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Earnings management under different ownership and corporate governance structure: A natural experiment with master limited partnerships

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ABSTRACT

Master limited partnership (MLP) is a publicly traded partnership run by a general partner (GP) with sole managerial decision-making power, whereas limited partners (LPs) have no role in the operation. As an alternative ownership structure to the traditional corporate ownership, MLPs by law must pay out available cash flow to GPs and LPs. GPs are compensated not by standard stock options but by the distributed cash flow. We find that the MLPs engage in more real activities management than their matching corporations do, but no difference in discretionary accruals management. Since firm characteristic variables do not have a much moderating effect, the difference in governance structures is not the key driver for the behavioral difference, which we attribute to a more quick response by GPs to changes in market conditions. MLPs have higher pressure to generate a consistent stream of earnings and to smooth cash distributions to their unitholders.

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1. Introduction

American corporations grow rapidly during the “Gilded Age” after the Civil War and start to dominate the domestic economy initially and the world economy after the WWII. Alfred Chandler (1984) coins the term “American managerial capitalism” (AMC) to distinguish the American economy from those with large family-controlled firms in the UK and Germany. In the heart of AMC are professional managers, who must first stand out in a large pool of talented candidates and then go through rigorous training in business programs at the top universities. Unfortunately, a series of financial scandals by corporate executives, which have resulted in some infamous bankruptcies by several well-known larger American corporation since the 1980s, have tarnished the allure of AMC.

There are at least two culprits for the declining of the AMC. First, there is the inherent principal-agent conflict. Jensen (1986) hypothesizes that the management (the agent) has the incentive to hoard free cash flow (FCF), rather than paying out to shareholders (the principal), and grow the firm beyond the optimal size at

the expense of the shareholders. A solution to the principal-agent problem is to distribute FCF to the shareholders and bondholders, i.e., reducing the number of extra resources available to the management. For traditional corporations, there is no law mandating the management to pay out FCF. Secondly, it is widely suspected that the abuse in rewarding huge stock options to the management by corporate boards since the 1980s incentivize misbehavior such as earnings manipulation. The value of these stock options depends on share prices, which depends on earnings. As a result, corporate executives have the incentive to manipulate earnings to boost share prices.

Although the corporation is the dominant business form, there is an alternative organizational form in the United States, i.e., Master Limited Partnerships (MLPs). MLPs are publicly traded limited partnerships. An MLP has one general partner (GP) and many limited partners (LPs). The GP has unlimited liability as well as sole decision-making power. In contrast, LPs have limited liability and no role in decision-making. By law, MLPs have to pay out at least 90% of the free cash flow (FCF) to all partners. Also, a GP receives her compensation not from any options but only from the distributed FCF. These two features make MLPs quite special and different from the traditional corporations. Many large MLPs are competing against well-known corporations in the energy and real estate sectors. Mandell (2015) shows a new wave formation of MLPs after

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2004 as a result of a modification in Delaware alternative entity law permitting the full waiver of fiduciary duty by partnerships and LLCs. [Atanassov and Mandell \(2018\)](#) show that MLPs with a weak corporate governance structure tend to pay out higher dividends.

In this study, we examine how GPs behave differently from their corporate peers in practicing earnings management (EM). EM refers to the practice by top corporate executives who take actions to steer financial reporting results toward specific targets. There are two types of EM. The first is discretionary accruals management that involves altering the timing and amounts of accruals and deferrals. The second type is real activities manipulation involving purposely-deviating real activities such as production, sales, and administrative operation, and R&D from the normal level to move earnings toward a target level. Discretionary accruals management is easy to implement and thus quite common. [Dechow, Sloan, and Sweeney \(1996\)](#) and [Dechow and Dichev \(2002\)](#) provide a discussion on the rationale for managing discretionary accruals and the earlier evidence. [Graham, Harvey, and Rajgopal \(2005\)](#) present survey results showing that corporate executives admit their propensity to alter real activities. [Roychowdhury \(2006\)](#) and [Mellado-Cid, Jory, and Ngo \(2018\)](#) provide empirical evidence for the effects of real activities management on firm valuation.

Some EM practices can be outright financial frauds, but most are not necessarily so because the management can legally make adjustments to affect earnings under the current regulatory framework and accounting rules. For example, under the US Generally Acceptable Accounting Principles (GAAP), the management has the discretions permissible to conduct discretionary accrual earnings management. Real earnings management is also legal since the management has the decision-making power in adjusting advertising, R&D, and other operations over time.

Because MLPs pay out most of the available cash flow to shareholders, the management has less resource to squander. MLPs have to raise funds at the capital market to finance new projects; there could be more effective monitoring from the investors and analysts. If the GPs of the MLPs behave the same as the management of traditional corporations, the effectiveness in alleviating the agency problem by these two special features, i.e., mandatory distribution of free cash flow and compensation by distributed cash flow, may be questioned. However, if GPs behave differently from the management of traditional corporations, regulators and corporate boards may be interested in looking into whether a mandatory distribution of FCF and a change in the executive compensation practice are warranted – without changing the business organization form. This is the motivation of our study.

The rest of the paper proceeds as follows. Section 2 reviews related literature and formulates the hypotheses. Section 3 discusses the data and the methodology. Section 4 presents empirical results. Section 5 discusses the findings and concludes.

2. Review of related literature and the formation of hypotheses

In this section, we first discuss MLP organization structure and the governance issues. Then, we review related previous studies on the relation between corporate governance and EM. Finally, we develop several testable hypotheses.

2.1. Master limited partnerships organization structure

A GP can be a holding company or a person appointed by a sponsoring company. The sponsoring company divest assets to the MLP and placing new assets or business streams in the MLP. An MLP raises capital by issuing units to investors, who become unitholders, i.e., shareholders. With limited liability, LPs have no role in man-

Table 1
 Sample Distribution.

Year	MLPs		All Non-MLPs	
	N	%	N	%
1995	3	0.47	430	5.71
1996	7	1.09	445	5.91
1997	9	1.4	436	5.79
1998	11	1.71	422	5.6
1999	11	1.71	370	4.91
2000	11	1.71	348	4.62
2001	11	1.71	325	4.31
2002	13	2.02	304	4.04
2003	14	2.17	298	3.96
2004	14	2.17	306	4.06
2005	17	2.64	331	4.39
2006	25	3.88	363	4.82
2007	31	4.81	368	4.88
2008	32	4.96	365	4.84
2009	31	4.81	359	4.77
2010	34	5.27	350	4.65
2011	44	6.82	345	4.58
2012	62	9.61	346	4.59
2013	76	11.78	345	4.58
2014	93	14.42	346	4.59
2015	96	14.88	332	4.41
Total	645	100	7534	100
Number of unique firms	99		930	

Panel B – By Industry

Industry	MLPs		All Non-MLPs	
	N	%	N	%
Bituminous Coal & Lignite Mining	38	5.89	146	1.94
Crude Petroleum & Natural Gas	121	18.76	3049	40.47
Drilling Oil & Gas Wells	2	0.31	468	6.21
Oil & Gas Field Exploration Services	15	2.33	135	1.79
Oil & Gas Field Services, Nec	5	0.78	346	4.59
Mining & Quarrying of Nonmetallic Minerals	9	1.4	229	3.04
Industrial Organic Chemicals	2	0.31	162	2.15
Agricultural Chemicals	24	3.72	93	1.23
Petroleum Refining	32	4.96	624	8.28
Steel Works, Blast Furnaces & Rolling Mills	3	0.47	507	6.73
Trucking & Courier Services (No Air)	7	1.09	137	1.82
Water Transportation	8	1.24	342	4.54
Deep Sea Foreign Transportation Of Freight	16	2.48	482	6.4
Pipe Lines (No Natural Gas)	48	7.44	13	0.17
Natural Gas Transmission	99	15.35	237	3.15
Natural Gas Transmission & Distribution	14	2.17	246	3.27
Wholesale-Petroleum Bulk Stations & Terminals	68	10.54	82	1.09
Wholesale-Petroleum & Petroleum Products	45	6.98	139	1.84
Retail-Miscellaneous Retail	89	13.8	97	1.29

agerial decision-making but hold most of the units issued by the partnership (98% in most cases). These units are traded on regular stock exchanges. Thus, MLPs are public companies and release quarterly and annual reports as well as filing various other reports of material information with the Securities Exchange Commission (SEC). MLPs differ from traditional corporations in two important aspects. First, as pass-through entities, MLPs are not subject to corporate taxation, thus avoiding double taxation (i.e., once at the corporate level and a second time at the individual shareholder level). Secondly, MLPs must distribute most of their income to their unitholders, who must pay taxes on their distributed income for income tax purposes, similar to the case of partners in a partnership.

As [Table 1](#) shows, the number of listed MLPs increased from three in 1995 to ninety-six in 2015. Most MLPs operate in the natural resources sector including oil, gas and petroleum exploration, processing, storage, transportation, pipeline, and related activities. This is the case because IRS rules require that MLPs could maintain their tax-exempt status only if they derive at least 90% of their income from qualifying sources, which include revenues predominantly from natural resources, energy, and commodities. With

recent changes in legislation allowing more institutional investors to own MLP units (for example, mutual funds), and given MLPs' ability to generate high yield on investment for investors due to their tax-free status, we expect interest in MLP units to increase.

2.2. Corporate governance and earnings management

Even if it is not outright frauds, is EM still harmful to investors? The answer depends on the degree of sophistication of the investors, corporate governance structures, and the ability of the management. If the capital market is efficient and there is effective monitoring on the management, conducting discretionary accruals management is less likely to distort market valuation. Some researchers have shown that the management may use discretionary accruals management to smooth earnings fluctuation or to signal to investors about future performance. [Subramanyam \(1996\)](#) and [Bowen, Rajgopal, and Venkatachalam \(2008\)](#) provide evidence to support this so-called efficient contracting hypothesis of earnings management. However, if the capital market is not efficient and investors are not sophisticated, the management can use EM to entrench itself at the expense of the shareholders, e.g., hide bad news.

On the other hand, if a firm has a weak corporate governance structure, its management has fewer incentives to conduct EM since any repercussion against the management is limited. As reviewed in [Healy and Wahlen \(1999\)](#) and [Fields and Keys \(2003\)](#), previous research has documented a link between corporate governance and earnings quality and the prevalence of EM. For example, [Dechow et al. \(1996\)](#) find that firms with weak corporate governance, e.g., a board of directors dominated by management, are more likely to engage in EM. [Kasanen, Kinnunen, and Niskanen \(1996\)](#) argue that firms faced with a thin security market and concentrated ownership have more incentives to manage earnings upwards to satisfy their investors' demands for smooth dividends. [Lee, Lev, and Yeo \(2007\)](#) find that firms with more independent directors and higher institutional ownership are less likely to engage in earnings management.

Similarly, [Cornett, Marcus, and Tehranian \(2008\)](#) find firms with higher institutional ownership and higher presence of independent directors are associated with a lower level of using discretionary accruals in managing earnings. [Small, Kwag, and Li \(2015\)](#) find that firms with a more democratic corporate governance structure are associated with more EM. Their results are consistent with the conjecture that better corporate governance exhibits a pressure on the management to meet the earning targets, which in turn leads the management to engage in using discretionary accruals in EM.

Ample empirical evidence also suggests that stock liquidity affects earnings management. For instance, [Li and Xia \(2016\)](#) find that firms with less liquid stocks exhibit higher levels of real earnings management. The authors suggest that liquidity curbs earnings management by mitigating the information asymmetry between agents and their principals and facilitates governance by large institutional investors. Both [Teoh, Welch, and Wong \(1998\)](#) and [DuCharme, Malatesta, and Sefcik \(2001\)](#) show that valuations of new equity issues are positively correlated to pre-issue earnings management, suggesting that executives attempt to opportunistically manipulate earnings before approaching new investors in an attempt to raise more cash. [Guthrie and Sokolowsky \(2010\)](#) find that total accruals increase by 2% for those firms with large outside blockholders (holding at least 5% of all outstanding shares) around seasoned equity offerings. In contrast, those firms without large outside blockholders do not have a significant increase in total accruals.

2.3. Testable hypotheses

On the one hand, the agency problems as discussed in [Jensen and Meckling \(1976\)](#) may be more prevalent in MLPs than in traditional corporations. One can argue that GPs of MLPs are not subject to the traditional corporate governance structure. Another governance issue is that while the LP units are publicly traded on a stock exchange, the GP units are not. The inability to trade the GP units makes it very difficult to displace GPs when agency conflicts arise. To make matters worse, most partnership agreements that govern MLPs stipulate that any party accumulating 20% or more ownership of an MLP's outstanding common units lose its voting rights. As stated earlier, most GPs have direct ties to a sponsoring company or entity. As such, the sponsor may use the MLP to maximize its interests ahead of those of the LPs, e.g., divesting nonperforming assets to the MLP and charging favorable rates for the provision of management services, etc. Thus, the pressure is higher for GPs to act in the best interest of the principals at the expenses of LPs. As a result, GPs have more incentives to conduct EM. Indeed, a report by [Moody's Investors Service \(2017\)](#) states that the nature of the separation of ownership and control inherent to the MLPs' corporate governance structure leads the rating agency to suppress MLPs' ratings relative to public corporations with comparable financial metrics. Note that such governance risks are distinct from and in addition to the credit and liquidity risks associated with the MLP business model. The main governance risk as per the report is that GPs use their control to extract value from the MLP to the detriment of their common unitholders.

On the other hand, there are counter-arguments. First, the sponsoring companies have strong incentives to protect their reputation by closely monitoring GP's behavior. Due to proximity, such monitoring can be more effective than a corporate board whose members are not as knowledgeable or has the prior working relationship with GPs. The link that ties sponsoring companies and GPs to their MLPs is a resemblance to family-run firms. [Anderson and Reeb \(2003\)](#) show that founding family ties help reduce agency costs. [Prencipe and Bar-Yosef \(2011\)](#) find that the earnings management behavior in family-controlled businesses is affected less by the number of independent board member but more by CEO's tie to the family. To the extent that the sponsoring company would maximize the MLP's wealth, the incentives to obtain private benefits at the expense of LPs would be fewer. Thus, the long-term ties between sponsoring firms and GPs should reduce opportunistic behavior by GPs. Secondly, as discussed in [Chen and Ngo \(2018\)](#), GPs are compensated by distributed cash flow. Manipulating cash flow may be more difficult than managing earnings.

[Shrieves and Gao \(2002\)](#) and [Bergstresser and Philippon \(2006\)](#) evince that earnings manipulation is more pronounced where executive compensation is more closely tied to the value of shares. However, since GPs receive bonuses from the cash flow distribution, why would a GP even try to manage earnings in the first place? Thirdly, because MLPs have to tap the capital market more frequently than corporations do, the odds of being caught in managing earnings are much higher, which also acts as a deterrent against active earnings management argument. It needs empirical evidence to shed light on whether there is a difference in management behavior under the two organization formats. Therefore, we specify the following two hypotheses.

Discretionary accruals management hypothesis: there is no difference between MLPs and corporations in managing discretionary accruals.

Real activity management hypothesis: there is no difference between MLPs and corporations in managing real activities.

3. Sample selection and methodology

3.1. Sample selection

Following Chen and Ngo (2018), we obtain the list of master-limited partnership firms from the Master Limited Partnership Association and crosscheck the list with the Center for Research in Security Prices (CRSP) and Compustat databases. After merging these into CRSP and Compustat and removing firms in the financial industry (SIC codes = 6000–6999), we are left with 99 MLP firms. We provide the names of the 99 MLP firms in Appendix 1. Our final sample extends from 1995–2015. Although Apache Petroleum Company became the first MLP listed on the NYSE in 1981, the number of listed MLPs in the energy sector was fewer than three in the early 1990s. As such, we start the sample from 1995 in which we have three MLPs. For matching non-MLP firms, we include all corporations that share the same SIC code in the same year as their MLP counterparts – excluding share codes of 70 and 71.

Table 1 reports the sample distribution by year in Panel A and by industry (as classified by the 4-digit SIC code) in Panel B. There is a gradual increase in the number of MLPs over the years. Specifically, the number of MLPs doubles in 2006. As expected, the highest frequency of MLPs occurs in the oil, gas and petroleum industries (19% of the sample). Midstream MLPs such as those engaging in the transmission of gas accounts for 15% of the sample, and retailing MLPs accounts for 14%, respectively. There are 645 MLP-year observations and 7534 non-MLP matching firm-year observations with 930 unique non-MLP matching firms. There is too much representation of crude petroleum and natural gas firms in the matching sample, e.g., 40% vs. 19% for the MLP sample. Later, we perform analyses in which we match each MLP firm with the top 5 and top 10 non-MLP firms closest in size.

3.2. Earnings management measurements

Discretionary accruals (DA), a proxy for accruals-based earnings management, is measured by the difference between the actual and forecasted levels of accruals. As shown in Eq. (1), we first calculate actual accruals.

$$Accruals_{i,t} = EBXI_{i,t} - CFO_{i,t} \quad (1)$$

where *EBXI* represents the earnings before extraordinary items and discontinued operations, and *CFO* represents the cash flows from operations for year *t* and firm *i*. Following the methods in Cohen, Dey, and Lys (2008); Cohen and Zarowin (2010), and Zang (2012), we measure DA by the residual term from the following regression in Eq. (2).

$$\begin{aligned} \frac{Accruals_{i,t}}{Assets_{i,t-1}} = & k_0 + k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} \\ & + k_3 \frac{\Delta PPE_{i,t}}{Assets_{i,t-1}} + e_{i,t} \end{aligned} \quad (2)$$

where *Assets*_{*t*-1} represents total assets in year *t* – 1. $\Delta Sales_{i,t}$ is the change in sales from the preceding year, and *PPE*_{*t*} is the gross value of property, plant and equipment. We estimate the above regression cross-sectionally for all industry-year observations.

We construct the following measures of real activities manipulation: the abnormal level of discretionary expenditure (*RDISX*); the abnormal level of production cost (*RPROD*); and the abnormal level of operating cash flow (*RCFO*). Cohen and Zarowin (2010) suggest that firms that manage their earnings upward tend to have unusually low discretionary expenses, and unusually high produc-

tion costs, and/or low cash flow from operations. *RDISX* represents the residual from the following equation,

$$\frac{DISX_{i,t}}{Assets_{i,t-1}} = k_0 + k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + e_{i,t} \quad (3)$$

where *DISX*_{*t*} is the discretionary expenditures in year *t*, i.e., the sum of research and development (*R&D*), advertising, and selling, general and administrative (*SG&A*) expenditures. *Assets*_{*t*-1} is the total assets in year *t* – 1 and *SALES*_{*t*-1} is the net sales in year *t* – 1. Again, we estimate the above regression cross-sectionally for all industry-year observations.

To obtain abnormal production costs (*RPROD*), we first estimate the normal level of production costs as follows,

$$\begin{aligned} \frac{PROD_{i,t}}{Assets_{i,t-1}} = & k_0 + k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} \\ & + k_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + k_4 \frac{\Delta SALES_{i,t-1}}{Assets_{i,t-1}} + e_{i,t} \end{aligned} \quad (4)$$

where *PROD*_{*t*} is the sum of the cost of goods sold in year *t* and the change in inventory during the year for firm *i*. We conduct a cross-sectional estimation of Eq. (4) for all industry-year observations. The abnormal level of production costs (*RPROD*) is measured as the estimated residual of the regression. Higher residuals are synonymous with increased inventory levels, reduced cost of goods sold, and inflated earnings.

Because the impact of adjusting real activities will affect operating cash flow, Roychowdhury (2006) uses the abnormal level of operating cash flow as the third proxy for real earnings management. Following Roychowdhury (2006), we estimate the following regression and use the residual to measure the abnormal level of operating cash flows, i.e., real earnings management.

$$\begin{aligned} \frac{CFO_{i,t}}{Assets_{i,t-1}} = & \gamma_0 + \gamma_1 \frac{1}{Assets_{i,t-1}} + \gamma_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} \\ & + \gamma_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + e_{i,t} \end{aligned} \quad (5)$$

where *CFO*_{*t*} is the operating cash flow of firm *i* in year *t*. As in estimating the other measurements, we estimate the above regression cross-sectionally for all industry-year observations.¹

Finally, we use the following model to test the two earnings management hypotheses. The dependent variable is an EM measurement. The dependent variable *EM*_{*t*} is a measure of earnings management for firm *i* in year *t*. In addition to the traditional earnings management measures such as *RDISX*, *RPROD*, *RCFO*, and *DA*, we follow Cohen and Zarowin (2010) and Zang (2012) by creating two composite scores, i.e. *RM1*, and *RM2*, which are made up of the three real earnings management variables. First, *RM1* is the sum of *RPROD* and *RDISX*. Second, *RM2* is the sum of all three variables, i.e. *RPR*, *OD*, *RDISX* and, *RCFO*. In each case, the higher the values of *RM1* and *RM2*, the higher is the likelihood that the firm is engaged in real activities manipulations.

$$\begin{aligned} EM_{i,t} = & \beta_0 + \beta_1 MLP_{i,t} + \beta_2 Size_{i,t} + \beta_3 MKTSHARE_{i,t} \\ & + \beta_4 Debt_{i,t} + \beta_5 NOA_{i,t} + \beta_6 OPERCYCLE_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 MKTBK_{i,t} + \beta_9 Liquidity_{i,t} + \beta_{10} Stockissue_{i,t} \end{aligned}$$

¹ We acknowledge that the interpretation of the abnormal level of cash flows as a proxy for real earnings management is not clear-cut. For instance, earnings management measures to increase abnormal production costs could lead to a decrease in cash flows. Conversely, earnings management measures to decrease abnormally discretionary expenditure would produce the opposite effect, i.e. they tend to increase cash flows. Thus, not all firms engaging in real activities manipulations would be associated with abnormally low levels of cash flows from operations.

Table 2
 Sample Descriptive Statistics.

	MLPs				Non-MLPs				MLPs minus Non-MLPs			
	N	Mean	Median	Std Dev	N	Mean	Median	Std Dev	Mean	Median	t-stats	Wilcoxon-stats
DA	643	0.072	0.045	0.229	7,428	0.030	0.028	0.200	0.041	0.017	4.43***	3.94***
RDISX	527	0.193	0.112	0.278	6,601	0.044	0.034	0.238	0.149	0.078	11.93***	14.09***
RPROD	594	0.063	-0.001	0.237	7,151	-0.004	-0.015	0.173	0.067	0.014	6.78***	6.79***
RCFO	645	-0.064	-0.055	0.192	7,458	-0.031	-0.031	0.189	-0.032	-0.024	-4.13***	-4.81***
RM1	501	0.274	0.173	0.415	6,441	0.037	0.015	0.299	0.237	0.157	12.54***	13.08***
RM2	501	0.208	0.142	0.432	6,377	0.004	-0.004	0.321	0.204	0.146	10.33***	10.41***
Assets	645	3,821.73	1,380.47	8,039.94	7,532	8,251.77	904.66	29,914.67	-4,430.04	475.81	-9.47***	5.88***
MKCAP	642	3,009.92	1,152.98	6,066.67	7,507	7,028.22	606.65	27,423.04	-4,018.30	546.34	-10.13***	8.5***
MKTSHARE	645	0.001	0.000	0.003	7,532	0.003	0.000	0.011	-0.002	0.000	-0.81	0.8
DEBT	645	0.581	0.598	0.229	7,531	0.539	0.545	0.244	0.042	0.053	4.43***	5.75***
NOA	645	0.959	0.988	0.078	7,531	0.918	0.960	0.120	0.041	0.028	12.31***	14.44***
OPERCYCLE	592	11.482	16.187	53.447	7,119	-13.411	16.879	2,147.530	24.893	-0.692	0.97	-0.29
ROA	645	0.046	0.041	0.097	7,532	-0.019	0.031	0.255	0.065	0.010	13.49***	6.72***
MKBK	632	3.352	2.192	5.862	7,492	2.210	1.723	3.034	1.142	0.469	4.84***	8.37***
LIQUIDITY	645	0.075	0.057	0.064	7,532	0.173	0.083	2.143	-0.098	-0.026	-3.81***	-3.28***
STOCKISSUE	645	0.127	0.043	0.372	7,532	0.071	0.003	0.331	0.056	0.040	3.70***	5.34***
DEBTISSUE	645	0.290	0.207	0.308	7,532	0.154	0.065	0.252	0.136	0.142	10.91***	12.98***
BIG8	645	0.848	1.000	0.359	7,534	0.817	1.000	0.387	0.031	0.000	2.11**	1.98**
TENURE	645	5.808	4.000	4.799	7,523	7.829	6.000	7.645	-2.021	-2.000	-9.69***	-4.48***
INSTOWN	645	0.241	0.190	0.241	7,534	0.299	0.156	0.378	-0.057	0.034	-5.49***	0.44
NUMANALYST	645	4.442	4.000	3.816	7,534	5.042	1.000	7.619	-0.600	3.000	-3.45***	6.85***

Summary statistics are for MLPs and all Non-MLP firms in the same industry in the same year. DA is the discretionary accrual. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. Assets is total assets. MKCAP is market capitalization. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-asset. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days receivable plus the days inventory less the days payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

$$\begin{aligned}
 & + \beta_{11}Debtissue_{i,t} + \beta_{12}Big8_{i,t} + \beta_{13}Tenure_{i,t} + \beta_{14}Instown_{i,t} \\
 & + \beta_{15}Numanalyst_{i,t} + \beta_{16}SOX_{i,t} + \beta_{17}Resid_RM_{i,t} + e_{i,t} \quad (6)
 \end{aligned}$$

The dummy variable *MLP* takes a value of one for an MLP and zero for corporations, respectively. *SOX* is also a dummy variable to account for any effect from the 2002 Sarbanes-Oxley Act. Zang (2012) argues that managers use real earnings management during the year. By year-end, should there be a need to manage earnings further, then managers engage in discretionary accruals management to make up for the shortfall. Consequently, in the regression of accruals-based earnings management, we include a measure of unexpected real activities manipulation (*RESID_RM*) to proxy for the extent of real earnings management used throughout the year. That is, the unexpected real activities manipulation (*RESID_RM*), i.e., *RESID_RM1* and *RESID_RM2*, are the estimated residuals from Eq. (6) when *RM1* and *RM2* are the dependent variables, respectively.

We follow Zang (2012) and control for other firm characteristics that affect earnings management in Eq. (6). The variable *Size* is the logarithmic value of total assets. *MKTSHARE* is the ratio of firm sales to total sales of all firms in the same industry. *DEBT* is the ratio of debt over total assets. *NOA* is net operating assets, which is calculated as total assets minus cash and short-term investment scaled by total assets. *OPERCYCLE* is the days of receivable plus the days of inventory minus the days of payable at the beginning of the year. *ROA* is net income to total assets ratio. *MKBK* is the market-to-book ratio of equity. *LIQUIDITY* is the average of the ratio of monthly trading volume to shares outstanding in the year. *STOCKISSUE* is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. *DEBTISSUE* is the ratio of the amount of long-term debt issuance to the firm's assets. *BIG8* is a dummy variable coded as one for firms with a top-8 auditor and zero otherwise. *TENURE* is the number of years the auditor has audited the client. *INSTOWN* is the percentage of institutional

ownership. *NUMANALYST* is the number of analysts following the firm as reported by I/B/E/S. All these control variables are measured at the end of the preceding year. In the estimation, we also control for year fixed effects and calculate the *t*-statistics based upon the standard errors corrected for clustering effects by firms.

4. Results

4.1. Univariate analyses

Table 2 presents descriptive statistics on the earnings management variables and other variables used in this study. Panel A presents characteristics of MLPs, while Panel B presents characteristics of non-MLPs. Note that for each MLP firm, we find a matching sample of non-MLP firms that share the same 4-digit SIC code in the same year. Panel C presents tests of differences between the MLP and non-MLP firms. While the average assets and market capitalizations are significantly lower among MLPs as compared to non-MLPs, their median values are significantly higher, which suggests a wide variation in size among the MLPs.

Importantly, though, and directly linked to testing our hypothesis, the findings in Panel C suggest that MLPs have significantly higher discretionary accruals (*DA*), abnormal discretionary expenditures (*RDISX*), abnormal production costs (*RPROD*) and aggregate real activities manipulation (*RM1* and *RM2*) than their matched sample of non-MLP firms have. These univariate findings support the hypothesis that MLPs engage in more earnings management than non-MLPs do. MLPs, however, have significantly lower abnormal operating cash flows (*RCFO*) than matched non-MLP firms have. Such a lower *RCFO* may indicate that GPs are smoothing their cash flow – relative to their corporate counterparts who manage earnings. Note that MLPs are required to pay the vast majority of their earnings out to their partners and, therefore, it makes more sense for GPs to smooth cash flow. Alternatively, one may argue that the

business is more stable for MLPs than for corporations. However, this argument runs against the fact that both MLPs matching corporations are in the same business sector. Furthermore, since the average size of matching corporations is much bigger than that of MLPs, it is not likely that MLPs are more able to steer through business cycles than corporations can. As shown by the variable *MKTSHARE*, which is the ratio of firm sales to total sales of all the firms in the same industry, there is no difference in the measurement of market power between MLPs and matching corporations. Thus, it is not likely that MLPs use their market power in weathering business fluctuations better than the matching corporations do. In addition, as indicated by the variable *OPERCYCLE*, which is the days' receivable plus the days' inventory less the days' payable, there is no significant difference in working capital management efficiency between MLPs and the non-MLP matching firms from the same industry.

Panel C of [Table 2](#) also shows that MLPs have a significantly higher debt-to-assets ratio. Although they cannot deduct interest expenses for tax purpose, MLPs still use considerably more debt than the matching corporations do. We conjecture that this is due to two factors. First, debt is still cheaper than equity even on the before-tax basis. Second, GPs are quite good at managing the financial risk since they with unlimited liability are responsible for any debt default. MLPs also have higher net operating assets than the matching corporations do, indicating that MLPs have to use capital more wisely since they are constrained with limited resources after paying out distributed cash flow. Not surprisingly, both the mean and median values of *STOCKISSUE* and *DEBTISSUE* are significantly higher for MLPs than non-MLPs. As discussed earlier, MLPs have a greater need to access the capital markets more frequently than non-MLPs. MLPs enjoy a higher return on assets. Also, by affording MLPs a higher market-to-book ratio, investors like MLPs more.

On the other hand, MLPs have lower liquidity than the matching corporations in the same industry do, as indicated by the variable *LIQUIDITY*. Although the number of the top-8 auditors used by MLPs is bigger than that used by the non-MLP firms, the average tenure of the auditor is significantly lower among MLP firms. Similarly, the percentage of firm shares held by institutional owners is lower among MLP firms compared to the case with non-MLP firms (24.1% vs. 29.9%). The average number of analysts covering each MLP firm is significantly lower than that of non-MLP firms (4.42 versus 5); however, the median number of analysts covering each MLP firm is higher than that of non-MLP firms (4 versus 1). The higher standard deviation of the number of analysts among non-MLP firms as compared to MLPs suggests a wide dispersion of analyst coverage among non-MLP firms.

4.2. Earnings management between MLPs vs. non-MLP firms – whole sample

The preliminary results in [Table 2](#) suggest that MLP firms engage in more real earnings management than non-MLP firms in the same industry. However, given that many of MLP firms' characteristics are different from those of non-MLP matching firms, the differences in the real earnings management might be attributable to other firm characteristics. In [Table 3](#), we perform the univariate comparison of earnings management measures between MLP firms and non-MLP firms matched on alternative firm characteristics. We match each MLP firm with a non-MLP firm in the same industry with the closest (1) assets (in Panel A), (2) market capitalization (in Panel B), (3) market-to-book ratio (in Panel C), (4) return on asset (in Panel D), (5) debt ratio (in Panel E) and (6) sales growth (in Panel F). The six firm characteristics are obtained for the preceding year. Regardless of the matching criteria, the real earnings management (*RM1* and *RM2*) are consistently and statistically higher among MLP firms.

In [Table 4](#), we report the results from cross-sectional analyses of the earnings management measures. As shown in [Table 4](#), the coefficients for the MLP variable is significantly positive in Models 1 and 2. Therefore, MLPs engage in significantly more real activities adjustments in discretionary expenses and production costs than non-MLP matching firms do. However, the coefficient for the MLP dummy variable in Model 3 is insignificant. This result is different from the univariate result in [Table 2](#) but is consistent with the result in [Table 3](#). Therefore, after controlling for contributing factors such as operating efficiency, institutional ownership, and financial leverage, MLPs are no different from the matching corporations regarding smoothing operating cash flow.

Nevertheless, results from Models 4 and 5 indicate that MLPs do make more adjustment in response to unexpected shocks in demand and supply as the coefficients for the MLP dummy variable are highly significant in both models. Results from Models 6, 7 and 8 show that the coefficients on the MLP variable are statistically insignificant, suggesting that MLP firms do not engage in more accruals-based earnings management than the non-MLP firms do. In Models 7 and 8, the coefficients for both measurements of the likelihood of engaging in real activities management are significantly positive, indicating coordinated earnings management, i.e., those engaging in real activities management also conduct discretionary accruals-based earnings management.²

In the real activities management regressions in Models 1–5, the coefficient on firm size variable is insignificant, and neither is that for the variable of market-to-book ratio. As shown in [Roychowdhury \(2006\)](#), size is negatively related to the abnormal CFO but positively related to both abnormal discretionary expenses and abnormal production costs. However, the variable *MKTSHARE* has a significantly positive coefficient in Models 2–5, indicating a more quickly response from those firms with a larger market share. The other control variables with a significant coefficient are financial leverage, *OPERCYCLE*, *ROA*, number of analysts covering a firm, and the dummy variable *SOX*.

In the discretionary accruals regressions in Models 6, 7 and 8, the coefficients for several control variables have the expected signs. For example, firm size had a significantly positive coefficient, which is consistent with that in [Haw, Hu, Hwang, and Wu \(2004\)](#). Similarly, net operating assets ratio has a significantly negative coefficient, indicating a lower propensity for the managers to engage in earnings management using discretionary accruals. However, several control variables are not significant, e.g., financial leverage, market-to-book ratio, and institutional ownership. Previous studies have produced contrasting results. For example, while [Chung, Firth, and Kim \(2002\)](#) document a significantly negative relation between discretionary accruals management and financial leverage, [Haw et al. \(2004\)](#) find a significantly positive relation. Our result on the profitability variable (*ROA*) also contrasts with that in [Haw et al. \(2004\)](#). Specifically, we find a significantly negative coefficient, which contrasts with the positive coefficient as documented in [Haw et al. \(2004\)](#).

The ownership structure of MLPs warrants a careful discussion on the interpretation of the results in [Tables 2 and 4](#). One may not attribute these results to a lack of internal corporate governance of MLPs. GPs need to manage real activities in response to changes in market conditions more than their corporate counterparts do for the following reasons. First, MLPs need to approach investors for cash more often than corporations do, and their ability to attract new funds directly depends on their ability to generate cash flow.

² The results remain qualitatively unchanged when we repeat the analyses in the two subsamples that only contain the top 5 and top 10 non-MLP firms closest in size, respectively. For the sake of brevity, we do not report them in the paper but are available upon request.

Table 3
 Univariate Comparison of Earnings Management between MLPs and Non-MLP Firms – Alternative Matching Criteria.

Variables	MLPs	Non-MLPs	Difference	t-stats	Wilcoxon-stats
Panel A. MLPs vs. Non-MLPs Closest in Assets					
RDISX	0.198	0.154	0.044	2.62***	3.45***
RPROD	0.065	0.044	0.021	1.46	1.47
RCFO	-0.063	-0.064	0.000	0.03	0.34
RM1	0.282	0.209	0.074	2.7***	3.01***
RM2	0.218	0.146	0.072	2.54**	2.61***
DA	0.067	0.010	0.057	4.61***	5.21***
Panel B. MLPs vs. Non-MLPs Closest in Market Capitalization					
RDISX	0.197	0.163	0.035	1.98**	2.68***
RPROD	0.063	0.020	0.043	3.3***	2.35**
RCFO	-0.065	-0.071	0.006	0.59	1.02
RM1	0.279	0.188	0.091	3.44***	3.43***
RM2	0.214	0.112	0.102	3.75***	3.48***
DA	0.066	0.032	0.035	2.78***	3.29***
Panel C. MLPs vs. Non MLPs Closest in Market-book Ratio					
RDISX	0.200	0.150	0.050	2.83***	2.43**
RPROD	0.065	0.010	0.054	3.81***	3.33***
RCFO	-0.065	-0.070	0.005	0.49	0.66
RM1	0.284	0.163	0.121	4.39***	3.92***
RM2	0.218	0.091	0.127	4.42***	3.95***
DA	0.066	0.025	0.040	3.02***	2.61***
Panel D. MLPs vs. Non MLPs Closest in ROA					
RDISX	0.197	0.153	0.043	2.49**	3.16***
RPROD	0.065	0.007	0.058	4.22***	4.41***
RCFO	-0.063	-0.079	0.016	1.47	1.62
RM1	0.281	0.163	0.118	4.46***	4.63***
RM2	0.216	0.076	0.141	5.14***	4.75***
DA	0.068	0.028	0.040	3.18***	3.47***
Panel E. MLPs vs. Non MLPs Closest in Debt Ratio					
RDISX	0.198	0.141	0.058	3.62***	3.59***
RPROD	0.065	0.034	0.031	2.28**	1.87*
RCFO	-0.063	-0.070	0.007	0.61	0.62
RM1	0.283	0.185	0.098	3.93***	3.47***
RM2	0.218	0.120	0.098	3.75***	3.1***
DA	0.067	0.011	0.056	4.05***	3.81***
Panel F. MLPs vs. Non MLPs Closest in Sales Growth					
RDISX	0.203	0.128	0.075	3.85***	4.46***
RPROD	0.071	-0.012	0.083	5.18***	4.33***
RCFO	-0.060	-0.069	0.009	0.79	1.07
RM1	0.294	0.118	0.177	5.65***	4.78***
RM2	0.234	0.045	0.189	5.95***	5.01***
DA	0.070	0.018	0.052	3.83***	3.58***

This table provides the results from the comparison of earnings management measurements between MLPs and their matching Non-MLP firms in the same industry with the closest in assets (Panel A), market capitalization (Panel B), market-to-book ratio Panel C), return on asset (Panel D), debt ratio (Panel E), and sales growth (Panel F). The matching criteria are obtained for the preceding year. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Secondly, the MLP business model is structured around generating and distributing cash consistently (on a quarterly basis), and its primary objective is to maintain or increase cash distributions to its common unitholders. MLPs' cash distributions to their investors tend to stay relatively stable over time causing them to trade somewhat like bonds. This also makes MLPs highly vulnerable to changes in interest rates. Lately, while interest rates have been stable, it has not always been the case. Indeed, the interest rates that corporations (including MLPs) pay are higher and more volatile than the rates on Treasury securities. Increases in interest rates adversely affect MLPs as investors move funds to the bond market. Many MLPs operate in slow-growing industries, such as pipelines, which offer dim prospects for unit price appreciation. Thus, savings through restructuring activities would serve to mitigate adverse interest rate movements. Thirdly, the bulk of MLPs reside in the energy sector, volatility in energy prices (for instance, oil prices) would hinder MLPs' ability to pay a stable, growing dividend consistently over time. Real earnings management would assist in smoothing out the effects of price volatilities on MLPs' earnings and cash distributions over business cycles. For instance, GPs may elect to decrease discretionary expenses to conserve cash in order to survive a downturn. Similarly, MLPs may also need to convert some of their debt into equity to conserve cash, which requires changes

made to the MLP's operations as well as postponing discretionary expenses.

Kasanen et al. (1996) argue that firms faced with a thin security market and concentrated ownership are incentivized to manage earnings upwards to satisfy their investors' demands for smooth dividends. This would be particularly true of MLPs, whose investors treat the MLP units as fixed-income securities. The authors find that dividend-based earnings significantly explain variations in reported earnings. MLPs provide 12-month forecasts of their cash distributions and, similar to the earnings forecasts of public corporations, the MLP forecasts impose pressure on their GPs to find ways to generate income and cash to pay the planned cash distributions. Otherwise, failure to maintain investors' expectations of the cash distributions would force the trading price of the LP units downward. This pressure to manage earnings and cash creatively is further exacerbated if we consider that MLPs usually distribute cash within days following the reporting period. Finally, MLPs operating in the energy sector tend to be the targets of environmental activists, which results in significant incremental costs – for instance, environmental and legal costs – as well as those related to corporate social responsibility (CSR) activities. To make matters worse and in response to the activists' demands, governments require significantly more diligence from MLPs before

Table 4
 Cross-sectional Analyses of Earnings Management – Whole Sample.

Variables	Model 1 – RDISX	Model 2 –RPROD	Model 3 – RCFO	Model 4 – RM1	Model 5 –RM2	Model 6 – DA	Model 7 – DA	Model 8 – DA
Constant	-0.107 (-2.62***)	-0.023 (-0.77)	0.099 (3.23***)	-0.144 (-2.43**)	-0.032 (-0.51)	0.131 (4.54***)	0.112 (3.79***)	0.112 (3.87***)
MLP	0.133 (3.264***)	0.147 (4.274***)	0.032 (1.535)	0.185 (4.140***)	0.176 (4.398***)	-0.021 (-1.026)	-0.020 (-0.973)	-0.020 (-0.992)
LN(Assets)	0.051 (1.286)	0.063 (1.819*)	-0.040 (-1.316)	0.066 (1.642)	0.042 (1.042)	-0.064 (-2.685***)	-0.062 (-2.381**)	-0.061 (-2.402**)
MKTSHARE	0.028 (1.135)	0.086 (2.425**)	0.039 (3.206***)	0.068 (2.112**)	0.078 (2.633***)	0.007 (0.338)	0.019 (0.786)	0.020 (0.810)
DEBT	0.091 (2.559**)	0.092 (3.323***)	0.055 (2.408**)	0.118 (3.297***)	0.125 (3.970***)	0.006 (0.292)	0.010 (0.481)	0.010 (0.493)
NOA	0.047 (1.544)	-0.012 (-0.501)	-0.079 (-3.116***)	0.026 (0.865)	-0.020 (-0.727)	-0.049 (-2.636***)	-0.037 (-2.063**)	-0.037 (-2.099**)
OPERCYCLE	0.014 (0.583)	0.078 (3.599***)	0.077 (3.573***)	0.053 (2.019**)	0.078 (3.208***)	0.021 (1.252)	0.017 (0.980)	0.017 (0.999)
ROA	0.117 (3.89***)	-0.370 (-13.15***)	-0.299 (-11.11***)	-0.141 (-4.13***)	-0.270 (-9.79***)	0.445 (17.30***)	0.455 (17.05***)	0.455 (17.34***)
MKBK	0.008 (0.269)	-0.023 (-1.078)	-0.033 (-1.685*)	-0.016 (-0.550)	-0.030 (-1.364)	0.007 (0.327)	0.019 (0.848)	0.019 (0.853)
LIQUIDITY	-0.041 (-1.884*)	0.010 (0.496)	0.023 (1.062)	-0.021 (-0.947)	-0.008 (-0.377)	0.014 (0.662)	0.012 (0.549)	0.012 (0.547)
STOCKISSUE	-0.034 (-1.518)	-0.009 (-0.449)	0.038 (2.272**)	-0.025 (-0.902)	-0.006 (-0.243)	0.027 (1.638)	0.034 (2.035**)	0.034 (2.025**)
DEBTISSUE	-0.040 (-1.622)	0.016 (0.650)	-0.035 (-1.704*)	-0.018 (-0.672)	-0.028 (-1.091)	-0.011 (-0.623)	-0.016 (-0.869)	-0.016 (-0.870)
BIG8	0.029 (1.004)	-0.011 (-0.427)	-0.026 (-1.029)	0.014 (0.472)	0.005 (0.162)	-0.055 (-2.555**)	-0.053 (-2.401**)	-0.053 (-2.407**)
TENURE	0.052 (1.481)	0.014 (0.574)	0.005 (0.200)	0.053 (1.924*)	0.053 (2.265**)	0.031 (1.761*)	0.026 (1.525)	0.026 (1.459)
INSTOWN	0.038 (1.205)	0.053 (1.812*)	-0.012 (-0.487)	0.059 (1.694*)	0.047 (1.757*)	-0.017 (-0.910)	-0.014 (-0.711)	-0.014 (-0.728)
NUMANALYST	-0.046 (-1.537)	-0.060 (-2.114**)	-0.023 (-0.972)	-0.062 (-2.008**)	-0.069 (-2.468**)	0.029 (1.539)	0.033 (1.865*)	0.032 (1.837*)
SOX	0.267 (1.166)	-0.356 (-2.370**)	-0.448 (-2.737***)	-0.018 (-0.083)	-0.289 (-1.846*)	0.176 (1.341)	0.222 (1.672*)	0.222 (1.693*)
RESID_RM1							0.126 (4.174***)	
RESID_RM2								0.140 (6.151***)
Adj. R-squared	0.09	0.18	0.15	0.10	0.14	0.18	0.21	0.21
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,051	6,695	6,744	5,977	5,931	6,723	5,913	5,913

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RDISX, RPROD, RCFO, RM1, RM2 and DA, alternatively. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

granting them the necessary permits (for instance, in the case of a pipeline project). These costs would weigh heavily on the MLPs' earnings, forcing them to make cuts elsewhere (i.e., by engaging in the restructuring of real transactions).

MLPs are under more monitoring by external forces such as creditors, institutional owners, analysts, and auditors. We test whether such external forces moderate the ability of MLPs to engage in earnings management in the following sections.

4.3. Earnings management between MLPs vs. non-MLP firms – financial leverage

Since MLPs are required to pay the majority of their earnings out to their partners, they are in constant need of cash. For years, the US has maintained a low-interest rate policy that has allowed MLPs to borrow cheaply while passing the lion's share of their earnings to their unitholders (Aneiro, 2014). Therefore, there is

an important relationship between MLPs and their lenders and creditors. We test whether highly leveraged MLPs manage earnings differently from less financially leveraged MLPs. We select a subsample of firms with lower than the yearly sample median debt-to-assets ratio as low leveraged firms and a subsample of firms with a higher-than-median debt-to-assets ratio as highly leveraged firms. As shown in Table 5 Panel A (Models 1 and 2) and Panel B (Models 1 and 2), the coefficient for the MLP dummy variable is significantly positive, indicating a consistent propensity for MLPs, with the degree of financial leverage being irrelevant, to conduct real activities management. However, results in Models 3 and 4 in Panel A show no association between discretionary accruals and MLPs in the subsample of low-levered firms. Conversely, in the subsample of high-levered firms, the coefficient of MLP is negative at the 10% significance level, suggesting an inverse association between MLPs and discretionary accruals management (Models 3 and 4 in Panel B). These results in Panel B are expected as highly

Table 5
 Cross-sectional Analyses of Earnings Management – Low-levered Firms vs. High-levered Firms.

Variables	Panel A – Low-levered Firms				Panel B – High-levered Firms			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.066 (-1.03)	0.010 (0.15)	0.123 (3.73***)	0.125 (3.93***)	-0.163 (-1.38)	0.039 (0.31)	0.111 (1.78*)	0.104 (1.64)
MLP	0.096 (2.62***)	0.100 (3.09***)	0.026 (1.03)	0.025 (1.01)	0.227 (3.780***)	0.214 (3.88***)	-0.045 (-1.76*)	-0.043 (-1.70*)
LN(Assets)	0.104 (2.02**)	0.094 (1.71*)	-0.108 (-2.88***)	-0.113 (-3.07***)	0.053 (0.98)	0.002 (0.03)	-0.056 (-1.78*)	-0.051 (-1.60)
MKTSHARE	-0.027 (-1.26)	-0.002 (-0.08)	0.007 (0.58)	0.008 (0.64)	0.104 (3.0***)	0.115 (3.68***)	0.025 (0.70)	0.027 (0.73)
DEBT	0.039 (0.91)	0.046 (1.19)	0.061 (2.45**)	0.062 (2.51**)	0.064 (1.53)	0.071 (1.88*)	-0.019 (-0.72)	-0.019 (-0.70)
NOA	0.035 (0.75)	-0.015 (-0.35)	-0.059 (-2.25**)	-0.060 (-2.37**)	0.014 (0.43)	-0.029 (-0.92)	-0.015 (-0.68)	-0.014 (-0.62)
OPERCYCLE	0.071 (1.92*)	0.085 (2.51**)	0.010 (0.44)	0.012 (0.58)	0.040 (1.136)	0.079 (2.61***)	0.023 (0.85)	0.021 (0.75)
ROA	-0.161 (-3.72***)	-0.350 (-9.93***)	0.415 (10.68***)	0.428 (10.89***)	-0.146 (-3.50***)	-0.221 (-5.81***)	0.473 (12.90***)	0.465 (12.90***)
MKBK	-0.150 (-4.06***)	-0.140 (-4.50***)	-0.003 (-0.09)	0.000 (0.01)	0.027 (0.81)	-0.004 (-0.14)	0.023 (0.78)	0.025 (0.86)
LIQUIDITY	-0.017 (-0.47)	-0.016 (-0.50)	0.011 (0.48)	0.013 (0.54)	-0.024 (-0.92)	0.002 (0.09)	0.019 (0.55)	0.017 (0.49)
STOCKISSUE	-0.013 (-0.47)	-0.001 (-0.04)	0.045 (1.52)	0.046 (1.51)	-0.044 (-1.14)	-0.022 (-0.65)	0.022 (1.27)	0.022 (1.28)
DEBTISSUE	-0.043 (-1.69*)	-0.038 (-1.44)	-0.034 (-1.57)	-0.034 (-1.58)	-0.001 (-0.04)	-0.018 (-0.51)	-0.012 (-0.48)	-0.011 (-0.44)
BIG8	-0.026 (-0.55)	-0.045 (-1.01)	-0.055 (-1.97**)	-0.052 (-1.87*)	0.044 (1.23)	0.045 (1.25)	-0.048 (-1.55)	-0.049 (-1.58)
TENURE	0.062 (1.93*)	0.067 (1.95*)	0.016 (0.80)	0.015 (0.69)	0.064 (1.62)	0.060 (2.36**)	0.037 (1.48)	0.038 (1.42)
INSTOWN	0.022 (0.40)	-0.005 (-0.12)	-0.076 (-2.17**)	-0.073 (-2.08**)	0.074 (1.54)	0.070 (1.80*)	0.009 (0.56)	0.009 (0.51)
NUMANALYST	-0.035 (-0.69)	-0.032 (-0.74)	0.090 (3.11***)	0.088 (3.00***)	-0.060 (-1.80*)	-0.066 (-2.05**)	0.014 (0.73)	0.013 (0.67)
SOX	0.054 (0.24)	-0.357 (-2.86***)	0.348 (1.760*)	0.365 (1.98**)	-0.076 (-0.23)	-0.224 (-0.74)	0.136 (0.89)	0.120 (0.76)
RESID_RM1			0.113 (2.60***)				0.134 (3.38***)	
RESID_RM2				0.149 (4.65***)				0.129 (4.19***)
Adj. R-squared	0.07	0.14	0.17	0.18	0.09	0.12	0.24	0.24
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,065	3,034	3,019	3,019	2,912	2,897	2,894	2,894

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFD. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFD is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

indebted MLPs would, therefore, be under greater scrutiny from their lenders and creditors, which deters manipulating earnings by accruing and deferring costs and revenues. Again, the coefficients for the likelihood of real activities management variable are significantly positive in Models 3 and 4 in both panels. Thus, those engaging in real activities management are associated with engaging in discretionary accruals-based earnings management.

For the control variables, there is a sharp difference between the two samples. The only variable with a consistent sign in the two samples is ROA, which is significant in all models. In the regressions involving the two composite scores for real activities management, the market-to-book ratio is significant only in the regressions in the sample of the low-levered firm, whereas the variable MKTSHARE is significant in the sample of high-levered firms. Even though financial leverage is not significant in any of the real activities management regressions, the coefficient for the variable

MKBK is significantly negative. Examining a large sample across 37 countries, Zhe, Li, and Yu (2016) document a significantly positive association between earnings management and a firms' financial leverage. If the market-to-book ratio is a proxy for growth opportunities, a significantly negative coefficient for MKBK could suggest that those growing firms conduct less real activities management, probably reflecting a less need. Notice that growing firms such as tech firms tend to have low financial leverage.

4.4. Earnings management between MLPs vs. non-MLP firms – institutional ownership

Chung et al. (2002) find that institutional investors have the resources and expertise to monitor managers' earnings manipulation practices. Guthrie and Sokolowsky (2010) also find large blockholders exert a pressure on the management and affect its

Table 6
 Cross-sectional Analyses of Earnings Management – Low Institutional Ownership vs. High Institutional Ownership.

Variables	Panel A – Low Institutional Ownership				Panel B – High Institutional Ownership			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.183 (-2.89***)	-0.050 (-0.71)	0.149 (4.09***)	0.148 (4.26***)	-0.065 (-0.64)	0.001 (0.01)	0.030 (0.62)	0.037 (0.75)
MLP	0.241 (3.92***)	0.223 (4.094**)	-0.022 (-0.89)	-0.025 (-1.01)	0.121 (2.89***)	0.121 (2.97***)	-0.010 (-0.34)	-0.014 (-0.48)
LN(Assets)	0.025 (0.51)	-0.002 (-0.03)	-0.101 (-3.23***)	-0.098 (-3.22***)	0.122 (2.25**)	0.114 (2.13**)	-0.032 (-0.83)	-0.032 (-0.82)
MKTSHARE	0.025 (0.63)	0.031 (0.87)	-0.001 (-0.10)	0.003 (0.21)	0.122 (3.62***)	0.129 (4.78***)	0.031 (0.66)	0.033 (0.68)
DEBT	0.084 (1.73*)	0.076 (1.80*)	0.006 (0.18)	0.011 (0.35)	0.124 (2.70***)	0.156 (3.67***)	0.030 (1.21)	0.027 (1.09)
NOA	0.099 (2.68***)	0.038 (1.10)	-0.051 (-2.03**)	-0.054 (-2.22**)	-0.051 (-1.23)	-0.081 (-2.12**)	-0.007 (-0.26)	-0.010 (-0.41)
OPERCYCLE	0.020 (0.52)	0.040 (1.32)	0.011 (0.40)	0.014 (0.54)	0.100 (3.13***)	0.126 (3.72***)	0.023 (0.89)	0.025 (0.95)
ROA	-0.095 (-2.0**)	-0.268 (-6.73***)	0.534 (13.17***)	0.532 (13.44***)	-0.223 (-6.53***)	-0.282 (-9.81***)	0.364 (10.72***)	0.355 (10.76***)
MKBK	-0.058 (-1.52)	-0.043 (-1.40)	0.028 (0.80)	0.026 (0.74)	0.030 (0.86)	-0.017 (-0.60)	0.006 (0.24)	0.012 (0.48)
LIQUIDITY	-0.032 (-1.08)	-0.008 (-0.28)	0.037 (1.0)	0.036 (0.97)	-0.018 (-0.58)	-0.027 (-0.88)	-0.021 (-0.90)	-0.018 (-0.74)
STOCKISSUE	-0.044 (-1.08)	-0.018 (-0.56)	0.030 (1.15)	0.030 (1.17)	-0.006 (-0.29)	0.004 (0.17)	0.031 (1.62)	0.032 (1.71*)
DEBTISSUE	-0.077 (-2.28**)	-0.086 (-2.74***)	-0.054 (-1.97**)	-0.050 (-1.85*)	0.040 (1.17)	0.028 (0.84)	0.011 (0.44)	0.013 (0.51)
BIG8	-0.011 (-0.28)	-0.021 (-0.51)	-0.029 (-1.07)	-0.028 (-1.02)	0.056 (1.47)	0.047 (1.30)	-0.067 (-2.12**)	-0.066 (-2.08**)
TENURE	0.035 (1.33)	0.047 (1.66*)	0.030 (1.74*)	0.029 (1.74*)	0.043 (0.95)	0.025 (0.68)	0.026 (0.97)	0.028 (0.934)
INSTOWN	0.024 (0.77)	0.006 (0.21)	-0.026 (-1.11)	-0.024 (-1.09)	0.046 (1.23)	0.040 (1.59)	0.018 (1.16)	0.017 (1.05)
NUMANALYST	-0.009 (-0.35)	-0.023 (-0.86)	0.030 (1.88*)	0.030 (1.94*)	-0.107 (-2.5**)	-0.105 (-2.62***)	0.042 (1.49)	0.040 (1.37)
SOX	0.189 (0.69)	-0.103 (-0.49)	0.399 (2.34**)	0.390 (2.37**)	-0.215 (-0.76)	-0.491 (-2.87***)	0.035 (0.290)	0.031 (0.24)
RESID_RM1			0.084 (2.03**)				0.168 (3.86***)	
RESID_RM2				0.140 (4.40***)				0.135 (4.02***)
Adj. R-squared	0.10	0.13	0.26	0.27	0.14	0.20	0.15	0.14
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,691	2,664	2,651	2,651	3,286	3,267	3,262	3,262

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

earnings management behavior. Likewise, Kim, Miller, Wan, and Wang (2016) provide evidence of effective monitoring by institutional investors on the behavior of earnings management. As mentioned earlier, not all institutional investors invest in MLPs. For instance, pension funds are not allowed to hold MLP units without incurring tax liability. It is only recently that mutual funds are allowed to invest in MLPs. As a result, the distribution of institutional ownership differs between MLPs and non-MLPs firms, which may affect the relationship between their ownership and MLP earnings management practices. Whether or not institutional investors monitor MLPs is an empirical question that we seek to answer in this section.

In Table 6, we report the cross-sectional analyses of earnings management activities for the subsample of firms with lower than the yearly sample median institutional ownership percentage in Panel A and the subsample of firms with higher-than-median insti-

tutional ownership percentage in Panel B. Both categories of MLPs are associated with higher real earnings management compared to non-MLPs peers (Models 1 and 2 from both panels). There is no association between discretionary accruals and MLPs (Models 3 and 4 from both panels). Given that large sections of institutional investors shun the MLP units for tax reasons, we may not find the usual inverse association between institutional ownership and earnings management in MLPs. There is also solid evidence that firms are engaging in both kinds of earnings management as shown in Models 3 and 4 in both panels.

4.5. Earnings management between MLPs vs. non-MLP firms – analyst coverage

Yu (2008) documents that firms followed by more analysts manage their discretionary accruals less. Sun and Liu (2016), on the

Table 7
 Cross-sectional Analyses of Earnings Management – Low Analyst Coverage vs. High Analyst Coverage.

Variables	Panel A – Low Analyst Coverage				Panel B – High Analyst Coverage			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.100 (-1.65*)	0.023 (0.33)	0.125 (3.45***)	0.121 (3.50***)	-0.203 (-1.69*)	-0.116 (-1.12)	0.089 (1.81*)	0.088 (1.83*)
MLP	0.145 (4.19***)	0.132 (4.20***)	-0.034 (-1.42)	-0.035 (-1.46)	0.175 (2.75***)	0.178 (3.075***)	-0.011 (-0.35)	-0.015 (-0.50)
LN(Assets)	0.029 (0.57)	0.017 (0.32)	-0.067 (-2.27**)	-0.066 (-2.26**)	0.096 (2.01**)	0.069 (1.55)	-0.056 (-1.59)	-0.052 (-1.46)
MKTSHARE	0.017 (0.41)	0.028 (0.77)	-0.010 (-1.05)	-0.006 (-0.48)	0.123 (3.78***)	0.126 (4.57***)	0.035 (0.70)	0.040 (0.78)
DEBT	0.057 (1.22)	0.071 (1.74*)	0.005 (0.16)	0.010 (0.33)	0.169 (3.40***)	0.183 (4.24***)	0.035 (1.35)	0.039 (1.49)
NOA	0.069 (1.82*)	0.013 (0.35)	-0.044 (-1.79*)	-0.046 (-1.99**)	-0.003 (-0.08)	-0.044 (-1.25)	-0.026 (-0.99)	-0.026 (-1.05)
OPERCYCLE	0.041 (1.19)	0.048 (1.65)	0.014 (0.57)	0.019 (0.78)	0.075 (2.22**)	0.128 (3.940***)	0.029 (1.37)	0.026 (1.27)
ROA	-0.126 (-2.68***)	-0.277 (-6.75***)	0.520 (13.17***)	0.516 (13.27***)	-0.180 (-3.10***)	-0.268 (-7.18***)	0.358 (13.95***)	0.353 (15.80***)
MKBK	-0.075 (-2.25**)	-0.050 (-1.77*)	0.047 (1.34)	0.046 (1.31)	0.037 (0.92)	-0.022 (-0.69)	-0.025 (-1.24)	-0.015 (-0.71)
LIQUIDITY	-0.017 (-0.56)	-0.003 (-0.09)	0.029 (0.81)	0.029 (0.80)	-0.018 (-0.57)	-0.021 (-0.72)	-0.013 (-0.59)	-0.010 (-0.44)
STOCKISSUE	-0.065 (-1.47)	-0.029 (-0.82)	0.020 (0.79)	0.021 (0.85)	0.017 (0.83)	0.022 (1.07)	0.046 (2.31**)	0.050 (2.55**)
DEBTISSUE	-0.035 (-1.08)	-0.052 (-1.57)	-0.050 (-1.97**)	-0.047 (-1.87*)	0.001 (0.03)	0.004 (0.12)	0.015 (0.57)	0.014 (0.52)
BIG8	-0.004 (-0.09)	-0.036 (-0.82)	-0.027 (-0.96)	-0.022 (-0.80)	0.032 (0.93)	0.053 (1.65)	-0.078 (-2.60***)	-0.081 (-2.63***)
TENURE	0.006 (0.24)	0.002 (0.06)	0.011 (0.60)	0.015 (0.85)	0.086 (1.93*)	0.075 (2.12**)	0.034 (1.18)	0.037 (1.14)
INSTOWN	0.019 (0.54)	0.022 (0.77)	-0.029 (-1.21)	-0.029 (-1.22)	0.045 (1.27)	0.052 (1.76*)	0.010 (0.58)	0.007 (0.39)
NUMANALYST	0.002 (0.07)	-0.032 (-1.07)	0.003 (0.14)	0.007 (0.34)	-0.114 (-2.93***)	-0.099 (-2.76***)	0.064 (2.33**)	0.058 (2.00**)
SOX	0.055 (0.21)	-0.240 (-1.38)	0.228 (1.50)	0.225 (1.53)	-0.283 (-4.52***)	-0.522 (-9.08***)	0.212 (5.18***)	0.192 (4.76***)
RESID_RM1			0.055 (1.42)				0.206 (4.89***)	
RESID_RM2				0.134 (4.138***)				0.142 (4.38***)
Adj. R-squared	0.06	0.10	0.25	0.26	0.17	0.22	0.16	0.13
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,801	2,767	2,754	2,754	3,176	3,164	3,159	3,159

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

other hand, find that high analyst coverage leads to more real earnings management. They thus conclude that analyst coverage cannot constrain real activities manipulation. To the extent that analysts can serve as external monitors to managers, we expect the positive relationship between MLP status and earnings management to be more prevalent among firms with low analyst coverage. In Table 7, we report the cross-sectional analyses of earnings management activities for the subsample of firms with lower than the yearly sample median number of covering analysts in Panel A and the subsample of firms with higher than the sample median in Panel B. Both categories of MLP are associated with higher real earnings management compared to non-MLP firms (Models 1 and 2 from both panels). This could be due to the heterogeneity inherent among MLPs as evidenced in Table 1 where the 99 MLPs are distributed across 19 industry sectors. MLPs also differ in complexity due to the nature of the assets they operate (for instance, pipeline assets represent only a subset of MLPs), their capital structure, partner-

ship structures and a myriad of other factors making it difficult for analysts to treat MLPs as a homogenous class of business entities.

4.6. Earnings management between MLPs vs. non-MLP firms – auditors' tenures

Ghosh and Moon (2005) and Gul, Fung, and Jaggi (2009) show that the length of auditors' tenure is positively associated with earnings quality. It takes time for auditors to appreciate the business intricacies of their clients, although this is possible over the long run. In the short run, a newly appointed auditor relies more on the estimates produced by the client. Next, newly appointed auditors are more lax in the early years in an attempt to retain the client over the long run. Finally, yet importantly, high-quality auditors are likely to terminate high-risk clients. In Table 8, we test whether auditors' tenure affects the extent to which MLPs engage in earnings management. We report the cross-sectional analyses

Table 8
 Cross-sectional Analyses of Earnings Management – Short Tenure vs. Long Tenure.

Variables	Panel A – Short Tenure				Panel B – Long Tenure			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.141 (-2.0**)	0.003 (0.04)	0.165 (3.65***)	0.162 (3.68***)	-0.153 (-2.08**)	-0.051 (-0.68)	0.069 (2.12**)	0.070 (2.183**)
MLP	0.166 (4.10***)	0.133 (3.71***)	-0.030 (-0.92)	-0.026 (-0.86)	0.194 (3.19***)	0.210 (3.83***)	-0.012 (-0.51)	-0.016 (-0.69)
LN(Assets)	0.076 (1.62)	0.005 (0.12)	-0.090 (-2.58**)	-0.085 (-2.39**)	0.043 (0.82)	0.060 (1.08)	-0.041 (-1.16)	-0.047 (-1.33)
MKTSHARE	0.083 (2.63***)	0.082 (2.83***)	0.040 (0.69)	0.040 (0.70)	0.056 (1.20)	0.072 (1.63)	0.004 (0.25)	0.005 (0.31)
DEBT	0.085 (2.10**)	0.100 (2.78***)	-0.004 (-0.14)	-0.004 (-0.12)	0.155 (3.44***)	0.153 (3.70***)	0.025 (0.89)	0.028 (0.98)
NOA	0.024 (0.66)	-0.021 (-0.62)	-0.058 (-2.41**)	-0.059 (-2.42**)	0.025 (0.72)	-0.026 (-0.78)	-0.018 (-0.82)	-0.018 (-0.83)
OPERCYCLE	0.005 (0.16)	0.050 (1.54)	0.037 (1.58)	0.037 (1.60)	0.109 (3.33***)	0.111 (3.85***)	-0.011 (-0.55)	-0.006 (-0.32)
ROA	-0.160 (-3.82***)	-0.268 (-7.66***)	0.468 (11.83***)	0.464 (11.95***)	-0.113 (-2.39**)	-0.258 (-7.17***)	0.443 (13.36***)	0.448 (13.32***)
MKBK	-0.041 (-1.40)	-0.030 (-1.10)	0.025 (0.80)	0.023 (0.72)	0.013 (0.31)	-0.022 (-0.664)	0.010 (0.37)	0.014 (0.49)
LIQUIDITY	-0.051 (-1.73*)	-0.039 (-1.40)	0.020 (0.54)	0.021 (0.58)	0.011 (0.40)	0.025 (0.9)	-0.003 (-0.13)	-0.002 (-0.09)
STOCKISSUE	-0.070 (-1.68*)	-0.046 (-1.34)	0.032 (1.45)	0.034 (1.53)	0.036 (1.81*)	0.050 (2.63***)	0.033 (1.51)	0.034 (1.57)
DEBTISSUE	-0.016 (-0.49)	-0.032 (-1.04)	-0.042 (-1.46)	-0.041 (-1.44)	-0.020 (-0.49)	-0.022 (-0.58)	0.021 (1.06)	0.020 (1.01)
BIG8	0.007 (0.19)	0.009 (0.27)	-0.040 (-1.31)	-0.041 (-1.35)	0.032 (0.77)	0.013 (0.30)	-0.065 (-2.55**)	-0.064 (-2.53**)
TENURE	0.012 (0.58)	0.001 (0.04)	-0.007 (-0.38)	-0.005 (-0.29)	0.034 (0.915)	0.046 (1.48)	0.035 (1.35)	0.032 (1.18)
INSTOWN	0.072 (1.68*)	0.063 (1.52)	-0.010 (-0.36)	-0.011 (-0.40)	0.044 (1.25)	0.039 (1.44)	-0.016 (-0.67)	-0.018 (-0.78)
NUMANALYST	-0.077 (-2.24**)	-0.085 (-2.39**)	0.039 (1.64)	0.041 (1.69*)	-0.049 (-1.25)	-0.059 (-1.78*)	0.034 (1.57)	0.033 (1.54)
SOX	-0.465 (-3.01***)	-0.606 (-5.67***)	0.209 (3.70***)	0.214 (4.14***)	0.219 (1.07)	-0.119 (-0.85)	0.250 (1.12)	0.266 (1.18)
RESID_RM1			0.093 (2.47**)				0.164 (4.12***)	
RESID_RM2				0.134 (4.508***)				0.142 (4.46***)
Adj. R-squared	0.08	0.12	0.22	0.23	0.12	0.18	0.20	0.19
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,753	2,732	2,723	2,723	3,224	3,199	3,190	3,190

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

of earnings management activities for the subsample of firms with lower than the yearly sample median auditor tenure in Panel A and the subsample of firms with higher than the sample median in Panel B. Both categories of MLP are associated with higher real earnings management compared to non-MLP firms (Models 1 and 2 from both panels).

Due to the complexity of MLP operations as explained in the preceding section, auditors are more likely to focus on discretionary accruals management, i.e., inappropriate accrual and deferral of revenues and expenses. An auditor can easily express an opinion on using the accounting principles and guidelines, and it is more difficult to detect justifiably real earnings management (RM) since RM constitutes changes to real transactions and does not violate GAAP. Consistent with this proposition, the coefficient for the dummy variable MLP is insignificant in Models 3 and 4 in both panels.

4.7. Earnings management between MLPs vs. non-MLP firms – low-liquidity vs. high-liquidity

For corporations, Li and Xia (2016) find that firms with less liquid stocks are more likely to engage in real earnings management. Intuitively, a few driven investors can make their displeasure known to other investors if the stock has low liquidity. Earlier, we hypothesized that the pool of MLP investors is relatively smaller than the pool of investors who invest in the stocks of traditional corporations. This restriction also decreases the liquidity of MLPs' common units relative to the liquidity of common stocks. The higher the liquidity, the higher is the threat of exit by disgruntled shareholders caused by earnings management. To test the inverse association between stock liquidity and earnings management, we separate the sample into two, i.e., the sample of below-median liquidity versus the sample of above-median liquidity in Table 9.

Table 9
 Cross-sectional Analyses of Earnings Management – Low Liquidity vs. High Liquidity.

Variables	Panel A – Low Liquidity				Panel B – High Liquidity			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.111 (-1.80*)	-0.009 (-0.12)	0.101 (2.87***)	0.101 (2.90***)	-0.200 (-2.04**)	-0.081 (-0.81)	0.115 (2.26**)	0.112 (2.31**)
MLP	0.292 (5.18***)	0.253 (4.76***)	-0.008 (-0.28)	-0.007 (-0.26)	0.031 (0.93)	0.056 (1.89*)	-0.003 (-0.12)	-0.009 (-0.32)
LN(Assets)	0.051 (1.02)	0.003 (0.05)	-0.016 (-0.48)	-0.013 (-0.38)	0.122 (2.28**)	0.128 (2.47**)	-0.090 (-2.48**)	-0.095 (-2.63***)
MKTSHARE	0.067 (2.0**)	0.081 (2.52**)	0.006 (0.34)	0.007 (0.40)	0.056 (1.04)	0.068 (1.40)	0.037 (0.86)	0.036 (0.82)
DEBT	0.132 (2.97***)	0.145 (3.59***)	-0.041 (-1.53)	-0.042 (-1.57)	0.100 (2.20**)	0.099 (2.43**)	0.060 (2.02**)	0.062 (2.08**)
NOA	0.020 (0.68)	-0.025 (-0.86)	-0.035 (-1.45)	-0.036 (-1.462)	0.029 (0.60)	-0.020 (-0.45)	-0.045 (-1.92*)	-0.045 (-1.95*)
OPERCYCLE	0.018 (0.54)	0.028 (1.08)	-0.001 (-0.03)	0.003 (0.1)	0.091 (2.71***)	0.126 (3.82***)	0.026 (1.12)	0.025 (1.08)
ROA	-0.123 (-3.17***)	-0.260 (-7.28***)	0.403 (11.13***)	0.404 (11.23***)	-0.157 (-3.43***)	-0.282 (-7.79***)	0.507 (13.85***)	0.506 (13.89***)
MKBK	-0.030 (-0.87)	-0.032 (-1.09)	0.040 (1.32)	0.039 (1.30)	-0.005 (-0.15)	-0.029 (-0.97)	0.004 (0.12)	0.005 (0.18)
LIQUIDITY	0.005 (0.15)	0.010 (0.35)	0.044 (2.03**)	0.044 (2.02**)	-0.042 (-1.53)	-0.018 (-0.68)	-0.000 (-0.02)	-0.002 (-0.08)
STOCKISSUE	0.010 (0.50)	0.034 (1.53)	0.021 (0.964)	0.019 (0.88)	-0.046 (-1.05)	-0.034 (-1.00)	0.039 (1.64)	0.040 (1.69*)
DEBTISSUE	-0.043 (-1.25)	-0.035 (-1.0)	-0.024 (-0.83)	-0.026 (-0.89)	0.015 (0.45)	-0.016 (-0.48)	-0.013 (-0.68)	-0.010 (-0.48)
BIG8	0.016 (0.40)	0.009 (0.22)	-0.068 (-2.27**)	-0.068 (-2.28**)	-0.009 (-0.22)	-0.021 (-0.5)	-0.045 (-1.66*)	-0.045 (-1.68*)
TENURE	0.034 (1.42)	0.038 (1.45)	0.016 (0.83)	0.016 (0.85)	0.056 (1.28)	0.045 (1.33)	0.030 (1.20)	0.032 (1.15)
INSTOWN	0.005 (0.13)	0.020 (0.55)	-0.005 (-0.19)	-0.006 (-0.25)	0.081 (1.69*)	0.055 (1.80*)	-0.028 (-0.96)	-0.026 (-0.99)
NUMANALYST	-0.016 (-0.53)	-0.007 (-0.24)	-0.001 (-0.05)	-0.004 (-0.18)	-0.123 (-2.90***)	-0.142 (-3.86***)	0.042 (1.72*)	0.044 (1.82*)
SOX	-0.506 (-3.90***)	-0.612 (-5.07***)	0.034 (0.25)	0.029 (0.21)	0.468 (2.86***)	0.061 (0.35)	0.411 (2.32**)	0.439 (2.81**)
RESID_RM1			0.0986 (2.25**)				0.159 (4.07***)	
RESID_RM2				0.116 (3.44***)				0.157 (5.51***)
Adj. R-squared	0.13	0.16	0.17	0.18	0.08	0.13	0.24	0.24
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,861	2,820	2,809	2,809	3,116	3,111	3,104	3,104

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

Consistent with our prediction, the dummy variable MLP in the regressions of real earnings management (i.e., Models 1 and 2) is statistically significant in the subsample of low liquidity firms only.

4.8. Earnings management between MLPs vs. non-MLP firms – small stock/debt issuers vs. large stock/debt issuers

We also hypothesized that, unlike traditional corporations, MLPs need to access the capital markets for funding more often since they pay a lot of dividends and retain very little earnings. We further posited that MLPs' ability to attract new funds would be directly dependent on their earnings capacity, forcing GPs to look for ways to maximize earnings in as much as is possible. Table 10 breaks the sample into two, i.e., small stock issue comprises of firm-year observations where STOCKISSUE is below the sample median,

and large stock issue comprises of observations where the variable is above the median. We observe that MLPs are associated with more real earnings management in both subsamples (i.e., Models 1 and 2 of Panels A and B).

In Table 11, we replace the STOCKISSUE with DEBTISSUE, and the findings stay the same, i.e., MLPs continue to be positively associated with real activities manipulations irrespective of the size of the debts they issued. Nonetheless, the issuance of new securities seems to affect the extent of discretionary accruals. Under both small stock and debt issues, MLPs are associated with lower discretionary accruals (see Models 3 and 4 in Panel A of both Tables 10 and 11 where the coefficient of the variable MLP is significantly negative). In summary, while we find that MLPs engage in real earnings management under all kinds of security issue, that relationship is unaffected by issue size, unlike discretionary accruals.

Table 10
 Cross-sectional Analyses of Earnings Management – Small Stock Issue vs. Large Stock Issue.

Variables	Panel A – Small Stock Issue				Panel B – Large Stock Issue			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.045 (-0.69)	0.078 (1.10)	0.098 (2.82***)	0.099 (2.94***)	-0.243 (-3.10***)	-0.137 (-1.63)	0.135 (2.81***)	0.135 (2.91***)
MLP	0.186 (3.44***)	0.189 (4.05***)	-0.045 (-2.02**)	-0.046 (-2.08**)	0.176 (3.85***)	0.160 (3.55***)	0.001 (0.02)	0.002 (0.06)
LN(Assets)	0.062 (1.18)	0.063 (1.19)	-0.083 (-2.55**)	-0.086 (-2.68***)	0.091 (1.92*)	0.046 (0.97)	-0.065 (-1.71*)	-0.062 (-1.64)
MKTSHARE	0.074 (1.71*)	0.094 (2.14**)	0.020 (1.36)	0.020 (1.353)	0.063 (1.59)	0.061 (1.79*)	0.014 (0.35)	0.016 (0.41)
DEBT	0.114 (2.52**)	0.129 (3.11***)	-0.020 (-0.76)	-0.020 (-0.80)	0.110 (2.74***)	0.118 (3.42***)	0.060 (1.69*)	0.060 (1.68*)
NOA	-0.023 (-0.72)	-0.076 (-2.41**)	-0.033 (-1.41)	-0.032 (-1.42)	0.072 (1.87*)	0.030 (0.86)	-0.049 (-(-1.94*)	-0.050 (-2.04**)
OPERCYCLE	0.066 (2.23**)	0.063 (2.167**)	0.008 (0.33)	0.012 (0.50)	0.041 (1.24)	0.091 (3.11***)	0.023 (1.04)	0.020 (0.91)
ROA	-0.140 (-3.60***)	-0.258 (-7.36***)	0.425 (14.60***)	0.424 (15.08***)	-0.163 (-3.86***)	-0.285 (-8.33***)	0.495 (11.33***)	0.494 (11.35***)
MKBK	0.034 (1.03)	-0.027 (-0.93)	0.007 (0.35)	0.013 (0.71)	-0.059 (-1.51)	-0.029 (-0.93)	0.030 (0.80)	0.025 (0.64)
LIQUIDITY	0.013 (0.47)	0.024 (0.86)	-0.023 (-0.79)	-0.023 (-0.78)	-0.051 (-2.0**)	-0.050 (-1.80*)	0.028 (0.89)	0.030 (0.94)
STOCKISSUE	-0.034 (-1.21)	-0.035 (-1.49)	0.030 (1.59)	0.031 (1.61)	-0.043 (-1.03)	-0.012 (-0.34)	0.032 (1.39)	0.032 (1.35)
DEBTISSUE	-0.023 (-0.67)	-0.021 (-0.62)	0.009 (0.43)	0.008 (0.36)	-0.014 (-0.42)	-0.041 (-1.30)	-0.050 (-1.67*)	-0.047 (-1.57)
BIG8	0.019 (0.48)	-0.005 (-0.13)	-0.015 (-0.63)	-0.013 (-0.54)	0.003 (0.08)	0.011 (0.31)	-0.075 (-2.32**)	-0.077 (-2.38**)
TENURE	0.063 (2.09**)	0.065 (2.27**)	0.033 (1.55)	0.033 (1.48)	0.044 (1.34)	0.039 (1.46)	0.013 (0.63)	0.014 (0.66)
INSTOWN	0.127 (2.55**)	0.128 (2.82***)	-0.022 (-0.70)	-0.024 (-0.78)	0.023 (0.91)	0.002 (0.06)	-0.014 (-0.58)	-0.012 (-0.52)
NUMANALYST	-0.107 (-2.51**)	-0.133 (-3.69***)	0.068 (2.63***)	0.071 (2.68***)	-0.043 (-1.25)	-0.032 (-0.94)	0.008 (0.33)	0.004 (0.19)
SOX	-0.180 (-0.94)	-0.440 (-3.28***)	0.248 (1.51)	0.246 (1.52)	0.753 (5.87***)	0.373 (3.35***)	0.317 (2.71***)	0.316 (2.76***)
RESID_RM1			0.139 (3.72***)				0.120 (2.82***)	
RESID_RM2				0.143 (4.17***)				0.142 (4.78***)
Adj. R-squared	0.09	0.15	0.20	0.20	0.11	0.14	0.22	0.22
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,169	3,148	3,138	3,138	2,808	2,783	2,775	2,775

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

MLPs may choose to renegotiate the maturity of their existing debt obligations and, to be able to do so, they may have to adjust discretionary accruals to move certain financial ratios toward the desired level. After this effort, MLPs move to issue either new debt or stocks. Since issuing new debt and stocks are much more serious, MLPs inevitably have to reduce discretionary expenditure and find ways to maximize the cash flows from their operations, i.e., to engage in real activities management. MLPs may also find that they need to convert some of their debt into equity to conserve cash, which requires changes made to the MLP's operations as well as postponing discretionary expenses. Therefore, the results in Tables 10 and 11 are not surprising.

4.9. Earnings management between MLPs vs. Non-MLP firms – before SOX vs. after SOX

Aono and Guan (2008) present evidence that the 2002 Sarbanes-Oxley Act (SOX) has a deterring impact on earnings management. Similarly, Cohen et al. (2008) find that firms make more use of real earnings management and less use of discretionary accruals management following SOX. Thus, the SOX legislation could also affect MLPs significantly in their earnings management behavior. We test for its effect on MLPs and present the findings in Table 12.

As shown in Table 12 Panel A and Panel B, the coefficient for the MLP dummy variable is significantly positive, suggesting higher real activities manipulation among MLPs irrespective of the legisla-

Table 11
 Cross-Sectional Analyses of Earnings Management – Small Debt Issue vs. Large Debt Issue.

Variables	Panel A – Small Debt Issue				Panel B – Large Debt Issue			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.163 (-2.57**)	-0.081 (-1.19)	0.103 (3.14***)	0.107 (3.38***)	-0.125 (-1.42)	0.039 (0.43)	0.140 (2.55**)	0.135 (2.38**)
MLP	0.187 (3.42***)	0.169 (3.52***)	-0.069 (-3.80***)	-0.068 (-3.77***)	0.181 (3.81***)	0.173 (3.71***)	-0.002 (-0.08)	-0.003 (-0.10)
LN(Assets)	0.038 (0.67)	0.016 (0.30)	-0.076 (-2.28**)	-0.076 (-2.27**)	0.092 (2.05**)	0.068 (1.44)	-0.057 (-1.86*)	-0.057 (-1.89*)
MKTSHARE	0.033 (0.94)	0.054 (1.68*)	0.005 (0.32)	0.005 (0.37)	0.116 (2.85***)	0.106 (3.09***)	0.033 (0.66)	0.036 (0.68)
DEBT	0.102 (2.35**)	0.117 (3.05***)	0.011 (0.39)	0.011 (0.39)	0.117 (3.00***)	0.115 (3.185***)	0.022 (0.94)	0.023 (0.97)
NOA	0.063 (1.63)	0.014 (0.376)	-0.039 (-1.60)	-0.042 (-1.76*)	-0.004 (-0.13)	-0.048 (-1.78*)	-0.041 (-1.78*)	-0.040 (-1.63)
OPERCYCLE	0.056 (1.80*)	0.073 (2.36**)	0.022 (0.85)	0.024 (0.94)	0.048 (1.64)	0.075 (2.82***)	0.007 (0.36)	0.007 (0.36)
ROA	-0.123 (-2.97***)	-0.288 (-8.58***)	0.448 (9.80***)	0.453 (10.03***)	-0.162 (-3.90***)	-0.254 (-6.91***)	0.472 (16.38***)	0.467 (16.44***)
MKBK	-0.043 (-1.27)	-0.059 (-2.29**)	0.020 (0.54)	0.021 (0.57)	0.013 (0.40)	-0.006 (-0.21)	0.013 (0.47)	0.013 (0.49)
LIQUIDITY	-0.025 (-0.82)	0.018 (0.62)	0.035 (0.84)	0.030 (0.71)	-0.014 (-0.58)	-0.028 (-1.12)	-0.004 (-0.24)	-0.000 (-0.01)
STOCKISSUE	-0.057 (-1.38)	-0.031 (-0.89)	0.046 (2.016**)	0.046 (2.00**)	-0.002 (-0.10)	0.008 (0.38)	0.020 (0.96)	0.022 (1.02)
DEBTISSUE	0.013 (0.53)	0.020 (0.95)	0.014 (0.82)	0.013 (0.71)	-0.001 (-0.02)	-0.005 (-0.17)	-0.034 (-1.46)	-0.035 (-1.50)
BIG8	0.012 (0.27)	-0.002 (-0.04)	-0.047 (-1.67*)	-0.046 (-1.65)	0.014 (0.45)	0.008 (0.24)	-0.048 (-1.71*)	-0.049 (-1.73*)
TENURE	0.069 (2.12**)	0.065 (2.24**)	0.005 (0.26)	0.006 (0.27)	0.034 (1.15)	0.041 (1.60)	0.060 (3.11***)	0.059 (2.97***)
INSTOWN	0.058 (1.19)	0.016 (0.39)	-0.086 (-2.72***)	-0.081 (-2.54**)	0.062 (1.57)	0.064 (1.89*)	0.016 (1.03)	0.014 (0.89)
NUMANALYST	-0.060 (-1.27)	-0.044 (-1.04)	0.083 (3.17***)	0.079 (2.94***)	-0.063 (-2.11**)	-0.080 (-2.67***)	0.016 (0.87)	0.018 (0.97)
SOX	0.157 (0.52)	-0.214 (-1.06)	0.364 (2.35**)	0.375 (2.58**)	-0.341 (-6.54***)	-0.493 (-5.36***)	-0.045 (-0.30)	-0.059 (-0.37)
RESID_RM1			0.127 (3.06***)				0.132 (3.60***)	
RESID_RM2				0.146 (4.18***)				0.136 (4.86***)
Adj. R-squared	0.09	0.15	0.19	0.19	0.11	0.14	0.23	0.23
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,021	2,987	2,972	2,972	2,956	2,944	2,941	2,941

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

tion. However, there is a decline in the magnitude of the coefficient of the dummy variable representing MLPs before and after SOX (compare Models 1 and 2 from Panel A to those from Panel B). Thus, while there are signs that the SOX legislation has adversely affected MLPs' real activities, it has however not eliminated such earnings management practices (Table 12).

5. Conclusion

We compare earnings management practices between MLPs and their matching corporations from the same SIC codes throughout 1995–2015. Although there is no significant difference regarding managing discretionary accruals, MLPs manage real activities more than their corporate counterparts do. Specifically, MLPs have significantly lower abnormal cash flows than the matched corporations do. Notice that MLPs are required to pay the vast majority of their earnings out to their partners and

the management of an MLP receives most of its bonus and executive compensation from the distributed cash flow. Therefore, lower abnormal cash flow is desirable to both the management and the shareholders. The findings are robust to other factors such as leverage, institutional ownership, analyst coverage, auditors' tenure, and the 2002 Sarbanes-Oxley Act. However, we find that MLPs with less stock market liquidity are associated with more real earnings manipulations than the matching corporations, whereas MLPs with high stock market liquidity do not engage in more real activities management than the matching corporations.

If the difference in corporate governance between the two was the key driver of the difference in earnings management behavior between MLPs and the matching corporations, we would expect these characteristic variables such as leverage, institutional ownership, analysts' coverage, to have a moderating effect on the lack of a sound governance structure by the MLPs. We do not observe any moderating effect. Therefore, we attribute to the fundamen-

Table 12
Cross-sectional Analyses of Earnings Management – Before vs. After SOX.

Variables	Panel A – Before SOX				Panel B – After SOX			
	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA	Model 1 – RM1	Model 2 – RM2	Model 3 – DA	Model 4 – DA
Constant	-0.206 (-2.63***)	-0.091 (-0.99)	0.099 (2.40**)	0.103 (2.61***)	-0.051 (-0.71)	0.019 (0.25)	0.130 (3.33***)	0.136 (3.40***)
MLP	0.268 (5.67***)	0.214 (4.23***)	0.006 (0.28)	-0.007 (-0.28)	0.176 (3.77***)	0.172 (3.95***)	-0.032 (-1.36)	-0.035 (-1.50)
LN(Assets)	0.055 (0.97)	0.052 (0.95)	-0.056 (-1.61)	-0.058 (-1.72*)	0.077 (1.83*)	0.041 (0.98)	-0.070 (-2.35**)	-0.067 (-2.28**)
MKTSHARE	0.037 (0.98)	0.056 (1.85*)	-0.015 (-1.11)	-0.011 (-0.73)	0.090 (1.91*)	0.094 (2.10**)	0.034 (0.90)	0.036 (0.93)
DEBT	0.081 (1.86*)	0.085 (1.98**)	-0.016 (-0.50)	-0.010 (-0.31)	0.118 (2.75***)	0.134 (3.59***)	0.036 (1.38)	0.035 (1.31)
NOA	0.078 (1.88*)	0.019 (0.46)	-0.050 (-1.71*)	-0.055 (-1.96*)	-0.015 (-0.45)	-0.046 (-1.47)	-0.020 (-0.96)	-0.024 (-1.11)
OPERCYCLE	0.030 (0.92)	0.039 (1.25)	0.022 (0.94)	0.029 (1.28)	0.080 (2.50**)	0.111 (3.83***)	0.010 (0.46)	0.010 (0.44)
ROA	-0.074 (-1.52)	-0.262 (-5.93***)	0.475 (10.47***)	0.475 (10.55***)	-0.201 (-4.97***)	-0.291 (-9.58***)	0.463 (15.95***)	0.456 (15.39***)
MKBK	-0.029 (-0.77)	-0.042 (-1.11)	0.081 (2.13**)	0.083 (2.24**)	-0.008 (-0.21)	-0.025 (-0.97)	-0.014 (-0.53)	-0.013 (-0.49)
LIQUIDITY	-0.071 (-1.91*)	-0.049 (-1.34)	0.008 (0.31)	0.013 (0.52)	-0.012 (-0.48)	-0.000 (-0.00)	0.004 (0.13)	0.004 (0.16)
STOCKISSUE	-0.006 (-0.17)	0.000 (0.00)	-0.006 (-0.25)	-0.007 (-0.26)	-0.033 (-1.06)	-0.007 (-0.31)	0.054 (2.54**)	0.053 (2.44**)
DEBTISSUE	-0.017 (-0.50)	-0.041 (-1.21)	-0.050 (-1.62)	-0.048 (-1.56)	0.002 (0.07)	-0.006 (-0.18)	-0.001 (-0.04)	-0.000 (-0.01)
BIG8	0.021 (0.46)	0.005 (0.10)	0.002 (0.06)	0.002 (0.08)	0.001 (0.02)	-0.005 (-0.15)	-0.069 (-2.55**)	-0.071 (-2.60***)
TENURE	0.041 (1.34)	0.061 (2.14**)	0.061 (2.75***)	0.059 (2.69***)	0.059 (1.63)	0.049 (1.61)	0.013 (0.63)	0.015 (0.64)
INSTOWN	0.068 (1.31)	0.072 (1.62)	-0.050 (-1.70*)	-0.055 (-1.91*)	0.064 (1.62)	0.045 (1.62)	-0.005 (-0.22)	-0.004 (-0.20)
NUMANALYST	-0.079 (-1.84*)	-0.088 (-2.22**)	0.018 (0.677)	0.021 (0.82)	-0.057 (-1.60)	-0.064 (-2.00**)	0.048 (2.31**)	0.048 (2.28**)
RESID_RM1			0.031 (0.97)				0.180 (4.66***)	
RESID_RM2				0.148 (4.45***)				0.138 (4.83***)
Adj. R-squared	0.12	0.13	0.25	0.27	0.11	0.16	0.20	0.18
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,293	2,249	2,242	2,242	3,684	3,682	3,671	3,671

The sample includes MLPs and all Non-MLP firms in the same industry in the same year. The dependent variables are RM1, RM2 and DA, alternatively. RM1 is the sum of RDISX and RPROD. RM2 is the sum of RDISX, RPROD and RCFO. RDISX is the abnormal discretionary expenditure. RPROD is the abnormal production costs. RCFO is the abnormal cash flow. DA is the discretionary accrual. MLP is the dummy variable for MLP firms. LN(Assets) is the natural log of total assets. MKTSHARE is the ratio of firm sales to total sales of all firms in the same industry. DEBT is the ratio of debt-to-assets. NOA is net operating assets and is calculated as total assets minus cash and short-term investment scaled by total assets. OPERCYCLE is the days of receivable plus the days of inventory less the days of payable at the beginning of the year. ROA is net income to total assets ratio. MKBK is the market-to-book ratio of equity. LIQUIDITY is the average of the ratio of monthly trading volume to shares outstanding in the year. STOCKISSUE is the ratio of the amount of sales of common stock and preferred stock in the year to the market capitalization of the firm. DEBTISSUE is the ratio of the amount of long-term debt issuance to the firm's assets. BIG8 is the dummy variable for firms with auditors in the top 8. TENURE is the number of years the auditor has audited the client. INSTOWN is the percentage of institutional ownership at the beginning of year. NUMANALYST is the number of analysts following the firm. RESID_RM1 and RESID_RM2 are the residuals from Models 4 and 5. *, **, and *** indicate the significance levels of 10%, 5% and 1%, respectively.

tal features associated with MLPs, i.e., mandatory distribution of cash flow, as the key driver for the observed behavior difference between MLPs and their matching corporations. As MLPs are highly dependent on the capital market for additional funding and the product market for incomes, the management of

MLPs has to be more proactive and act quickly in response to changes in the market conditions than their corporate counterparts do. Our results are thus consistent with the efficient contracting hypothesis of earnings management for the general partners of MLPs.

Appendix 1. The Lit of Master-Limited Partners in the Sample

Access Midstream Partners LP	Dynagas LNG Partners LP	ONEOK Partners, L.P.
Alliance Holdings GP, L.P.	EQT Midstream Partners, LP	PBF Logistics LP
Alliance Resource Partners, L.P.	EV Energy Partners, L.P.	PennTex Midstream Partners, LP
Alon USA Partners, LP	Emerge Energy Services LP	Phillips 66 Partners LP
AmeriGas Partners, L.P.	EnLink Midstream Partners, LP	Plains All American Pipeline, L.P.
American Midstream Partners, LP	Enable Midstream Partners, L.P.	Rhino Resource Partners LP
Andeavor Logistics LP	Enbridge Energy Partners, L.P.	Rice Midstream Partners LP
Antero Midstream Partners LP	Energy Transfer Equity, L.P.	Rose Rock Midstream, L.P.
Arc Logistics Partners LP	Energy Transfer Partners, L.P.	Sanchez Production Partners LP
Archrock Partners, L.P.	Enterprise Oil PLC	Shell Midstream Partners, L.P.
Atlas Energy Group, LLC	Enterprise Products Partners L.P.	Southcross Energy Partners, L.P.
Azure Midstream Partners, LP	Ferrellgas Partners, L.P.	Spectra Energy Partners
Black Stone Minerals, L.P.	Foresight Energy LP	Sprague Resources LP
Blueknight Energy Partners, L.P.	GasLog Partners LP	Star Gas Partners, L.P.
Boardwalk Pipeline Partners, L.P.	Genesis Energy, L.P.	Suburban Propane Partners LP
BreitBurn Energy Partners L.P.	Global Partners LP	Summit Midstream Partners LP
Buckeye Partners, L.P.	Golar LNG Partners LP	SunCoke Energy Partners, L.P.
CNX Coal Resources LP	Green Plains Partners LP	Sunoco LP
CONE Midstream Partners LP	Hi-Crush Partners LP	Sunoco Logistics Partners, L.P.
CSI Compressco Partners LP	Holly Energy Partners, L.P.	Tallgrass Energy Partners, LP
CVR Partners, LP	JP Energy Partners LP	Terra Nitrogen Company, L.P.
CVR Refining, LP	KNOT Offshore Partners LP	Transmontaigne Partners, L.P.
Calumet Specialty Products Partners, L.P.	Legacy Reserves, L.P.	Transocean Partners LLC
Capital Product Partners L.P.	MPLX LP	USA Compression Partners, LP
Cheniere Energy Partners	Magellan Midstream Partners, L.P.	USD Partners LP
Ciner Resources LP	Martin Midstream Partners, L.P.	VTI Energy Partners LP
Columbia Pipeline Partners LP	Memorial Production Partners LP	Vanguard Natural Resources, LLC
Crestwood Equity Partners LP	Mid-Con Energy Partners, LP	Western Gas Equity Partners, LP
CrossAmerica Partners LP	Midcoast Energy Partners, L.P.	Western Gas Partners, L.P.
Cypress Energy Partners, L.P.	NGL Energy Partners LP	Western Refining Logistics, LP
DCP Midstream Partners, L.P.	Navios Maritime Midstream Partners L.P.	Westlake Chemical Partners LP
Delek Logistics Partners, LP	NuStar Energy, L.P.	Westmoreland Resource Partners, LP
Dominion Midstream Partners, LP	NuStar GP Holdings, LLC	World Point Terminals, LP

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