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# Accounting outsourcing and audit lag

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## Abstract

**Purpose** – This paper examines the relationship between accounting outsourcing and audit lag. Accounting outsourcing may reduce misstatement risk, reducing the amount of audit effort necessary and thereby decrease audit lag. Alternatively, outsourcing may increase the amount of coordination necessary between the auditor, client management and the outside accounting service provider and thereby increase audit lag.

**Design/methodology/approach** – The accounting outsourcing/audit lag relationship is examined among closed-end mutual funds. These funds often outsource their accounting functions and disclose the names and services provided by any company providing services to the fund. These disclosures permit a consistent measurement of whether the fund outsources their accounting functions or performs them in-house.

**Findings** – This paper finds a positive relationship between accounting outsourcing and audit lag; outsourcing funds have audit lags that are two to three days longer than those not outsourcing their accounting. The results are robust to different specifications, controls for the distinctive characteristics of closed-end funds and consideration of endogeneity.

**Practical implications** – Closed-end funds could consider the increased time necessary to complete the audit when deciding whether to outsource their accounting functions.

**Originality/value** – By identifying a unique setting in which outsourcing data can be consistently obtained and analyzed (i.e. closed-end funds), this is the first study to empirically evaluate the relationship between accounting outsourcing and audit lag.

**Keywords** Outsourcing, Audit lag, Closed-end funds

**Paper type** Research paper

## 1. Introduction

Some companies use outside service organizations to perform their accounting functions (i.e. outsource their accounting), and this accounting outsourcing may influence the audit of the company's financial statements. However, there is little research on the relationship between outsourcing and auditing (Bierstaker *et al.*, 2013). Most of the existing research on outsourcing and audits focuses on internal audit outsourcing, including factors that may influence internal audit outsourcing (Abbott *et al.*, 2007; Abdolmohammadi, 2013), and how internal audit outsourcing may affect the audit process, particularly external auditors' reliance on internal auditors (Desai *et al.*, 2011). A more limited stream of research has considered factors that may be associated with companies outsourcing other accounting functions (Everaert *et al.*, 2010; Kamyabi and Devi, 2011, Cullinan and Zheng, 2015).

One aspect of the audit process that could be affected by outsourcing accounting functions is the length of time needed to complete the audit (i.e. audit lag). Various aspects of audit lag have been considered in the literature (Ashton *et al.*, 1987; Soltani, 2002; Payne and Jensen, 2002; Habib and Bhuiyan, 2011; Dao and Pham, 2014). However, the relationship between accounting outsourcing and audit lag has not been explored. There are two possible ways in which accounting outsourcing could influence audit lag. Companies outsourcing

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some aspects of their accounting may have reduced misstatement risk (Prawitt *et al.*, 2012; Höglund and Sundvik, 2015), and could experience a shorter audit lag, as less audit testing is required for lower-risk clients. Alternatively, accounting outsourcing could require more coordination and communication, as the auditor needs information from both the client and the outside service provider (Bierstaker *et al.*, 2013), potentially resulting in a longer audit lag.

To consider whether outsourcing may influence the length of the audit process, we examine the relationship between outsourcing and audit lag among closed-end mutual funds. Closed-end funds frequently outsource their accounting functions to non-affiliated administrators, and a disclosure of these accounting service providers is required. Closed-end funds were thus considered an appropriate setting in which to examine the potential influence of accounting outsourcing on audit lag.

We gathered data from all US closed-end mutual funds in 2011 and 2012. We find that accounting outsourcing by closed-end funds is associated with longer audit lags, with funds outsourcing their accounting functions experiencing audit lags between 1.8 and 3.3 days longer than funds that do not outsource their accounting functions. These results were robust when considering audit opinions that are issued simultaneously for multiple funds in the same fund family, and when controlling for factors that may influence outsourcing decisions through the use of a two-stage model. These results suggest that outsourcing is associated with increased communication and coordination among the auditor, fund management and the outside accounting service provider.

We contribute to the literature in three ways. First, we contribute to the limited literature on how the use of outside service companies may influence the audit process (Bierstaker *et al.*, 2013). We also contribute to the audit lag literature by incorporating some distinctive aspects of the closed-end fund environment in our audit lag models. Finally, we contribute to the literature on the potential costs and benefits of outsourcing by assessing whether outsourcing may influence the timeliness of financial reporting.

## 2. Outsourcing and audit lag

The financial statements of closed-end mutual funds are prepared by the fund's administrator/accounting agent. For some mutual funds, the administrator is affiliated with the fund's investment advisor/portfolio manager (i.e. the accounting functions are performed in-house). For other mutual funds, the administrator is not affiliated with the investment advisor (i.e. the accounting functions are outsourced)[1]. We consider two competing perspectives regarding how the use of an unaffiliated administrator may influence audit lag: the reduced risk perspective and the increased coordination/communication perspective.

### 2.1 *The reduced risk perspective*

The "reduced risk" perspective suggests that outsourcing of accounting functions could decrease the risk of misstatement because the outside administrators may not be subject to the same biases as fund management and may have better controls than the fund's investment advisor (i.e. management). Bierstaker *et al.* (2013, p. 215) note the potential for risk reductions from outsourcing: "certain processes, such as those subject to management bias, may be less inherently risky when outsourced rather than performed in-house". Consistent with this notion, Höglund and Sundvik (2015 and 2016) find that companies' reporting quality (in the corporate tax and financial reporting areas) is higher when the company outsources accounting and reporting functions. Brown-Liburud *et al.* (2014) find that when a third-party specialist is employed to value fair-valued assets, external auditors lower the inherent risk.

PCAOB Standards AU 324.05 to 324.17[2] provide guidance to auditors on issues to consider when the client uses an outside service organization. One of the main issues an auditor considers in deciding whether (and how much) to rely on the outside service provider is the strength of the provider's control process. Duganier (2005) asserts that outside service organizations may have better control processes than if the accounting were performed in-house. Similarly, Mazza *et al.* (2014) suggest that internal controls may be stronger when information technology functions are outsourced. Outside fund administrators providing accounting services to closed-end funds are typically banks with many different clients in the financial service business and which face regulatory sanctions if their controls are inadequate. Therefore, these outside administrators tend to have strong internal controls[3], supporting the notion that outside accounting service providers may reduce the risk of misstatement.

The Securities and Exchange Commission (SEC) periodically issues enforcement actions against mutual funds when these funds mis-value their assets (and thereby misstate their financial statements). We examined all of the SEC enforcement actions for mis-valued mutual fund assets since the 1940s, which are referenced in SEC (2013). Of the 34 cases[4], only one had an outside accounting service provider, and in that instance, the valuation provided by the outside service provider was overridden by the client. These SEC enforcement actions are consistent with a lower likelihood of misstatement when accounting is outsourced[5].

A recent SEC enforcement action against Morgan Asset Management (SEC, 2011) further supports the idea that fund financial statements may be more likely to be misstated when the accounting is performed in-house. Morgan Asset Management was an investment advisor to various mutual funds, and Morgan Keegan (an affiliate of Morgan Asset Management) performed the accounting functions in-house. The portfolio manager for the funds managed by Morgan overstated the value of some of the funds' assets. If the funds had used a non-affiliated administrator, the outside accounting service provider may have inhibited these asset valuation misstatements[6].

### *2.2 Increased coordination/communication perspective*

Accounting outsourcing could increase the amount of coordination needed among the auditor, client management and the outside accounting service provider (which we will refer to as the "increased coordination" perspective). Bierstaker *et al.* (2013, p. 215) note that outsourcing "[...] can increase the complexity of the process and make coordination and communication more challenging relative to when all processes are performed internally". This increased coordination and communication can slow down the audit and increase audit lag. The time necessary to complete the post-year-end substantive testing can be especially affected if the auditor must coordinate evidence-gathering procedures involving both the fund management and the outsourced service provider. If the fund performs the accounting in-house, the auditor is dealing primarily with one organization (i.e. the investment advisor/affiliated administrator). If the fund outsources its accounting, the auditor must coordinate with both client management and the outside accounting service provider.

The outside administrator may also be in a different city from the investment advisor/fund manager. This potential geographic dispersion could further increase the coordination necessary not only between the auditor, fund management and the unaffiliated administrator, but also among members of the audit engagement team which could include auditors from multiple office of the CPA firm[7].

### 2.3 Research question

The reduced risk perspective suggests that accounting outsourcing may reduce the risk of misstatement, permitting the auditor to perform less testing and potentially reducing audit lag. In contrast, the increased coordination perspective implies that accounting outsourcing may increase the coordination and communication needed to complete the audit, slowing down the audit and thereby increasing audit lag. Which of these two effects (if either) exists and exerts a bigger influence on audit lag cannot be predicted from the competing ideas, and is thus an empirical question. This is the main question of our study, and is stated as follows:

*RQ.* Is there a relationship between accounting outsourcing and audit lag?

## 3. Research methods

### 3.1 Identification of closed-end funds and data gathering

We obtained data on the closed-end mutual funds in the Morningstar Direct database for 2011 and 2012. Morningstar Direct contained 626 funds for 2011. We were unable to obtain all the necessary data for 16 of these funds, leaving us with 610 funds from 2011. The Morningstar Direct database contained 636 funds for 2012. Because data limitations, the number of funds from 2012 was reduced by 8 to 628 funds[8]. Our analyses thus include a total of 1,238 fund-years. There were 644 unique funds included in our analyses, 594 funds were included from both years, while 16 funds were only included from 2011 and 34 funds were only included from 2012. We manually collected data on whether the funds outsourced their accounting functions (i.e. used an unaffiliated administrator for their accounting functions) and most of the control variables, from the fund's annual report. Note that we did not use any sampling process; the funds used in our analyses represent the population of closed-end funds for which the necessary data were available.

### 3.2 Variable measures

*3.2.1 Audit lag.* Consistent with other audit lag literature (Abbott *et al.*, 2012; Munsif *et al.*, 2012; Habib and Bhuiyan, 2011), we measure audit lag as the difference (in days) between the fund's fiscal year-end and the date of the audit report[9]. This variable (*Audit lag*) is the dependent variable in our study. The measurements and sources of the *audit lag* variable (and all of the other variables included in our analyses) are presented in Table I.

*3.2.2 Outsourcing.* We measure whether the fund outsourced their accounting based on our review of the fund's annual report[10] to determine the name and affiliation of the entity that provides administration services and/or accounting services to the fund[11]. We also determine whether the entity performing the accounting functions was affiliated with the investment advisor. We then code a variable (*Outsourcing*) which takes the value of 1 if the fund's accounting is outsourced (i.e. performed by a non-affiliated administrator), and takes the value of 0 if the fund's accounting is performed in-house (i.e. performed by an administrator affiliated with the fund's investment advisor/fund manager). This *outsourcing* variable is the main independent variable of interest in our study.

*3.2.3 Control variables.* A sizable body of archival research has examined the determinants of audit lag and has found that both client and auditor characteristics can influence audit lag (Ashton *et al.*, 1987; Bamber *et al.*, 1993, Knechel and Payne, 2001; Habib and Bhuiyan, 2011; Knechel and Sharma, 2012). Drawing upon insights from the audit lag literature, we adapt these client and auditor characteristics to mutual funds. We also consider the characteristics of fund families, of which most closed-end funds are a part. We therefore include the three control variables detailed in the next sections in our audit lag models[12].

**Table I.**  
Variable  
measurements and  
sources

Variable	Variable measurement	Source
<i>Dependent variable</i>		
Audit lag	Length of the time (in days) between the fund's fiscal year-end and the date of the auditor's report	Financial statements and the auditor's report in the fund's annual report
<i>Independent variables</i>		
Outsourcing	Coded 1 if the fund outsources their accounting functions, 0 if the accounting is performed in-house	Disclosures regarding the fund's administrator from the fund's annual report
<i>Control variables</i>		
<u>Fund financial characteristics:</u>		
Log of total assets	Natural log of the fund's total assets	The fund's financial statements in the annual report
% of Level 2-valued assets	Total assets valued using Level 2 valuation inputs divided by total assets	Footnote disclosures in the fund's annual report
% of Level 3-valued assets	Total assets valued using Level 3 valuation inputs divided by total assets	Footnote disclosures in the fund's annual report
% of liabilities	Total fund liabilities divided by total assets	The fund's financial statements in the annual report
Busy season	Coded 1 if the fund's fiscal year-end is November 30, December 31 or January 31	The fund's annual report
<u>Auditor characteristics:</u>		
Deloitte	Coded 1 if the fund's financial statements are audited by Deloitte, 0 otherwise	The auditor's report in the fund's annual report
Ernst & Young	Coded 1 if the fund's financial statements are audited by Ernst & Young, 0 otherwise	The auditor's report in the fund's annual report
KPMG	Coded 1 if the fund's financial statements are audited by KPMG, 0 otherwise	The auditor's report in the fund's annual report
PricewaterhouseCoopers	Coded 1 if the fund's financial statements are audited by PricewaterhouseCoopers, 0 otherwise	The auditor's report in the fund's annual report
<u>Fund family characteristics:</u>		
Fund family size	Count of the number of funds in the fund family	Categorization of funds as being in a fund family based on the "Firm Name" variable in the Morningstar Direct database, supplemented with hand coding for missing observations
Number of funds in the family with the same fiscal year-end and auditor	Count of the number of funds in the fund family with the same fiscal year-end and the same auditor	Fund family as defined above for the fund family variable; fiscal year-end and auditor match based on disclosures in the fund's annual report
<u>Other control variable</u>		
Year dummy	1 if audit was for 2012, 0 if audit was for 2011	Auditor's report in the fund's annual report

3.2.3.1 Fund financial characteristics. We included the size of the fund as a control variable, measured as the natural log of assets (*log of assets*) because of the skewed distribution of assets among closed-end funds. We also measured the percentage of fund's assets which are valued using Level 2 and Level 3 (*percentage of Level 2-valued assets* and *percentage of Level 3-valued assets*). These Level 2 and Level 3 assets are more subjectively valued than Level 1 assets, potentially making these assets more difficult to audit (Ettredge *et al.*, 2014), and thereby increasing audit lag. We also include the fund's liabilities as a percentage of assets (*percentage of liabilities*) to control for the incremental work necessary to audit these liabilities. Finally, we include a variable (*busy season*) to capture whether the fund's fiscal year-end was during the audit busy season (November, December or January). Audits of clients with fiscal year-ends during the busy season may compete for limited auditing firm resources, slowing down the audit, and thereby increasing audit lag.

3.2.3.2 Auditor characteristics. Some research studies suggest that auditor characteristics could influence the audit process, especially in the financial service business (Moroney, 2007). Audit firm factors that may influence audit lag include industry expertise (Habib and Bhuiyan, 2011; Dao and Pham, 2014) and audit structure (Bamber *et al.*, 1993). Industry expertise is typically measured based on the auditor having a minimum number of clients (Reichelt and Wang, 2009). Because the closed-end fund industry is so large, all of the Big 4 auditors audit a large number of closed-end fund clients[13]. We thus have no clear means of measuring industry expertise among CPA firms in the closed-end fund business. To control for any differences that may exist among accounting firms with regard to expertise, structure or other factors, we simply include dummy variables for the Big 4 CPA firms (Deloitte, Ernst & Young, KPMG and PricewaterhouseCoopers)[14].

3.2.3.3 Fund family structure. Most closed-end funds are marketed as (and seen by investors to be) part of a fund family. Most fund families also hire auditors not for an individual fund, but to audit all of the funds in the fund family[15]. We determined whether the fund was part of a fund family based on who the investment advisor was, and we measured how many funds were part of the fund family (*fund family size*). A larger fund family could command more attention from an auditor, resulting in a shorter audit lag for funds in that large family. Alternatively, coordination of the audit work for multiple funds in the fund family could slow down the audit.

We also considered the seasonal workload of the auditor, and how this workload could be affected by the number of funds in the fund family that have the same fiscal year-end and the same auditor. We therefore include a control variable (*funds in the family with the same fiscal year-end and auditor*) measuring the number of funds within a fund family with the same fiscal year-end and the same CPA firm as auditor[16]. If the auditor conducts multiple audits at the same time for the same fund family, this "batching" of audits[17] could slow down the audit and thereby increase audit lag.

### 3.3 Statistical analyses

To examine our *RQ*, we first tested a model of audit lag including all of the control variables, but excluding the outsourcing variable. We then added the outsourcing variable to the audit lag model to assess the significance and incremental explanatory contribution of the outsourcing variable. We use robust standard errors to control for possible heteroskedasticity. To control for possible outliers, all of the continuous variables are winsorized at 1 and 99 per cent. We also ran all of the models in Tables IV and V (untabulated), with clustered standard errors to account for many funds appearing in the analyses twice (once for each year). The results were not materially affected.

## 4. Results

### 4.1 Descriptive statistics and correlation analysis

Descriptive statistics are presented in Table II. The mean audit lag is 53.92 days, with a minimum audit lag of 19 days and a maximum of 86 days. Accounting is outsourced by 35 per cent of the closed-end funds. The mean closed-end fund has assets of \$453,661 (in thousands), the majority of which (68.99 per cent) are valued using Level 2 valuations inputs. Assets valued using Level 1 inputs and Level 3 inputs comprise (a mean of) 26.03 and 2.03 per cent of total assets, respectively. Non-fair-valued assets are (a mean of) 2.80 per cent of assets. For the average fund, liabilities are 17.63 per cent of assets. Funds with fiscal year-ends during the busy season comprise 33 per cent of our observations. The market shares of the Big 4 firms suggest a relatively even spread among the Big 4 firms, except for KPMG, which audits only 9 per cent of the closed-end funds included in our analysis. The mean fund family size is 50.87 funds, with a maximum of 136 funds (the Nuveen fund family). CPA firms audit an average of 10.77 funds from the same fund family at the same time.

The correlations among the variables included in our models are presented in Table III. The correlation between outsourcing and audit lag is positive and significant, suggesting that accounting outsourcing may increase audit lag. Outsourcing is also correlated with a number of the control variables, which supports the use of regression models to measure the potential incremental effects of outsourcing on audit lag.

### 4.2 Regression results

The ordinary least square (OLS) regression results are presented in Table IV. Column A presents the model of audit lag excluding the outsourcing variable. The model is significant overall, with an adjusted  $R^2$  of 17.00 per cent. Most of the variables are in the expected direction and significant [18]. Column B presents the audit lag model including the outsourcing variable. The model overall is significant, and the addition of the outsourcing variable increases the explanatory power of the model, with the adjusted  $R^2$  value increasing from 17.00 per cent (without the *outsourcing* variable) to 22.98 per cent [19] (with the *outsourcing* variable). This incremental change in adjusted  $R^2$  is significant with  $p$ -value < 0.0001. Consistent with the significant increase in the explanatory power of the model, the *outsourcing* variable is highly significant ( $t = 9.13$ ,  $p < 0.0001$ ). The coefficient on the

Variable	Mean	SD	Minimum	Maximum
Audit lag	53.92	5.38	19	86
Outsourcing	0.35	0.48	0	1
Total assets (in thousands)	\$453,661	\$471,178	\$22,289	\$2,575,140
% of Level 1-valued assets	26.03%	38.24%	0.00	99.98%
% of Level 2-valued assets	68.99%	38.56%	0.00	98.99%
% of Level 3-valued assets	2.03%	8.16%	0.00	60.00%
% of liabilities	17.63%	14.56%	0.00	46.48%
Busy Season	0.33	0.47	0	1
Deloitte	0.28	0.45	0	1
Ernst & Young	0.33	0.47	0	1
KPMG	0.09	0.28	0	1
PricewaterhouseCoopers	0.25	0.43	0	1
Fund family size	50.87	52.02	1	136
Number of funds in the family with the same fiscal year-end and auditor	10.77	9.91	1	31

**Table II.**

Descriptive statistics

**Note:** Number of observations = 1,238

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Audit lag (1)	1.00000												
Outsourcing (2)	0.14763	1.00000											
Total assets (in thousands) (3)	<0.0001	0.07052	1.00000										
% of Level 1-valued assets (4)	0.2241	0.0131	0.11456	1.00000									
% of Level 2-valued assets (5)	0.6907	0.0030	<0.0001	<0.0001	1.00000								
% of Level 3-valued assets (6)	0.5831	<0.0001	0.0013	<0.0001	0.17525	1.00000							
% of liabilities (7)	0.11087	0.09537	0.08547	-0.05964	-0.17525	0.05215	1.00000						
Busy Season (8)	0.18581	0.10006	0.16371	-0.26532	0.23595	0.5215	1.00000						
Deloitte (9)	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	0.0666	0.0187	<0.0001					
Ernst & Young (10)	-0.01812	-0.00367	0.02033	0.46260	-0.46727	0.03202	-0.20975	1.00000					
KPMG (11)	0.5241	0.8975	0.4748	<0.0001	<0.0001	0.2602	<0.0001	0.0167	<0.0001	1.00000			
PricewaterhouseCoopers (12)	-0.09708	0.46600	0.06693	-0.05323	0.06472	-0.03428	0.06684	-0.12955	0.0017	0.0001	1.00000		
Fund family size (13)	0.14578	-0.34801	0.0185	0.0612	0.0228	0.2281	0.0187	<0.0001	0.0017	<0.0001	<0.0001	1.00000	
Number of funds in the family with the same fiscal year-end and auditor (14)	<0.0001	<0.0001	0.0261	<0.0001	<0.0001	0.0167	<0.0001	0.0017	0.0017	0.0001	0.0001	<0.0001	1.00000
	-0.07619	-0.14155	0.02230	-0.01425	-0.00107	0.03778	-0.07576	0.06491	-0.19293	-0.22135	1.00000		
	0.0073	<0.0001	0.4331	0.6163	0.9701	0.1841	0.0077	0.0224	<0.0001	<0.0001	<0.0001	1.00000	
	0.00500	-0.04191	0.05215	0.16620	-0.14200	-0.04500	-0.21729	0.14506	-0.35554	-0.40792	-0.17971	1.00000	
	0.8606	0.1405	0.0666	<0.0001	<0.0001	0.1135	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	1.00000
	0.30517	-0.10350	-0.04595	-0.33169	0.36732	-0.15068	0.34288	-0.33228	0.10154	0.36709	-0.25929	1.00000	
	<0.0001	0.0003	0.1061	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	1.00000
	0.25489	-0.03929	-0.04229	-0.36768	0.40428	-0.13816	0.30120	-0.40148	0.14941	0.11513	-0.21442	0.03174	0.65564
	<0.0001	0.1671	0.1370	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.2644	<0.0001

Note: Number of observations = 1,238

Table III.  
Correlation matrix

**Table IV.**  
Multivariate analysis  
results *Dependent*  
*variable: Audit lag*

Variable	Column A: without outsourcing		Column B: outsourcing added	
	Coeff. est.	<i>t</i> -statistic	Coeff. est.	<i>t</i> -statistic
Intercept	52.91998	30.98	52.34956	31.05
Outsourcing			3.29472	9.13
Log of total assets	-0.07625	-0.58	-0.15238	-1.21
% of Level 2-valued assets	-1.95101	-3.71	-1.65506	-3.10
% of Level 3-valued assets	9.36644	6.22	8.31551	5.88
% of liabilities	3.79957	3.13	2.13175	1.81
Busy season	0.82206	1.79	0.88820	1.94
Deloitte	-1.06215	-1.30	-2.04995	-2.42
Ernst & Young	0.41697	0.53	1.35964	1.63
KPMG	0.35630	0.37	1.38478	1.40
PricewaterhouseCoopers	0.85942	1.14	1.17787	1.48
Fund family size	0.02882	6.99	0.03107	7.41
Number of funds in the family with the same fiscal year-end and auditor	0.08683	4.67	0.09606	5.44
Year dummy	-0.63237	-2.25	-0.58398	-2.16
Number of observations	1,238		1,238	
Adjusted $R^2$	17.00%		22.98%	
<i>F</i> -statistic	22.12		29.38	
Probability > <i>F</i> -statistic	<0.0001		<0.0001	
				Pr > <i>t</i>
				<0.0001
				<0.0001
				0.2251
				0.0020
				<0.0001
				0.0700
				0.0530
				0.0157
				0.1035
				0.1629
				0.1390
				<0.0001
				<0.0001
				0.0310

outsourcing variable is 3.29, indicating that funds outsourcing their accounting functions have audit lags that are (on average) 3.29 days longer than funds performing their accounting in-house[20].

The positive coefficient of 3.29 on the *outsourcing* variable (suggesting that audits of closed-end funds that outsource their accounting take 3.29 days longer than audits of funds performing the accounting in-house) is consistent with the “increased coordination” perspective. This “increased coordination” perspective suggests that accounting outsourcing could increase audit lag, as more time is necessary to gather evidence from both the client (i.e. the fund’s investment advisor) and the entity to which the accounting has been outsourced (i.e. the outside administrator). These results do not support the “reduced risk” perspective which posits a negative relationship between outsourcing and audit lag.

The results for the control variables are mixed. With regard to fund financial characteristics, the *log of total assets* is not significantly related to audit lag, but the *percentage of Level 3-valued assets*[21], the *percentage of liabilities* and *busy season* are all positively related to audit lag. Contrary to our expectation, the *percentage of Level 2-valued assets* is negatively related to audit lag[22]. The CPA firm indicator variables suggest that closed-end fund audits performed by Deloitte are shorter than those of other CPA firms[23]. Regarding the fund family variables, both *fund family size* and *funds in the family with the same fiscal year-end and auditor* are positively related to audit lag[24]. These results suggest that auditors take longer to audit funds from larger families and to audit a large “batch” of funds from the same family at the same time.

#### 4.3 Supplemental analysis

The results presented in Table IV indicate that audit lag increases when closed-end funds outsource their accounting functions. These results support the “increased coordination” perspective on the relationship between outsourcing and audit lag. To further analyze the potential influence of increased coordination time on audit lag when funds outsource, we added a variable to our audit lag model to account for the possible interaction between the *outsourcing* variable and the *funds in the family with the same fiscal year-end and auditor* variable. If CPA firms audit a large batch of funds from the same family simultaneously, the coordination necessary when a fund outsources its accounting functions could be greater than when the CPA firm is auditing a single fund (or smaller batch of funds) that outsources accounting. This incremental coordination when multiple funds outsourcing accounting are audited simultaneously could result in a longer audit lag than when a single fund with accounting outsourcing is audited. Consistent with this idea, our results (presented in Column A of Table V) show a significant, positive relationship on the *outsourcing \* funds in the family with the same fiscal year-end and auditor* interaction variable in the audit lag model.

Research has noted the geographic concentration of the mutual fund business in Northeastern USA, especially in Boston (Graves, 1998; Lounsbury, 2007). We also included a geographic variable (*Boston Office*) to measure whether the audit opinion was signed in the Boston office of the CPA firm. More closed-end fund audit opinions (36 per cent) are signed in Boston than anywhere else[25]. Boston is also where the State Street Bank (the most commonly-chosen accounting outsource service provider) is located. Audits conducted in Boston may be done more quickly because of the large number of experienced personnel in the Boston office (due to the large number of clients in the region), and because the most common accounting outsourcing service provider is based in Boston, reducing the potential geography coordination necessary. Our results presented in Column B of Table V are in accordance with this notion. The *Boston Office* variables have a significant negative



coefficient[26], and these results suggest that closed-end fund audits conducted in the Boston offices of accounting firms may be completed more quickly than audits done in other offices[27].

Note that in both models presented in Table V that the *outsourcing* variable remains significant and positively related to audit lag. The *outsourcing* coefficient in the model with all of the control variables (i.e. Column B of Table V), however, is reduced to 1.84 days. This coefficient reduction suggests that some of the effects of outsourcing on audit lag presented in Table III are related to the number of funds in the batches of funds from the same fund families audited simultaneously and/or are related to a regional effect based in Boston.

#### 4.4 Robustness testing

**4.4.1 Common report dates and combined reports.** The results presented in the analyses above are based on measuring all of the variables for individual funds. However, many funds are part of fund families and are audited at the same time as other funds in the family, and often have the same audit opinion date. We therefore developed variables at the level of batch of funds, with batches being defined based on the funds being in the same fund family, having the same fiscal year-end and being audited by the same accounting firm. For the independent variables in these models, we used the means[28] of the variables among the funds in the batch. There were 370 unique batches of funds based on these criteria. Results of testing our model of audit lag based on these observations are presented in Column A of Table VI. The results of this analysis are consistent with the earlier analyses on an individual fund basis: outsourcing is associated with longer audit lags, with the coefficient of outsourcing being 1.55 days (slightly smaller than when measured on an individual fund basis).

We also noted during our data gathering that the financial statements of some funds are presented in the same annual report as other funds within the same fund family, and have combined auditor's reports. We also developed measures based on the means of the variables at the level of the auditor's report (rather than the individual fund level). There are 812 unique annual reports for the 1,238 fund-years in our analyses. The results of testing the audit lag model with the variables defined at the report level (with the *number of funds in the audit report* substituted for the *funds in the family with the same fiscal year-end and auditor*) are presented in Column B of Table VI. This analysis shows that the main outsourcing result still holds: outsourcing is associated with increased audit lags of about 1.80 days.

These two robustness analyses indicate that our results are robust with regard to alternative specifications of the observations in our analyses: funds outsourcing their accounting tend to have longer audit lags. The higher explanatory power of the models (i.e.  $R^2$ ) based on individual funds (presented in Tables IV and V) suggests that our use of the individual fund-level analyses is appropriate.

**4.4.2 Two-stage model to control for possible endogeneity.** Factors that may affect the choice of a closed-end fund to outsource may also influence the audit lag of the funds. To control for this possible bias, we implemented a Heckman two-stage model. In the first stage, we developed a model of factors that may be associated with a fund's choice to outsource their accounting functions. Models of mutual fund outsourcing have been developed by Chen *et al.* (2013) for outsourcing investment advisory services, Cummings *et al.* (2015) for outsourcing administration (including accounting) and Cullinan and Zheng (2015) for *fund families* outsourcing accounting processes. We base our first-stage model on Cullinan and Zheng (2015), which we adapted to the *individual fund*-level analysis used in our study.

The first-stage model is as follows: Outsourcing = f(fund age, dollar value of market-valued securities, dollar value of good-faith estimated securities [i.e. Levels 2 and 3],



fund family size). Because of missing data on fund age, our number of observations was reduced to 1,150. In the first-stage model (untabulated), age was significant at  $<0.0001$  and fund family size was significant at 0.01. Based on the results of this model, we computed inverse Mills ratios, which were then included in the second-stage model of audit lag, presented in Table VII. The coefficient on the outsourcing variable in the lag model in Table VII is 3.57, indicating that our earlier finding of longer audit lags when funds outsource their accounting functions is robust.

#### 4.5 Limitations

This study is subject to a number of limitations. First, closed-end funds that outsource accounting outsource the entire accounting process. Other types of clients that outsource only certain parts of the accounting process (e.g. cash disbursements or payroll) may not have a similar influence on audit lag. Second, there are some distinctive aspects of the mutual fund environment, such as the funds often being part of a fund family, which may limit the generalizability of our results. Third, the results of this study do not provide direct evidence regarding the mechanism by which outsourcing could impact the audit lag. The increased audit lag associated with outsourcing found in this study could be due to: the increased coordination effect alone or the increased coordination effect and the reduced risk effect may both exist and the former outweighs the latter in its influence on audit lag. Future research could consider the potential influence of partial outsourcing on audit lag or the potential influence of outsourcing on audit lag among other types of companies.

### 5. Summary

Research on the effects of accounting outsourcing on the audit process is rather limited (Bierstaker *et al.*, 2013). One possible factor that accounting outsourcing may influence is audit lag, which affects the timeliness of financial reporting. We examine the relationship between accounting outsourcing and audit lag among closed-end mutual funds, which often outsource their accounting processes and disclose whether they have an affiliated

Variable	Coeff. est.	<i>t</i> -statistic	Pr > <i>t</i>
Intercept	51.4883	33.98	<0.0001
Outsourcing	3.5669	9.15	<0.0001
Log of total assets	0.0000	0.17	0.8689
% of Level 2-valued assets	-0.9778	-1.85	0.0644
% of Level 3-valued assets	7.9648	5.52	<0.0001
% of liabilities	2.2276	1.83	0.0681
Busy season	0.4839	0.97	0.3316
Deloitte	-2.5606	-3.20	0.0014
Ernst & Young	0.4953	0.59	0.5528
KPMG	0.0095	0.01	0.9932
PricewaterhouseCoopers	0.6795	0.89	0.3751
Fund family size	0.0363	9.40	<0.0001
Number of funds in the family with the same fiscal year-end and auditor	0.0373	3.46	0.0006
Year dummy	-0.1598	-0.61	0.5452
Inverse mills ratio	-2.4037	-0.83	0.4091
Number of observations	1,150		
Adjusted $R^2$	24.13%		
<i>F</i> -statistic	27.11		
Probability > <i>F</i> -statistic	<0.0001		

**Table VII.**  
Second stage of two-stage Heckman model  
*Dependent Variable:*  
audit lag

administrator (in-house) or unaffiliated administrator (outsource) performing their accounting functions.

We propose two possibilities for the relationship between outsourcing and audit lag:

- (1) accounting outsourcing could be negatively associated with audit lag because of the reduced risk associated with the preparation of the financial statements by a more objective outside accountant (the reduced risk notion); or
- (2) accounting outsourcing could be positively associated with audit lag as a result of the increased coordination needed for an auditor to obtain information from both management and the outsource service provider (the increased coordination notion).

We examine the audit lags of 1,238 closed-end fund financial statements for 2011 and 2012 and find a positive relationship between accounting outsourcing and audit lag. This finding is robust to the inclusion of a wide variety of control variables, and to alternative definitions of the individual observations. Overall, our findings support the idea that outsourcing may increase the time necessary to complete the audit, as the auditor needs to coordinate information coming from the client and from the outside accounting service provider.

These results are of potential interest to auditors in planning the time and staff necessary to conduct audits of clients engaged in accounting outsourcing. Auditors could consider the incremental time necessary to audit funds outsourcing their accounting functions when budgeting and planning other audits which may use the same audit team members. Fund directors and trustees may also find these results to be useful in making decisions regarding whether to outsource their accounting functions, which may delay the release of the funds' financial statements.

#### Notes

1. In all cases, the administrator is separate *from the fund*, but may or may not be separate *from fund management* (i.e. the investment advisor). Therefore, in our study, the use of an affiliated administrator is equivalent to management performing the accounting functions in-house, while use of a non-affiliated administrator indicates that the accounting functions are outsourced.
2. The PCAOB has subsequently renumbered its standards. As of January 1, 2016, the relevant standards are unchanged, but are referenced as AS 2601.05 to 2601.17.
3. The five companies to which the closed-end funds in our analyses have outsourced their accounting are: State Street Bank, Bank of New York, Brown Brothers Harriman, ALPS Fund Services and US Bank. We reviewed the service organization internal control reports (SAS 70/SSAE 16 reports) for each of the five companies for the relevant periods and all received unqualified opinions.
4. There were links to 53 separate enforcement actions in [SEC \(2013\)](#). However, many of the individual instances of financial misreporting resulted in more than one enforcement action.
5. The results should be interpreted with caution; however, as we cannot measure the prevalence of accounting outsourcing by funds over this period.
6. While gathering data for the closed-end funds in our sample, we noted that the funds managed by Morgan no longer do their accounting in-house, but have chosen (after the events described in the SEC's enforcement action) to outsource their accounting to a non-affiliated administrator.
7. One of the co-authors of this study, when working in the Boston office of a Big N CPA firm, performed audit testing at a Boston-based fund administrator for a New York-based mutual fund client. This testing was done in coordination with audit staff from the New York office. Recent conversations between the author and Boston-based mutual fund auditors indicate that the use of auditors located near a fund's outside administrator (even when the fund is based elsewhere) is still a common practice.

8. The principal data limitation for both years was a lack of annual reports for some funds, especially for those funds that were newly formed, or funds for which we could not clearly determine whether the accounting was performed in-house or outsourced.
9. We also ran all of our models with the log of audit lag as the dependent variable. The results were consistent with the results presented in this paper. Because the explanatory power of the models ( $R^2$ ) with the raw audit lag (i.e. in days) was higher than that for the models using the log transformation of audit lag, we present the models with the untransformed audit lag variable.
10. In a limited number of cases, we had to examine documents outside of the annual report (such as the NSAR-B, which provides information on some of the fund's service providers) to properly determine whether the accounting functions were performed in-house or outsourced. For a very limited group of funds, we were unable to clearly determine whether the accounting functions were performed in house or were outsourced. These funds were not included in our analyses.
11. Most of the funds had a simple administrative structure with one administrator. However, we had to read the disclosures and footnotes carefully as some funds had complicated administrative structures. As examples, some funds use more than one administrator, or the administrator uses a sub-administrator, or the fund has an affiliated administrator and a separate "accounting agent".
12. In addition to the control variables discussed below, we also included (in untabulated analyses) other control variables, including the percentage of fund's assets held in cash, the percentage of the fund's assets held in foreign securities, portfolio turnover, the number of different securities held by the fund, the fund's Morningstar risk rating, the fund's overall Morningstar performance rating and annual performance of the fund. Inclusion of these variables did not materially alter the results presented. However, due to missing data on these variables for many funds, inclusion of these variables resulted in a material loss of observations. To ensure that our models are as representative as possible, we present the more parsimonious model excluding these other control variables.
13. The largest non-Big 4 auditor in the closed-end fund audit market is Tait, Weller & Baker in Philadelphia, which audits 3.9 per cent (49 of the 1,238 fund-years) of the funds in our analysis.
14. In untabulated analyses, we included measures of the market share of the CPA firms rather than the firm dummy variables. The results of the non-CPA-firm-related variables were not materially different in these models. The predictive ability of the models with the market-share-based measure was lower than that of those with the accounting firm dummy variables, suggesting that the dummy variables provide better control for accounting firm characteristics.
15. Some very large fund families split the funds within the fund family between two different CPA firms. For example, the Nuveen Family has 136 closed-end funds (in 2012). Some Nuveen funds are audited by Ernst & Young, while others are audited by PricewaterhouseCoopers. We found no instances in which a fund family used more than two different auditing firms.
16. Some fund families spread out the fiscal year-ends of their funds. For example, Nuveen has 136 funds, 27 of these Nuveen funds have a February 28 (or 29th in 2012) fiscal year-ends, 8 Nuveen funds have fiscal year-ends on March 31, 10 Nuveen funds have fiscal year-ends on April 30th, etc.
17. For the Aberdeen fund family, different funds within the same fund family are audited from different cities (the audit opinions of some Aberdeen funds are signed in Philadelphia, while the audit opinions of other Aberdeen funds are signed in Boston). For our measure of the "batch" size, the Aberdeen funds audited in different cities were not considered to be in the same batch of closed-end fund audits.
18. All of the variance inflation factors in all of our models were below 10, which is below the cutoff for significant multicollinearity concerns identified by [Mendenhall and Sincich \(1986\)](#).
19. This  $R^2$  value is similar to other recent audit lag research ([Habib and Bhuiyan, 2011](#), Table 3, find adjusted  $R^2$  values in the mid-20 per cent range).
20. In untabulated analyses, we separate the outsourcing variable into two variables representing outsourcing to State Street Bank (the largest provider of outsourcing services) and outsourcing to non-State-Street service providers. Both of these variables were significantly positive, with

coefficients of 3.6 (outsourcing to State Street) and 2.7 (outsourcing to non-State-Street service providers). The difference in these coefficients is marginally significant ( $F = 3.10$ ;  $p$ -value = 0.078).

21. The percentage of assets valued using Level 1 inputs is not included in our model because the percentages of assets valued using Levels 1, 2 and 3 inputs would then be a linear combination, violating OLS regression assumptions. The percentage of Level 1 assets is therefore the base category, and the coefficients on *the percentage of Level 2(3)-valued assets* represent the incremental effects of these assets relative to Level 1-valued assets.
22. We might speculate that because Level 2 assets are the most common type of assets among closed-end funds (68.99 per cent of assets are Level 2-valued assets), these types of assets may be a higher priority for auditors.
23. In untabulated analyses, we also included a variable for whether the fund changed auditors. This variable was not significant, and did not materially affect any of the other results. There were very few funds changing auditor (e.g. 2 auditor changes in 2012).
24. While the *funds in the family with the same fiscal year-end and auditor* and *fund family size* variables are correlated ( $r = 0.665$ ), the incremental effect of *funds in the family with the same fiscal year-end and auditor* variable over the *fund family size* variable indicates that both variables are potentially important factors related to audit lag. Also, the variance inflation factors for the variables are 2.24 (for *fund family size*) and 2.13 (for *funds in the family with the same fiscal year-end and auditor*), indicating that inclusion of both variables does not cause collinearity concerns.
25. The next most common opinion city was New York, with only 15 per cent of audit opinions signed there. In untabulated analyses, this variable was marginally significant ( $p = 0.071$ ) and negatively related to audit lag.
26. In untabulated analyses, we included a variable measuring the share of audit opinions signed in each city that were issued for the funds in our analysis. Results for this variable were not significant, suggesting that the distinctive confluence of the large number of fund audits conducted in Boston and the presence of large fund service providers in this geographic area may be the main driver of this result.
27. These results should be interpreted with caution, as the variable only measures whether the audit opinion was signed in Boston. We are not able to measure whether the Boston office may have been involved in audits of funds for which the administrator and/or custodian was in the Boston area, but which were signed in another area where the fund/investment advisor and audit engagement partner were located.
28. For both of the analysis presented in Table VI, we also measured the variables based on the maximum value for any fund within the batch of funds (as in Column A) or the fund report (as in column B). Results were materially consistent with those presented in Table VI.

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