals triggered the passage of Sarbanes-Oxley Act (SOX). Since SOX’s passage, numerous academic studies and anecdotal evidence have provided implications for Chinese researchers and regulators. A few years after the enactment of SOX, China started developing its own internal control standards using the COSO’s framework. In 2008, five Chinese governmental departments⁷ jointly issued the Enterprise Internal Control Standard (EICS). With improving financial reporting quality being one of the primary goals, EICS provides regulatory standards for Chinese companies to develop and implement effective internal controls. EICS places an emphasis on internal control over financial reporting (ICFR) and requires management disclosure on the effectiveness of ICFR. The scope of EICS is broader but similar to that of SOX 302 and SOX 404.

Unlike the requirement in the U.S., the audit of ICFR in China does not have to be integrated with the FS audit. Chinese companies are allowed to appoint a different external auditor to perform the ICFR audit separately. While there is a lack of documentation on the rationality of allowing both integrated auditing and separate auditing, such a unique regulation offers an opportunity to empirically examine the consequences of

⁷The five Chinese government departments refer to the Chinese Ministry of Finance, the China Security Regulatory Commission (CSRC), the National Audit Office, the China Banking Regulatory Commission (CBRC), and the China Insurance Regulatory Commission (CIRC).
these two options and to provide evidence testing the ‘assumed’ superiority of integrated auditing. In the following, we attempt to provide possible explanations for the establishment of a standard that allows both integrated auditing and separate auditing. There has been a debate in China on whether the ICFR audit should be integrated with the FS audit or performed separately by a different auditor. Proponents of integrated auditing argue that the ICFR audit should be integrated with the FS audit because the two audits require similar audit procedures regarding the client’s ICFR. Having these two related audit services integrated could help achieve a higher level of audit efficiency via reducing duplicated audit procedures. Proponents of separate auditing believe that, with two audits performed separately, each auditor is able to stay focused on the specific underlying audit objectives. Using such an objective-driven approach is important in maintaining audit quality for each specific type of audit. Although the above reasoning is not data-driven, it might have had an impact on the development of EICS. Additionally, prior to the enactment of EICS, some companies that voluntarily disclosed their ICFR audit reports chose separate auditing. Thus, allowing both integrated auditing and separate auditing in the mandatory regime might have been due to practical reasons (i.e. allowing the continuation of existing separate auditing choices).

Although the vast majority of companies opt for integrated auditing, some choose separate auditing. In 2011, the first year of the mandatory implementation of EICS, three of the 67 cross-listed companies chose separate auditing. In separate auditing, the FS audit and the ICFR audit are conducted independently by two different auditors. Therefore, there are duplication and overlapping of audit procedures between the two auditors. Whereas in integrated auditing, the one external auditor is able to avoid these redundant audit procedures. It is reasonable to expect increased audit efficiency when the FS and ICFR audits are integrated. The phenomenon of separate auditing seems counterintuitive assuming possible benefits of integrated auditing. To understand why some companies chose separate auditing, we identified two public companies that had chosen separate auditing: Company ABC (hereafter ABC) and Company XYZ (hereafter XYZ). Since 2011, ABC has had a national accounting firm for its ICFR audit and an international Big 4 for its FS audit. One author conducted interviews with ABC’s financial officer and a senior audit manager at the international Big 4 who was on ABC’s FS audit engagement team during our sampled period. ABC’s financial officer explained that the decision for separate auditing was made based on the following considerations:

1. to reduce the total audit fees as the international Big 4 charges a higher audit fee;
2. to maintain the existing well-established ‘guanxi’ with the national accounting firm; both ABC’s and the accounting firm’s headquarters are located in Shandong province and this accounting firm provides various audit services to many of ABC’s subsidiaries; and
3. to seek ICFR ‘audit independence’ as the international Big 4 was also the accounting firm that helped ABC to establish its internal control system.

About 34% of the 113 companies in Zhang and Han (2016) chose separate auditing in fiscal year 2008. In our sample that covers the period 2011–2015, the percentage of companies that choose separate auditing is significantly lower. For confidentiality purposes, these two companies and their accounting firms are kept anonymous.
The senior audit manager at the international Big 4 confirmed some of the reasons listed above, such as the local ‘guanxi’ and audit fee considerations. Additionally, the audit manager believed that having a different ICFR auditor might have been a strategy for ABC to gain leverage on the audit fee negotiation.

XYZ had separate auditing from 2012, the first year of its ICFR audit, to 2017. Unlike ABC, XYZ’s FS and ICFR auditors were both Chinese national accounting firms. Therefore, ‘guanxi’ consideration (audit fee consideration) is more (less) likely to be the main driver for choosing separate auditing. According to a securities practitioner who served as an IPO sponsor for XYZ, besides the ‘guanxi’ consideration, a company is more likely to choose a different external auditor for the ICFR audit when its FS auditor’s existing workload is high. In summary, such qualitative evidence suggests that audit fee, guanxi, ICFR audit independence, and FS auditor workload are potential factors that drive the ICFR auditor choice. All three interviewees suggested that there were a wide variety of reasons for making the ICFR auditor choices. There is also empirical evidence that confirms the ‘guanxi’ consideration. For example, Zhang and Han (2016) examine the antecedents of separate auditing using a ‘social network’ (guanxi) perspective. They find that a company that is more concerned about its external relationships with other companies and organisations tends to choose separate auditing. Although it is interesting to explore why some companies choose separate auditing, the determinants of ICFR auditor choice are not addressed in this study. Instead, we focus on two aspects of the consequences of such choice, i.e. audit effectiveness and audit efficiency.

2.2. Literature review and hypothesis development

According to the Public Company Accounting Oversight Board (PCAOB), effective internal control over financial reporting provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes. Assessing the effectiveness of the ICFR is an important part of FS auditing. Therefore, an auditor’s intricate knowledge about a client’s ICFR might improve both effectiveness and efficiency of the FS audit. Previous studies have investigated whether mandatory ICFR audits indeed improve financial reporting quality (e.g. Iliev, 2010; Nagy, 2010; Bhaskar et al., 2019; Lennox & Wu, 2021;McCallen et al., 2022). While Iliev (2010) and Nagy (2010) provide evidence of improved financial reporting quality (i.e. more conservative earnings; reduced material misstatements), Bhaskar et al. (2019) find that the FS-only audits (i.e. without the presence of ICFR audits) are associated with lower likelihood of material misstatement compared to integrated audits (with the presence of ICFR audits). Specifically, Bhaskar et al. (2019) suggest that mandatory ICFR audits harm financial reporting quality. This finding is confirmed by Lennox and Wu (2021). Using a sample of Chinese public companies, Lennox and Wu (2021) suggest that such a negative impact on financial reporting quality is caused by a reduction in adjustments to clients’ pre-audit financial statements when ICFR audits are required.

The studies cited above address an important research issue – whether mandatory ICFR audits improve financial reporting quality. Although more research is needed to address this issue, our study focuses on a different but related question: when ICFR audits are mandated, is integrated auditing superior to separate auditing? Specifically, in this study, we examine the superiority by comparing FS audit effectiveness and FS audit efficiency.
between integrated auditing and separate auditing. Because separate auditing only exists in China, there is a lack literature on comparisons of integrated auditing and separate auditing. Up to this date, only two studies (i.e. Zhang & Han, 2016; Gunn et al., in press) have empirically examined the consequences of integrated and separate auditing. Gunn et al. (in press) extended Bhaskar et al. (2019)'s research on integrated FS audit quality, which suggests that increased opportunities for judgement-based integration issues in integrated auditing negatively affect FS audit quality. From a legislative perspective, Zhang and Han (2016) hypothesise that ‘separate auditing’ improves FS audit quality because the separation of powers can strengthen the government’s oversight. Different from the above studies, our hypotheses are based on the theory of knowledge spillover. When ICFR and FS audits are integrated, we expect knowledge spillover to improve both audit effectiveness and audit efficiency.

2.2.1. Audit effectiveness

Prior literature has documented knowledge spillover due to synergies and knowledge transfers between NAS and audit services. Although the ICFR audit is not a NAS, in China, it is treated as a separate service from the FS audit. The literature on joint provision of NAS and audit services provides insight for our study. Simunic (1984) suggests that some NAS improve audit effectiveness through knowledge spillover. Knowledge of a client’s tax accounting might spill over to the audit and improve audit quality, and that in turn would increase financial reporting quality (Gleason & Mills, 2011; Kinney et al., 2004; Robinson, 2008). By performing NAS, auditors can enrich their client-specific knowledge, which in turn improves audit effectiveness (Beck & Wu, 2006). IS-related consulting services improve the auditor’s knowledge base and therefore lead to improved audit/financial reporting quality (Koh et al., 2013). Since effective ICFR can help ensure reliable financial reporting, it is plausible to expect the knowledge spillover effect between FS and ICFR audits. If such knowledge spillover exists, then audit effectiveness would be improved when ICFR and FS audits are integrated and provided by the same external auditor. An auditor’s possessing deep knowledge about its client’s internal control could improve the FS audit effectiveness, which results in less earnings management and higher financial reporting quality. Consistent with studies cited above, we assume that audit effectiveness has a positive relationship with financial reporting quality. Therefore, we state our first hypothesis as follows:

H1: Compared to Chinese companies that choose separate auditing, companies that choose integrated auditing exhibit higher financial reporting quality.

2.2.2. Audit efficiency

Bamber et al. (1993) define efficiency as ‘the use of fewer inputs to obtain a given output’ (page 2). Besides improved audit effectiveness, improved audit efficiency can also be achieved through knowledge spillover. For example, Knechel and Sharma (2012) suggest that joint provision of NAS and audit services yield audit efficiency because the auditor accumulates client-specific knowledge and expertise. Using the same logic, the FS auditor gains a greater level of familiarity with its client’s ICFR if it also performs the ICFR audit. Such client-specific knowledge would help improve
audit efficiency by avoiding duplication and overlapping of audit procedures. Therefore, based on the theory of knowledge spillover, our second hypothesis is stated as follows:

**H2: Compared to Chinese companies that choose separate auditing, companies that choose integrated auditing exhibit higher audit efficiency.**

### 3. Research design

#### 3.1. Data and sample

We collect data regarding accounting, financial statement audits, and ICFR audits from the China Stock Market & Accounting Research (CSMAR) database. The internal control index data is collected from DIB Internal Control and Risk Management database. Because the staged mandatory implementation of EICS began in 2011, our sample covers year 2011 to 2015. Sample selection, sample distributions by year, and sample distributions by industry are provided in Panel A, B, C of Table 1, respectively. Our initial sample consists of 10,942 firm-year observations from all public companies that disclosed ICFR audit reports during fiscal/calendar years 2011–2015. After deleting 266 observations in the financial industry and 3,649 observations that do not have required data, our sample reduces to 7,027 firm-year observations, of which 158 observations represent separate auditing. Note that the number of observations in 2011 is significantly lower because that year was the first year of mandatory implementation of EICS. After 2011, more and more companies were required to implement EICS. The final sample covers 16 major industry sectors, of which more than half of the sampled firms are manufacturers.

#### 3.2. Financial reporting quality

FS auditing enhances reliability of information contained in financial statements for intended users and ensures financial reporting quality. Effective FS auditing helps constrain earnings management. In this study, we use the level of earnings management as an indicator of financial reporting quality. Following previous studies that examine the earnings management using Chinese data (Chen & Yuan, 2004; Gul et al., 2009; Cang et al., 2014; Fan et al., 2015), we measure earnings management by ‘excess non-operating income’ (ENOI). While accrual measures are commonly used in the U.S., as suggested in Chen and Yuan (2004), excess non-operating income might be a better alternative to measure earnings management among Chinese companies.

We select our control variables based on prior research on earnings management phenomenon in China (e.g. Cheng et al. 2015; Fan et al., 2015; Gul et al., 2017). We include company size (Size), financial risk (Lev), financial distress (Loss), growth in sales (Growth), book-to-market ratio (BTM), operating cash flows (OCF), internal control effectiveness (ICIndex), auditor quality (Bigauditor and Specialist), a dummy variable indicating whether a company is state-owned (SOE), complexity of a company (Complexity), and
whether a company reports its ICFR report mandatorily or voluntarily (Mandatory). Industry effects and year effects are also controlled. To test H1, we estimate the following regression model:

$$ENOI = \alpha_0 + \alpha_1 Integrate + \alpha_2 Size + \alpha_3 Lev + \alpha_4 Loss + \alpha_5 Growth + \alpha_6 BTM + \alpha_7 OCF + \alpha_8 ICIIndex + \alpha_9 Bigauditor + \alpha_{10} Specialist + \alpha_{11} SOE + \alpha_{12} Complexity + \alpha_{13} Mandatory + Industry effects + Year effects + \epsilon$$

(1)
3.3. **Audit efficiency**

Bamber et al. (1993) define efficiency as ‘the use of fewer inputs to obtain a given output’. In this research context, the given output refers to completed ICFR and FS audits. There are two options to obtain such an output: (1) one auditor performs both ICFR and FS audits and achieves the objectives of the two audits simultaneously, and (2) two auditors share the workload and achieve the objectives of the two audits separately. Since we are not able to directly measure the inputs required to complete an audit, we follow prior literature (e.g. Bailey et al., 2018; Bamber et al., 1993; Knechel & Payne, 2001; Knechel & Sharma, 2012; Masli et al., 2010) and use audit report lag to measure audit efficiency. In this study, the audit report lag in integrated auditing measures the audit efficiency for both FS and ICFR audits. In separate auditing, it is not possible to use a single audit report lag measure for both audits because FS and ICFR audits are conducted separately by two different auditors. The audit report lag in separate auditing refers to the number of calendar days from fiscal year end to the date when the FS audit report is filed. Therefore, the observed audit report lag in separate auditing captures time used to complete both FS and ICFR audits, while the observed audit report lag in separate auditing only captures the time used to complete the FS audit.

Although the integrated auditor’s knowledge about a client’s ICFR would improve audit efficiency and therefore reduce the total time needed to complete the audit work compared to the separate FS auditor, the integrated auditor has a higher workload. Increased workload and improved audit efficiency have opposite effects on audit report lag, which makes it more complex to use audit report lag to test the audit efficiency hypothesis. When the observed audit report lag in integrated auditing is longer than that of the FS audit in separate auditing, a conclusion is not warranted. That is because even if integrated auditing improves audit efficiency, such an improved audit efficiency might not fully offset the effect of the increased workload on audit report lag. However, if the observed audit report lag in integrated auditing is shorter than or not different from that of the FS audit in separate auditing, there is evidence to conclude that integrated auditing improves audit efficiency. This is because the integrated auditor is able to complete two audits in more or as timely manner as the FS auditor (in separate auditing) to complete one audit. Therefore, H2 will be supported if the observed audit report lag in integrated auditing is not longer than that for the FS audit in separate auditing. Our dependent variable is audit report lag (**AudLag**). Following Sharma et al. (2017) and Bailey et al.
we include Size, Lev, ARINV, Complexity, Loss, ROA, Bigauditor, Specialist, ICIndex, CleanOpn, and Mandatory as control variables. We also control year and industry effects. Therefore, to test H2, we estimate the following regression:

\[
\text{AudLag} = \gamma_0 + \gamma_1 \text{Integrate} + \gamma_2 \text{Size} + \gamma_3 \text{Lev} + \gamma_4 \text{ARINV} + \gamma_5 \text{Complexity} + \gamma_6 \text{Loss} + \gamma_7 \text{ROA} + \gamma_8 \text{Bigauditor} + \gamma_9 \text{Specialist} + \gamma_{10} \text{ICIndex} + \gamma_{11} \text{CleanOpn} + \gamma_{12} \text{Mandatory} + \text{Industry effects} + \text{Year effects} + \epsilon
\]  

The dependent variable, AudLag, is the natural log of the number of calendar days from fiscal year-end to the date when the auditor files the audit report (FS audit report in separate auditing). Integrate is our interest variable and is equal to 1 for integrated auditing, and 0 otherwise. ARINV is the percentage of accounts receivable and inventory in total assets. ROA is measured by operating earnings before tax divided by average total assets. CleanOpn is a dummy variable which is equal to 1 if a company received an unqualified audit opinion. All other variables are as defined in Equation (1).

As discussed earlier, based on the theory of knowledge spillover, we expect that integrated auditing helps improve audit efficiency. Instead of measuring audit efficiency directly, we observe audit report lag. If the observed audit report lag in integrated auditing the same as or shorter than that of the FS audit in separate auditing, there is evidence that integrated auditing improves audit efficiency. Therefore, we expect \( \gamma_1 \) to be either insignificant (improved audit efficiency effect fully offsets the increased workload effect) or significantly negative (improved audit efficiency effect outweighs the increased workload effect).

4. Empirical results

4.1. Descriptive statistics

Table 2 reports descriptive statistics of the variables used in this study. Of the 7,027 observations, 6,869(97.8%)/158(2.2%) observations represent integrated/separate auditing (Integrate). The mean excess non-operating income (ENOI) is about 1.1% of total stockholders’ equity. On average, it takes about 92 days to complete a FS audit (the mean AudLag = 4.503) Approximately 57.2% of total sample represent mandatory ICFR auditing (Mandatory). The mean Size is 22.212. The average total accounts receivable and inventory to total assets (ARINV) is 26.5%. The mean debt ratio (Lev) is about 44.7%. 8.8% of observations show a net loss (Loss). The average ROA is 4.0%. The average operating cash flow to total assets (OCF) is 4.7%. Book-to-market ratio (BTM) has a mean of 0.545. About half of the observations (50.3%) represent state-owned enterprises (SOE). The mean complexity score is 2. About 73.1% of observations have either an international Big 4 or a Chinese national Big 10 as the FS auditor (BigAuditor). About 35.8% of the observations have an industry specialist as their FS auditor (Specialist). The average ICIndex score is 25.47. 99.7% of the observations received an unqualified audit opinion (CleanOpn).

\[\text{Only } 6.8\% \text{ of the } 7,027 \text{ firm-year observations have an international Big 4 as the financial statement auditor; while } 66.3\% \text{ have a Chinese national Big 10 as the financial statement auditor.} \]
Table 2. Descriptive statistics.

| Variable     | Mean   | Median | Std. Dev. | Minimum | Maximum |
|--------------|--------|--------|-----------|---------|---------|
| Integrate    | 0.978  | 1.000  | 0.148     | 0.000   | 1.000   |
| ENOI         | 0.011  | 0.006  | 0.015     | 0.000   | 0.058   |
| AudLag       | 4.503  | 4.489  | 0.203     | 4.040   | 4.760   |
| Mandatory    | 0.572  | 1.000  | 0.495     | 0.000   | 1.000   |
| Bigauditor   | 0.731  | 1.000  | 0.443     | 0.000   | 1.000   |
| Specialist   | 0.358  | 0.000  | 0.479     | 0.000   | 1.000   |
| CleanOpn     | 0.997  | 1.000  | 0.058     | 0.000   | 1.000   |
| ICIndex      | 25.473 | 25.997 | 3.168     | 0.000   | 31.549  |
| Size         | 22.121 | 22.024 | 1.212     | 20.403  | 24.781  |
| ARINV        | 0.265  | 0.242  | 0.167     | 0.031   | 0.625   |
| Lev          | 0.447  | 0.450  | 0.208     | 0.101   | 0.796   |
| Loss         | 0.088  | 0.000  | 0.283     | 0.000   | 1.000   |
| ROA          | 0.040  | 0.034  | 0.046     | −0.046  | 0.135   |
| OCF          | 0.047  | 0.046  | 0.070     | −0.090  | 0.180   |
| Growth       | 0.113  | 0.082  | 0.245     | −0.282  | 0.724   |
| BTM          | 0.545  | 0.525  | 0.248     | 0.159   | 0.995   |
| SOE          | 0.503  | 1.000  | 0.500     | 0.000   | 1.000   |
| Complexity   | 2.000  | 2.000  | 0.780     | 1.000   | 5.000   |

Variable definitions appear in Appendix A.

4.2. Correlations

Table 3 provides the Pearson correlations of all the variables used in this study. Integrates is negatively correlated with ENOI, Bigauditor, Size, Lev, Loss, BTM, SOE, Complexity, and Mandatory. Integrates is positively correlated with ICIndex, ROA, Growth, and ARINV. As expected, Specialist, CleanOpn, ICIndex, ROA, OCF, and Growth are negatively correlated with ENOI, while Lev, Loss, SOE, Complexity, and Mandatory are positively correlated with ENOI. The variables that are positively correlated with AudLag are Specialist, Size, Lev, Loss, BTM, ARINV, Complexity, and Mandatory. CleanOpn, ICIndex, ROA, OCF, Growth, and SOE are negatively correlated with AudLag.

4.3. Propensity score matching sample

As described earlier, of the 7,027 firm-year observations, only 158 represent separate auditing. This imbalanced and small sample size of companies that choose separate auditing may bias our inferences. To address this concern as well as the selection bias, we use a propensity score matching (PSM) sample. Additionally, we exclude companies that are listed on SME and GEM boards. Therefore, the PSM sample only include 137 pairs that are traded on the main board to ensure that all observations represent ICFR audits. For each separate auditing case (Integrate = 0), we select one case from the integrated auditing sample (Integrate = 1) using the nearest-neighbour approach without replacement.\(^\text{11}\) Table 4 presents the results of bi-variate analysis using the full sample and the PSM sample in Panel A and Panel B, respectively.

\(^{11}\)Using the nearest-neighbour approach with replacement and 0.03 caliper matching approach with/without replacement yields similar results for the audit effectiveness analysis. For the audit efficiency analysis, the caliper matching approach yields slightly weaker result.
Table 3. Correlations.

Panel A: Correlations (ENOI to Lev)

|       | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. ENOI | 1   |     |     |     |     |     |     |     |     |
| 2. AudLag | -0.007 |     |     |     |     |     |     |     |     |
| 3. Integrate | -0.091*** | 0.011 |     |     |     |     |     |     |     |
| 4. Bigauditor | -0.017 | -0.002 | -0.025* |     |     |     |     |     |     |
| 5. Specialist | -0.031* | 0.032** | 0.019 | 0.444*** |     |     |     |     |     |
| 6. CleanOpn | -0.036** | -0.056*** | 0.008 | 0.003 | -0.007 |     |     |     |     |
| 7. ICIndex | -0.110*** | -0.068*** | 0.036 | 0.048*** | 0.017 | 0.220*** |     |     |     |
| 8. Size | -0.009 | 0.058*** | -0.079*** | 0.124*** | -0.007 | 0.015 | 0.127*** |     |     |
| 9. Lev | 0.214*** | 0.052*** | -0.055*** | 0.02† | -0.056*** | -0.022† | -0.051*** | 0.552*** | 1   |
| 10. Loss | 0.098*** | 0.080*** | -0.055*** | -0.001 | -0.004 | -0.051*** | -0.271*** | -0.026* | 0.162*** |
| 11. ROA | -0.298*** | -0.114*** | 0.058*** | 0.026* | 0.035** | 0.050*** | 0.264*** | -0.027* | -0.393*** |
| 12. OCF | -0.050*** | -0.085*** | 0 | 0.049*** | 0.049*** | 0.019† | 0.126*** | 0.064*** | -0.146*** |
| 13. Growth | -0.061*** | -0.076*** | 0.038** | 0.016 | 0.008 | 0.029* | 0.168*** | 0.007 | 0.007 |
| 14. BTM | 0.008 | 0.028* | -0.024* | 0.046*** | -0.072*** | 0.002 | 0.069*** | 0.625*** | 0.514*** |
| 15. ARINV | -0.027* | 0.034** | -0.026* | -0.035** | -0.024* | -0.001 | 0.017 | 0.016 | 0.444*** |
| 16. SOE | 0.114*** | -0.033** | -0.064*** | 0.047*** | -0.060*** | -0.005 | 0.004 | 0.375*** | 0.347*** |
| 17. Complexity | 0.150*** | 0.026** | -0.055*** | 0.073*** | 0.003 | -0.013 | -0.005 | 0.332*** | 0.211*** |
| 18. Mandatory | 0.125*** | 0.046*** | -0.087*** | 0.005 | -0.045*** | -0.001 | -0.076*** | 0.421*** | 0.376*** |

Panel B: Correlations (Loss to Mandatory)

|       | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 10. Loss | 1   |     |     |     |     |     |     |     |     |
| 11. ROA | -0.499*** | 0.418*** |     |     |     |     |     |     |     |
| 12. OCF | -0.183*** | 0.279*** | 0.085*** |     |     |     |     |     |     |
| 13. Growth | -0.214*** | 0.265*** | -0.093*** | 0.103*** |     |     |     |     |     |
| 14. BTM | 0.027* | -0.082*** | -0.345*** | -0.079*** | 0.009 | 1   |     |     |     |
| 15. ARINV | -0.029* | -0.162*** | 0.004 | -0.149*** | 0.379*** | -0.082*** | 1   |     |     |
| 16. SOE | 0.078*** | -0.158*** | -0.032** | 0.316*** | 0.132*** | -0.016 | 0.095*** | 1   |     |
| 17. Complexity | 0.193*** | -0.055*** | 0.003 | 0.211*** | 0.278*** | -0.074*** | 0.557*** | 0.089*** | 1   |
| 18. Mandatory | 0.106*** | -0.180*** | -0.006 | -0.288*** | 0.132*** | 0.003 | 0.123*** | 0.016 | 0.095*** |

Variable definitions appear in Appendix A.

†, *, **, *** denotes significance level at 10%, 5%, 1%, 0.1% respectively (two-tailed).
The bi-variate analysis using the full sample shows that ENOI is lower in integrated auditing than in separate auditing but there is no significant difference in AugLag between integrated auditing and separate auditing. As also shown in Panel A, the full sample bi-variate analysis shows significant differences in Size, Lev, Loss, Growth, BTM, ICIndex, Bigauditor, Specialist, Mandatory, SOE, Complexity, ARINV, and ROA between integrated auditing and separate auditing.

The bivariate analysis of ENOI using the PSM sample is consistent with that using the full sample. Additionally, as shown in Panel B in Table 4, AudLag of integrated auditing is significantly lower than that of the FS audit in separate auditing. That means, on average, companies choosing integrated auditing experience a shorter audit report lag. The bivariate analysis result using the PSM sample is consistent with our expectation.
Table 5. Regression results.

Panel A: Audit Effectiveness/Financial Reporting Quality (Dependent Variable: ENOI)

| Variable   | Coef. | t-stat | Coef.     | t-stat | Coef. | t-stat | Coef.     | t-stat |
|------------|-------|--------|-----------|--------|-------|--------|-----------|--------|
| Integrate  | -0.066| -5.896***| -0.049 | -3.297***| -0.051 | -2.918**| -0.156 | -3.008**|
| Size       | -0.207| -10.903***| -0.272 | -11.597***| -0.03 | -1.165| -0.168 | -1.901†|
| Lev        | 0.351 | 23.080***| 0.335 | 18.725***| 0.267 | 11.123***| 0.255 | 3.994***|
| Loss       | -0.063| -4.953***| -0.074 | -4.521***| -0.02 | -1.065| -0.043 | -0.783|
| Growth     | -0.110| -8.442***| -0.097 | -5.917***| -0.12 | -5.827***| -0.092 | -1.612|
| BTM        | -0.095| -5.213***| -0.065 | -2.760***| -0.117 | -4.282***| -0.132 | -1.486|
| OCF        | -0.008| -0.705 | -0.019 | -1.168 | 0 | 0 | -0.034 | -0.602|
| ICIndex    | -0.061| -4.935***| -0.047 | -3.054** | -0.048 | -2.555* | 0.003 | 0.051|
| Bigauditor | -0.004| -0.349 | -0.349 | -4.024 | 0.011 | 0.548 | 0.093 | 1.656†|
| Specialist | -0.018| -1.403 | -0.011 | -0.659 | -0.039 | -1.924† | -0.064 | -1.230|
| SOE        | 0.031 | 2.136** | 0.018 | 1.127 | 0.054 | 2.809*** | 0.028 | 0.503|
| Complexity | 0.204 | 15.355***| 0.22 | 12.270***| 0.175 | 8.532*** | 0.136 | 2.162*|
| Voluntary  | 0.085 | 5.440***| 2.709** | 2.300***| 20.57** | 0.05 | 2.595** | 0.021 | 0.256|
| Industry effects | | | | | | | | |
| Year effects | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 7,027 | 4,019 | 3,008 | 274 |
| Adj. R²       | 0.195% | 17.70% | 10.10% | 36.50% |

Panel B: Audit Efficiency (Dependent Variable: AudLag)

| Variable   | Coef. | t-stat | Coef.     | t-stat | Coef. | t-stat | Coef.     | t-stat |
|------------|-------|--------|-----------|--------|-------|--------|-----------|--------|
| Integrate  | 0.019 | 1.632 | 0.014 | 0.895 | 0.038 | 2.095** | -0.191 | -3.167**|
| Size       | 0.098 | 5.664***| 0.114 | 5.371***| 0.101 | 3.961***| 0.021 | 0.256|
| Lev        | -0.054 | -3.058** | -0.03 | -1.426 | -0.084 | -3.107**| 0.071 | 0.886|
| ARINV      | 0.052 | 3.516***| 0.039 | 1.874† | 0.086 | 4.055***| -0.107 | -1.488|
| Complexity | -0.019 | -1.442 | -0.018 | -0.968 | -0.018 | -0.947 | 0.049 | 0.701|
| Loss       | 0.028 | 2.032** | 0.011 | 0.6 | 0.05 | 2.423* | 0.125 | 1.752†|
| ROA        | -0.093 | -6.025***| -0.086 | -4.161***| -0.087 | -3.782***| 0.023 | 0.298|
| Bigauditor | -0.020 | -1.487 | -0.034 | -1.898† | -0.001 | -0.061 | -0.001 | -0.003|
| Specialist | 0.035 | 2.595** | 0.032 | 1.822† | 0.046 | 2.191* | 0.166 | 2.709***|
| CleanOPN   | -0.036 | -2.741** | -0.033 | -1.926† | -0.041 | -1.916† | -0.111 | -1.716†|
| Mandatory  | -0.030 | -20.57***| -0.027 | -1.741† | -0.047 | -2.566** | -0.022 | -0.360|
| Industry effects | | | | | | | | |
| Year effects | Included | Included | Included | Included | Included | Included | Included | Included |
| Observations | 7,027 | 4,019 | 3,008 | 274 |
| Adj. R²       | 4.20% | 4.40% | 4.20% | 11.20% |

Variable definitions appear in Appendix A.
†, *, **, *** denotes significance level at 10%, 5%, 1%, 0.1% respectively (two-tailed).

4.4. Multiple regression results: audit effectiveness (financial reporting quality)

Following Chen and Yuan (2004), Gul et al. (2009), Cang et al. (2014), and Fan et al. (2015), we use the absolute value of excess non-operating income (ENOI) to proxy for financial reporting quality. We run the regression model specified in Equation (1) for the full sample, two sub-samples that represent mandatory ICFR auditing and voluntary ICFR auditing, and the PSM sample. Regression results to test H1 for the full sample, mandatory auditing sample, voluntary auditing sample, and PSM sample are presented in Table 5 Panel A. The coefficient on Integrate is negative and statistically significant for all the four samples. That is, after controlling for other factors, companies choosing integrated auditing report lower excess non-operating income (earnings management). Thus, integrated auditing seems to improve financial reporting quality through enhanced audit
effectiveness. This result supports H1 and differs from that documented in Gunn et al. (in press) and Zhang and Han (2016). It is not to our surprise that our result is different from Zhang and Han (2016) due to significant changes in the institutional background. With more guidance and more practice on implementing EICS, ICFR audits have become more normalised. Additionally, external auditors have gained more experience and knowledge in conducting the ICFR audit. Therefore, it is reasonable to expect an improved audit effectiveness in more recent years. Although the sample period in our study overlaps with that in Gunn et al. (in press), the results regarding FS audit quality are different. Such difference is likely due to different FS audit quality measures used in the two studies. While we capture audit effectiveness indirectly via measuring 'earnings management', Gunn et al. (in press) use an ex-post indicator to measure FS audit quality directly.

Finally, the coefficients on Lev and Complexity, are statistically significant across all four samples. Coefficients on Growth, BTM, ICIndex, and SOE are significant for full, mandatory, and voluntary samples. These results indicate that while state-owned companies (SOE) with a higher debt ratio (Lev) and a higher level of complexity (Complexity) report higher excess non-operating income, undervalued companies (BTM) with a higher sales growth rate (Growth) and higher internal control quality (ICIndex) report lower excess non-operating income.

4.5. Multiple regression results: audit efficiency

As stated earlier, we compare audit report lag (AudLag) between integrated auditing and FS audit in separate auditing to test H2. H2 will be supported if AudLag for integrated auditing is not longer than (i.e. either not different from or shorter than) that for the FS audit in separate auditing. We run the regression model specified in Equation (2) for the full, mandatory, voluntary, and PSM samples. Regression results are reported in Table 5 Panel B. The coefficient on Integrate is insignificant for the full sample. Because improved efficiency and increased workload have opposite effects on audit report lag, such a result potentially suggests increased audit efficiency in integrated auditing.

While the coefficient on Integrate for the mandatory sample is insignificant (p-value = 0.371), it is significantly positive (p-value = 0.036) for the voluntary sample. These results suggest that, for Chinese companies that are required to have their ICFR audited, it does not take more time for the integrated auditors to complete two audits than the FS auditors in separate auditing to complete one audit. In other words, the integrated auditors of the mandatory companies are able to complete the audit work more efficiently. For companies that voluntarily have their ICFR audited, the integrated auditors spend more time to complete two audits than the FS auditors in separate auditing to complete one audit. Such a result does not warrant a conclusion. It is possible that integrated auditing improves audit efficiency, but the increased efficiency is not large enough to offset the effect of the increased workload on audit report lag. It is also possible that integrated auditing does not improve audit efficiency. Therefore, the integrated auditors of voluntary companies may or may not complete the audit work more efficiently. The testing results using mandatory and voluntary sub-samples are inconsistent.

The coefficient on Integrate for the PSM sample is negative and significant. Specifically, the audit report lag in integrated auditing is significantly shorter than that of the FS audit in integrated auditing. That means, even with a higher workload, the integrated auditor is
able to complete two audits in a more or as timely manner as FS auditor in separate auditing to complete one audit. Therefore, the result using the PSM sample supports H2 and suggests that integrated auditing improves audit efficiency. In the propensity score matching process, we identify Mandatory as one of the predictors for the choice of integrated vs. separate auditing. Whether a company is mandated to implement EICS seems to impact the consequences of integrated auditing vs. separate auditing. Once we address this endogeneity issue using a matched sample, the coefficient on Integrate becomes negative and significant. Furthermore, the bivariate analysis and multiple regression analysis results using the PSM sample are consistent. The propensity score matching addresses the issues caused by severely imbalanced samples and potentially address the endogeneity. Therefore, we consider the results using the PSM sample more reliable.

Note that our result regarding FS audit efficiency is different from that in Gunn et al. (in press). While we find that the FS audit is more efficient in the integrated auditing setting than in the separate auditing setting, Gunn et al. (in press) suggest the opposite. We believe that such a difference is likely due to different audit efficiency measures used in these two studies. As mentioned earlier, audit reporting lag might be a ‘noisy’ measure for audit efficiency.

Finally, the coefficients on Specialist are statistically significant across all four samples. Coefficients on Size, ROA, ICIndex, and CleanOpn are statistically significant for the full, mandatory, and voluntary samples. Interestingly, industry specialists (Specialist) seem to use more time to conduct FS audits. This result is consistent with Abidin and Ahmad-Zaluki (2012). Although an industry specialist’s industry expert knowledge would result in higher audit efficiency in auditing clients in a given industry, it might also have a higher audit workload due to the high market share in that industry. Such higher workload might cause a longer audit delay. Consistent with our expectations, larger companies (Size) experience a longer audit delay while companies with higher internal control quality (ICIndex) experience a shorter audit delay. Audit report lag is shorter for companies that receive an unqualified audit opinion (CleanOpn).

4.6. Sensitivity analysis: alternative measure for earnings management

In summary, results using the PSM sample suggest that integrated auditing yields higher audit effectiveness (financial reporting quality) and higher audit efficiency. We interpret such results as the effects of knowledge spillover associated with integrated auditing.

In addition to using a PSM sample as a sensitivity analysis, we use performance matched discretionary accruals (DA) to measure earnings management. Specifically, DA is measured as the absolute value of residuals from cross-sectional estimation of the industry-year matched on performance (i.e. ROA) in year t-1. The results (not tabulated) are similar to, but somewhat weaker than, those reported in Table 5 Panel A when ENOI is used as a proxy for earnings management. This could be due to high levels of error in estimates of abnormal accruals as documented in Chen and Yuan (2004).
5. Conclusion, limitations, and future research

In this study, we attempt to compare audit effectiveness and audit efficiency between companies that have integrated auditing of internal control over financial reporting (ICFR) and financial statements and companies that have separate auditing. Compared to companies that choose separate auditing, companies that have the same auditor for both FS and ICFR audits exhibit a lower level of excess non-operating income, an indicator of financial reporting quality. Such a result seems to suggest that integrated auditing improves audit effectiveness, which is an outcome of knowledge spillover. We also document limited evidence suggesting that integrated auditing is likely to improve audit efficiency. Collectively speaking, integrated auditing seems to be superior to separate auditing. Perhaps, that could explain the pervasiveness of integrated auditing and that the number of companies that choose separate auditing has been decreasing since 2015. Our study contributes to the literature by providing additional empirical evidence on the consequences of integrated auditing vs. separate auditing. According to our results, integrated auditing seems to enhance audit effectiveness and might improve audit efficiency. Such findings confirm the effect of knowledge spillover when ICFR and FS audits are integrated.

While providing important insights for researchers and regulators, the current study is subject to the following major limitations. First of all, to the best of our knowledge, China is the only country in the world that allows separate auditing. Thus, while our study provides opportunity to test theory/practice, it has limited generalisability. Secondly, in this study, we focus on the consequences of integrated auditing vs. separate auditing. We only provide limited qualitative evidence to explain why some companies choose separate auditing. Future research can expand the understanding of determinants of ICFR auditor choice. Thirdly, the sample period covers five years (i.e. 2011–2015) from the beginning year of ICFR mandatory implementation. The primary reason to choose 2011–2015 as our sample period is that, although never a popular choice, separate auditing was the most ‘pervasive’ during that time. After 2015, the number of companies that choose separate auditing begins to decrease. Additionally, since 2015, all main board companies have implemented EICS, and the institutional background has changed as well. Nonetheless, future research could examine a period after all main board companies have implemented EICS. Finally, the research methodology is subject to multiple flaws. For example, earnings management (measured by excess non-operating income) is an indirect measure for the FS audit quality. Excess non-operating income is likely to have noises and biases. Audit report lag might be a ‘noisy’ measure for audit efficiency. Given our results regarding FS audit effectiveness and efficiency are different from Gunn et al. (in press), caution should be exercised when interpreting these results. Additionally, while the difference in non-operating income is statistically significant, the effect size might be too small (Cohen’s d = 0.17) to demonstrate the importance of this finding. In analysing audit report lag, the results of using different samples are inconsistent. Specifically, H2 is supported when using the full sample, mandatory sub-sample, and the PSM sample but is not supported using the voluntary sample. Although we consider the results using the PSM sample more reliable, once again, caution should be exercised when interpreting these results. Such a matching approach has its limitations. As suggested in Shipman et al. (2017), ‘PSM does not address most concerns relating to self-selection or endogeneity’ (page 216). The findings using the PSM sample might be sensitive to PSM design choices.
Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

Qiaoling Fang would like to acknowledge financial support from National Natural Science Foundation of China (72172144).

References

Abidin, S., & Ahmad-Zaluki, N. (2012). Auditor industry specialization and reporting timeliness. *Procedia - Social and Behavioral Sciences, 65*(3), 873–878. https://doi.org/10.1016/j.sbspro.2012.11.213

Bailey, C., Collins, D.L., & Abbott, L.J. (2018). The impact of enterprise risk management on the audit process: Evidence from audit fees and audit delay. *Auditing: A Journal of Practice & Theory, 37*(3), 25–46. https://doi.org/10.2308/ajpt-51900

Bamber, E.M., Bamber, L.S., & Schoederbek, M.P. (1993). Audit structure and other determinants of audit report lag: An empirical analysis. *Auditing: A Journal of Practice and Theory, 12*(1), 1–23.

Beck, P.J., & Wu, M.G.H. (2006). Learning by doing and audit quality. *Contemporary Accounting Research, 23*(1), 1–30. https://doi.org/10.1506/AU4-Q7Q9-3YAB-4QE0

Bhaskar, L., Schroeder, J., & Shepardson, M. (2019). Integration of internal control and financial statements audits: Are two audits better than one? *The Accounting Review, 94*(2), 53–81. https://doi.org/10.2308/accr-52197

Cang, Y., Chu, Y., & Lin, T.W. (2014). An exploratory study of earnings management detectability, analyst coverage and the impact of IFRS adoption: Evidence from China. *Journal of Accounting and Public Policy, 33*(4), 356–371. https://doi.org/10.1016/j.jaccpubpol.2014.04.003

Chen, K., & Yuan, H. (2004). Earnings management and capital resource allocation: Evidence from China’s accounting-based regulation of rights issues. *The Accounting Review, 79*(3), 645–665. https://doi.org/10.2308/accr.2004.79.3.645

Cheng, C.S.A., Wang, J., & Wei, S.X. (2015). State ownership and earnings management around initial public offerings: Evidence from China. *Journal of International Accounting Research, 14*(2), 89–116. https://doi.org/10.2308/jiar-51193

Christensen, B., Olson, A., & Omer, T. (2015). The role of audit firm expertise and knowledge spillover in mitigating earnings management through the tax accounts. *The Journal of the American Taxation Association, 37*(1), 3–36. https://doi.org/10.2308/atax-50906

Fan, Y., Thomas, W.B., & Wang, C. (2015). The effect of regulatory benchmarks on firm reporting behavior. *Journal of International Accounting Research, 14*(1), 85–107. https://doi.org/10.2308/jiar-51077

Gleason, C., & Mills, L. (2011). Do auditor-provided tax services improve the estimate of tax reserves? *Contemporary Accounting Research, 28*(5), 1484–1509. https://doi.org/10.1111/j.1911-3846.2010.01057.x

Gul, F.A., Ma, S., & Lai, K. (2017). Busy auditors, partner-client tenure, and audit quality: Evidence from an emerging market. *Journal of International Accounting Research, 16*(1), 83–105. https://doi.org/10.2308/jiar-51706

Gul, F.A., Ma, S., Sami, H., & Zhou, H. (2009). Auditor disaffiliation program in China and auditor independence. *Auditing: A Journal of Practice & Theory, 28*(1), 29–51. https://doi.org/10.2308/aud.2009.28.1.29

Gunn, J., Chan, C., Liao, L., & Zhou, S. (in press). Is it better to kill two birds with one stone? Internal control audit quality and audit costs for integrated vs. non-integrated audits. *The Accounting Review. https://doi.org/10.2308/TAR-2019-0220*

Iliev, P. (2010). The effect of SOX section 404: Costs, earnings quality, and stock prices. *The Journal of Finance, 65*(3), 1163–1196. https://doi.org/10.1111/j.1540-6261.2010.01564.x
Kinney, W., Jr, Palmrose, Z., & Scholz, S. (2004). Auditor independence, non-audit services, and restatements: Was the US Government right? Journal of Accounting Research, 42(3), 561–588. https://doi.org/10.1111/j.1475-679X.2004.011-00141.x

Knechel, W.R., & Payne, J.L. (2001). Additional evidence on audit report lag. Auditing: A Journal of Practice and Theory, 20(1), 137–146. https://doi.org/10.2308/aud.2001.20.1.137

Knechel, W.R., & Sharma, D. (2012). Auditor-provided non-audit services and audit effectiveness and efficiency: Evidence from pre and post SOX audit report lags. Auditing: A Journal of Practice and Theory, 31(4), 85–114. https://doi.org/10.2308/ajpt-10298

Koh, K., Rajgopal, S., & Srinivasan, S. (2013). Non-audit services and financial reporting quality: Evidence from 1978–1980. Review of Accounting Studies, 18(1), 1–33. https://doi.org/10.1007/s11142-012-9187-6

Krishnan, G.V., & Visvanathan, G. (2011). Is there an association between earnings management and auditor-provided tax services? The Journal of the American Taxation Association, 33(2), 111–135. https://doi.org/10.2308/atax-10055

Krishnan, G.V., & Yu, W. (2011). Further evidence on knowledge spillover and the joint determination of audit and non-audit fees. Managerial Auditing Journal, 26(3), 230–247. https://doi.org/10.1108/2068690111113181

Lennox, C., & Wu, X. (2021). Mandatory internal control audits, audit adjustments, and financial reporting quality: Evidence from China. The Accounting Review, 97(1), 341–364. https://doi.org/10.2308/TAR-2020-0152

Lisic, L.L., Silveri, S., Song, Y., & Wang, K. (2015). Accounting fraud, auditing and the role of government sanctions in China. Journal of Business Research, 68(6), 1186–1195. https://doi.org/10.1016/j.jbusres.2014.11.013

Masli, A., Peters, G., Richardson, V., & Sanchez, J. (2010). Examining the potential benefits of internal control monitoring technology. The Accounting Review, 85(3), 1001–1034. https://doi.org/10.2308/accr.2010.85.3.1001

McCallen, J., Schmardebeck, R., Shipman, J.E., & Whited, R.L. (2022). Evidence on the 2020 exemption of low-revenue issuers from the internal control audit requirement. Working Paper.

Nagy, A. (2010). Section 404 compliance and financial reporting quality. Accounting Horizons, 24(3), 441–454. https://doi.org/10.2308/acch.2010.24.3.441

Nam, S., & Ronen, J. (2012). The impact of nonaudit services on capital markets. Journal of Accounting, Auditing, and Finance, 27(1), 32–60. https://doi.org/10.1177/0148558X11409143

Public Company Accounting Oversight Board (PCAOB). (2007, November 15). Auditing standards (PCAOB release No. 2007-005A). https://pcaobus.org/Standards/Auditing/pages/auditing_standard_5.aspx

Robinson, D. (2008). Auditor Independence and auditor-provided tax service: Evidence from going-concern audit opinions prior to bankruptcy filings. Auditing: A Journal of Practice & Theory, 27(2), 31–54. https://doi.org/10.2308/aud.2008.27.2.31

Sharma, D.S., Tanyi, P.N., & Litt, B.A. (2017). Costs of mandatory periodic audit partner rotation: Evidence from audit fees and audit timeliness. Auditing: A Journal of Practice & Theory, 36(1), 129–149. https://doi.org/10.2308/ajpt-51515

Shipman, J., Swanquist, Q., & Whited, R. (2017). Propensity score matching in accounting research. The Accounting Review, 92(1), 213–244. https://doi.org/10.2308/acr-51449

Simunic, D. (1984). Auditing, consulting, and auditor independence. Journal of Accounting Research, 22(2), 679–702. https://doi.org/10.2307/2490671

Zhang, J., & Han, J. (2016). Adoption of Sarbanes-Oxley act in China: Antecedents and consequences of separate auditing. International Journal of Auditing, 20(2), 108–118. https://doi.org/10.1111/ijau.12057
## Appendix A: Variable Definitions

| Variable | Definition |
|----------|------------|
| Integrate | 1 if ICFR and FS audits are integrated, and 0 otherwise. |
| ENOI | absolute value of industry median adjusted before-tax non-operating income divided by equity. |
| AudLag | the natural log of the number of calendar days from fiscal year end to the date when the integrated auditor (FS auditor in separate auditing) files the auditor’s report. |
| Mandatory | 1 if the company is mandated to disclose its audited ICFR report, and 0 otherwise. |
| Size | natural logarithm of total assets measured in RMB. |
| ARINV | sum of accounts receivable and inventory divided by total assets. |
| Lev | total liabilities divided by total assets. |
| Loss | 1 if the company reports a net loss, and 0 otherwise. |
| ROA | operating earnings before tax divided by average total assets. |
| OCF | operating cash flows divided by total assets. |
| BTM | book to market ratio, defined as book value of total assets scaled by market value of equity at the end of fiscal year. |
| Growth | change in sales divided by sales. |
| SOE | 1 if the company is a stated owned enterprise, and 0 otherwise. |
| Complexity | a score of the company’s complexity, following Gul et al., 2017. |
| Bigauditor | 1 if the company’s financial statement auditor is an international Big 4 or a Chinese national Big 10 accounting firm, and 0 otherwise. |
| Specialist | 1 if the auditor is an industry specialist, and 0 otherwise. |
| CleanOpn | 1 if the auditor issues unqualified audit opinion, and 0 otherwise. |
| ICIndex | the square root of the internal control index compiled by DIB. |