Journal of Contemporary Accounting and Economics 16 (2020) 100202

Contents lists available at ScienceDirect

Journal of Contemporary Accounting and Economics

journal homepage: www.elsevier.com/locate/jcae

How do stock-for-stock acquirers manage earnings? The accruals feature of real earnings management

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ARTICLE INFO

Article history:
Received 26 June 2019
Revised 4 March 2020
Accepted 2 April 2020
Available online 20 April 2020

JEL classification:
G34
M41

Keywords:
Corporate mergers
Discretionary current accruals
Real earnings management

ABSTRACT

This paper investigates whether stock-for-stock acquirers undertake real activities to manage earnings before merger announcements. Our results show that stock-for-stock acquirers present unusually high levels of credit sales and overproduction in the quarter immediately before the merger announcement. We also find that the accruals feature of real earnings management can explain the stock-for-stock acquirers' high discretionary current accruals. In addition, stock-for-stock acquirer firms that accelerate their credit sales experience subsequent market underperformance. Overall, we provide a novel insight into the accruals feature of real earnings management.

1. Introduction

In a stock-for-stock merger, the higher stock price of the acquirer firm on the agreement date benefits the acquirer by lowering the number of shares used to purchase the target firm, thus reducing the cost of the acquisition. Previous studies show that acquirers exhibit higher discretionary current accruals (DCA) in the quarter immediately before their stock-for-stock merger announcement, suggesting engagement in managing current accruals, and attribute acquirers' subsequent underperformance to the reversal effects and litigation costs of the upward current accruals (Erickson and Wang, 1999; Gong et al., 2008; Louis, 2004). In this paper, we reinvestigate the upward management of current accruals of stock-for-stock acquirers (stock acquirers) from the perspective of real earnings management (REM).

Our motives for this investigation stem from the fact that merger announcements are important events that attract attention from market participants (Liu and McConnell, 2013; Louis and Sun, 2010; Maksimovic and Phillips, 2001; Schoar, 2002). Acquirers come under market scrutiny and have limited ability to engage in accrual-based earnings management (AEM) (Burnett et al., 2012; Chi et al., 2011; Cohen and Zarowin, 2010; Graham et al., 2005; Zang, 2012). Therefore, it is of interest to investigate whether stock acquirers use an alternative mean to boost their pre-merger earnings.

In this paper, we argue that stock acquirers tend to use REM rather than AEM, and that REM explains stock acquirers' high DCA in prior studies. We provide three reasons for the argument. First, Cohen and Zarowin (2010) and Kothari et al. (2016)

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https://doi.org/10.1016/j.jcae.2020.100202
1815-5669/

state that compared to AME, REM is difficult for market participants to identify because it relates to arranging ordinary business activities. Second, although auditors and regulators may sense that firms manage their operational activities, regulatory authorities cannot challenge the arrangement of ordinary business activities if the outcomes are properly disclosed (Chi et al., 2011; Graham et al., 2005; Lo, 2008; Zang, 2012). Third, among the various methods of REM, accelerating sales through more lenient credit terms and reducing the costs of goods sold (COGS) through overproduction naturally lead to an increase in accounts receivable and inventories, respectively. As indicated by Sloan (1996), variation in current accruals is attributable mainly to variation in receivables and inventory.

The sample for this paper consists of 586 pure stock-for-stock and 1695 pure cash purchase mergers announced between January 1990 and December 2013. We follow previous studies (Erickson and Wang, 1999; Louis, 2004) and focus on stock-for-stock mergers, treating the cash purchase mergers (cash acquirers) as a control sample. We find that compared to cash acquirers, stock acquirers experience higher sales manipulation in the quarter immediately before the merger announcement because they boost credit sales. In support, we find that stock acquirers present an increased number of days in collection of receivables, which is not derived from underestimating the allowance for uncollectible accounts, indicating a low possibility of engagement in AEM. Furthermore, we find that stock acquirers overproduce to reduce their costs per unit. The overproduced inventory and reduced COGS are supported by increasing days in holding inventories and growing gross margin in the quarter immediately before the stock-for-stock merger announcement, respectively.

We further perform Sobel-Goodman mediation tests and find significant indirect effects of doing stock-for-stock mergers on DCA through sales manipulation or overproduction. Moreover, our results indicate that stock acquirers' DCA are indistinguishable from cash acquirers' after controlling for the effect of sales manipulation and overproduction. Regarding the economic significance, over 35% and 22% of the relation between merger methods and DCA are mediated by sales manipulation and overproduction, respectively. The above findings support our position that stock acquirers' high DCA are derived from REM.

We run several robustness tests. First, we divide DCA into two portions that can and cannot be explained by REM. We find that stock acquirers have higher explained DCA but indistinguishable unexplained DCA compared to cash acquirers, suggesting that higher DCA in stock acquirers are a phenomenon of REM. Second, we perform a propensity score matching approach because cash and stock acquirers have significantly different characteristics. We obtain similar results from the sample consisting of stock acquirers and matched cash acquirers. Third, instead of cash acquirers, we use non-merger firms as an alternative control group. We focus on non-merger firms that are not suspected of managing earnings and obtain similar results.

Our empirical results provide extensive evidence of the association between stock-for-stock mergers and REM. We find that stock acquirers that accelerate their credit sales experience subsequent market and operating underperformance. Our results provide no evidence that the post-merger underperformance is associated with DCA. While prior studies partly attribute long-term underperformance after stock-for-stock mergers to the reversal effects and litigation costs associated with pre-merger DCA (Gong et al., 2008; Louis, 2004), our findings suggest that the long-term underperformance is associated with distorted business activities.

Our paper makes several important contributions. First, this paper identifies that stock acquirers' high DCA are actually the by-product of REM. Our finding echoes Dechow et al. (2010)'s and Lo (2008)'s arguments that the assumption of earnings management incentives is reasonable only if market participants cannot detect earnings management. Second, our findings indicate a potential association between overpriced firm values and REM. Firms engage in earnings management to prolong the overvaluation of equity (Badertscher, 2011; Yang and Abeysekera, 2019), and overvaluation-induced earnings management leads to the long-run erosion of shareholder wealth (Chi and Gupta, 2009; Jensen, 2005). Our findings suggest that stock acquirers' subsequent underperformance is mainly derived from REM rather than AEM. Third, our paper extends the literature that examines the relation between AEM and REM. Our study is different from Zang (2012) and others (Burnett et al., 2012; Chan et al., 2015; Chang and Chen, 2018; Cohen et al., 2008; Cohen and Zarowin, 2010; Enomoto et al., 2015; Halabi et al., 2019), who examine the trade-off or substitution between REM and AEM. Zang (2012) expects and finds a negative association between the proxies of REM and those of AEM. We examine the relation from a different angle. For stock-for-stock acquirers, we expect and find that REM contributes to DCA, creating a positive association between REM measures and DCA. Roychowdhury (2006) claims that REM affects cash flows and in some cases, accruals, but few studies investigate how the accruals feature of REM influences reported accruals.[1] Our evidence suggests that efforts to examine the feature of reported accruals without considering REM are incomplete.

The rest of this paper is organized as follows. Section 2 discusses the literature and develops hypotheses. Section 3 describes our sample. Section 4 examines REM prior to the merger announcement. Sections 5 and 6 perform robustness tests and additional tests, respectively. Section 7 provides the conclusion.

[1] Our paper is very different from Zhu and Lu (2013), who also examine the issue of REM before mergers, in theoretical and empirical aspects. First, they do not explain acquirers' incentives to use REM. By contrast, we demonstrate why stock acquirers use REM rather than AEM. Second, they focus on the presence of pre-merger REM, while we discuss the attribute of REM, which leads to high discretionary current accruals. Third, they examine all types of overvalued acquirers; however, we focus on stock acquirers.

2. Literature review and hypotheses development

In a stock-for-stock merger, the number of the acquirer's shares exchanged for each share of the target firm is determined by the acquirer's stock price. Thus, the stock acquirer has incentives to increase its stock price on the agreement date to lower the number of shares issued to acquire the target firm, which induces the acquirer to manage pre-merger earnings upward. Started from Erickson and Wang (1999), the prior literature finds that relative to cash acquirers, stock acquirers exhibit higher DCA in the quarter immediately before the merger announcement accordingly. Louis (2004) takes a further step and finds that the reversal effects of pre-merger DCA are a significant determinant of stock acquirers' long-term underperformance. Subsequently, Gong et al. (2008) attribute the post-merger underperformances partly to the litigation costs of upward current accruals.

However, merger activities make acquirers attract close scrutiny from market participants. For example, Comp-U-Card International, Inc. (CUC) merged with Hospitality Franchise Systems, Inc., on December 17, 1997. CUC management artificially inflated its earnings, which was soon discovered in April 1998. As a result, E. Kirk Shelton, the former Vice Chairman of CUC, was sentenced to 120 months in prison and ordered to pay criminal restitution of $3.275 billion in 2010.[2] Therefore, market participants may recognize that stock acquirers have incentives and opportunities to manage their earnings (Louis, 2004). Taken together, how exactly a stock acquirer manages its earnings and, at the same time, avoids market security is the issue of interest in this study.

Earnings management can be broadly classified into AEM and REM. The former involves the selection of accounting procedures or estimates that conform with Generally Accepted Accounting Principles (GAAP).[3] The latter consists of departures from normal operational practices that are motivated by a firm's desire to mislead investors into believing certain financial reporting goals have been met in the normal activities of operations (Roychowdhury, 2006). Examples include sales manipulation, overproduction, and discretionary expenditure reduction. First, to accelerate sales from the next fiscal year to the current year, firms may offer a price discount or extend more lenient credit terms near the end of the period. Sales manipulation leads to lower current-period cash flows from operating activities (CFO) than what is normal, given the sales level. Second, with higher production levels, firms may spread fixed overhead costs over a more significant number of units and lower fixed costs per unit, which suggests that the firms may have a lower reported COGS. Third, certain discretionary expenditures are generally expensed under the requirement of GAAP, such as research and development expenditures, selling, general and administrative expenditures, and advertising expenditures. Firms may reduce these discretionary expenditures to lower cash outflows and increase earnings in the current period. Among these examples of REM, engaging in sales manipulation and overproduction affects DCA.

Pressure from public scrutiny motivates us to review the accruals feature of REM in stock-for-stock mergers. We argue that stock acquirers tend to use REM, and that their high DCA in previous studies are derived from sales manipulation and overproduction. The reasons are as follows. First, REM is difficult for auditors and regulators to scrutinize because it relates to the arrangement of ordinary business activities (Graham et al., 2005; Lo, 2008; Zang, 2012). These operational activities typically fall outside auditors' and regulators' oversight responsibility (Cohen and Zarowin, 2010). In surveys, executives reveal a preference for REM relative to manipulating accruals (Bruns and Merchant, 1990; Graham et al., 2005).

Second, because there is no clear distinction between REM and the legitimate reallocation of business resources, compared to AEM, REM is easy for managers to justify. Moreover, REM cannot be directly susceptible to class-action lawsuits unless executives issue misleading disclosures (Huang et al., 2019). Despite adverse consequences ex-post, the "business judgment" principle enables executives to employ their best judgment in their actions, a fact that provides legal cover for REM.

Third, as Roychowdhury (2006, p. 336) stated, "Real activities manipulation affects cash flows and in some cases, accruals." Specifically, the acceleration of the timing of sales through more lenient credit terms increases accounts receivable, and overproducing to spread fixed overhead costs leads to an increase in inventories. The accruals feature of credit sales and overproduction also echo the fact that variation in current accruals is attributable primarily to variation in receivables and inventory (Sloan, 1996), and provides a potential explanation for the high DCA of stock acquirers. In an anecdotal example, Kraft Foods Group, Inc. (Kraft), announced a stock-for-stock merger with Heinz, Kite Merger Sub Corp. on March 24, 2015. In the Form-4 merger proxy, Kraft disclosed that it had engaged in an acceleration of sales ahead of the U.S. Project Keystone go-live in the prior year, which caused a decrease in sales by 7.0% in 2015 from the previous year. Even though Kraft Foods Group Inc. did not mention that the purpose of its acceleration of sales before the stock-for-stock merger was to increase pre-merged earnings, this example provides insight into our study.

Taken together, given the reasons stated above, we suggest that stock acquirers use REM in the pre-merger period and formulate the following hypothesis:

Hypothesis. Stock acquirers' discretionary current accruals are mediated by real earnings management, all else being equal.

[2] See Securities and Exchange Commission v. Walter A. Forbes and E. Kirk Shelton, 01 civ 987 (JAP) (D.N.J. filed Feb. 28, 2001) (Release No. AAER 3138, Lit Rel No. 21548).

[3] Examples include underestimating bad debt expenses and delaying asset write-offs. Generally, AEM is related to managing paper gains or losses without influencing cash flows.

3. Sample selection and descriptive statistics

Our sample covers mergers of publicly traded U.S. firms that were announced between January 1990 and December 2013. We investigate the pattern of earnings management measures during the three quarters surrounding the merger announcement. We require lagged and yearly-change data from cash flow statements to estimate earnings management measures; thus, we start our sample period in 1990. The sample of mergers is obtained from the Security Data Company's (SDC) database. We include a merger transaction in our sample if the merger transaction satisfies the criteria similar to those of Louis (2004) and Gong et al. (2008) (see Appendix A for detailed descriptions).

Our sample includes stock-for-stock mergers and cash purchase mergers for three reasons. First, firms tending to engage in mergers may have characteristics different from those of non-merger firms. Second, a corporate merger increases accounting complexity and thus increases the incidence of accidental accounting errors, regardless of merger methods (Lennox et al., 2018). According to the merger tendency and accounting complexity, we examine acquirers' earnings management behavior, where stock and cash acquirers have higher and fewer earnings management incentives, respectively. Third, this setting allows us to provide empirical results comparable with those of prior studies (Erickson and Wang, 1999; Louis, 2004). The final sample consists of 2281 mergers, including 586 pure stock-for-stock and 1695 pure cash purchase mergers.[4] As presented in Panel A of Table 1, our sample presents industry and year distributions similar to those used by Gong et al. (2008) and Louis (2004).

Descriptive statistics of the main variables are summarized in Table 2, and all continuous financial variables are winsorized at the 1% and 99% levels.[5] Appendix B provides variable definitions. Descriptive statistics of merger characteristics are reported in Panel A. Except for relative size (*RSize*), our sample's merger characteristics are similar to those in Erickson and Wang (1999) and Louis (2004).

Panel B of Table 2 reports descriptive statistics of firm characteristics, which is consistent with those of Erickson and Wang (1999) or Louis (2004). While the pattern of our sample is comparable with those of the prior literature, merger and firm characteristics are significantly different between cash and stock acquirers. This difference suggests that analyses in our sample and prior literature could have a problem of sample selection. Therefore, we will conduct a propensity score matching in the section of robustness tests.

To verify whether our sample provides a pattern similar to those in previous studies, we follow Gong et al. (2008) and Louis (2004) to estimate the performance-matched DCA and code it as *DCA*1 (see Appendix A for detailed descriptions). Panel A of Table 3 presents the descriptive statistics of *DCA*1. The mean and median of *DCA*1 are −0.001. The left side of Panel B presents the *DCA*1 values of the two samples surrounding the merger announcement. Quarter_{t-1} is the quarter immediately before the merger announcement, and Quarter_{t+1} is the announcement quarter, which covers the announcement date. On average, stock acquirers have higher levels of *DCA*1 than do cash acquirers in Quarter_{t-1}. The time-series pattern shows that stock acquirers also have higher levels of *DCA*1 in Quarter_{t-2} and experience a jump in *DCA*1 from Quarter_{t-2} to Quarter_{t-1}. These results are consistent with those reported by Erickson and Wang (1999), Gong et al. (2008), and Louis (2004).

The traditional measures of earnings management are highly persistent, implying the presence of the omitted variables, such as firm characteristics. Thus, recent studies suggest the use of a time-series adjusted approach (Kothari et al., 2016; Siriviriyakul, 2015). Table 2 shows that merger characteristics differ between stock-for-stock and cash purchase mergers, suggesting that the problem of omitted variables should be dealt with in our research design. We follow Kothari et al. (2016) to estimate the panel-adjusted DCA and code it as *DCA*2 (see Appendix A for detailed descriptions). Panel A of Table 3 presents the descriptive statistics of *DCA*2. The mean value is close to zero because *DCA*2 is residuals. The right side of Panel B presents the *DCA*2 values in the two samples surrounding the merger announcement. Stock acquirers present higher levels of *DCA*2 than do cash acquirers only in Quarter_{t-1}. Stock acquirers experience a jump in *DCA*2 from Quarter_{t-2} to Quarter_{t-1}; however, unlike the results in the left side and Louis (2004), the stock acquirers' *DCA*2 value becomes negative and indifferent to the cash acquirers' in Quarter_{t-2}. This finding suggests the potentiality of uncontrolled persistent firm characteristics in *DCA*1. In summary, although our sample spans a longer period, our sample characteristics are similar to those of the prior literature.

4. Real earnings management in the quarter immediately before the merger announcement

We focus on sales manipulation and overproduction because these means are highly related to current accruals. We follow Roychowdhury (2006) to develop measures of sales manipulation and overproduction. However, these measures are persistent and contain firm-specific factors (Siriviriyakul, 2015). Thus, we follow Kothari et al. (2016) to modify related models and develop the panel-adjusted measures of sales manipulation and overproduction, which are named as *AbCFO* and *AbProd*, respectively (see Appendix A for detailed descriptions).

Panel A of Table 3 presents the values of *AbCFO* and *AbProd* surrounding the stock-for-stock and cash purchase merger announcement. The mean values of *AbCFO* and *AbProd* are close to zero because they are estimated residuals. On the left side

[4] Our sample size of stock-for-stock acquirers is larger than that in Louis (2004) but smaller than that in Gong et al. (2008). The reduction in sample size is primarily due to missing quarterly data from cash flow statements and yearly-changed variables.

[5] We report *p* values based on two-tailed tests throughout this paper.

Table 1
Sample distributions by industry and year.

Panel A: Sample distributions by industry

Two-digit SIC code	Industry	Stock-for-stock		Cash purchase	
		Num.	%	Num.	%
10	Metal mining	11	1.877	3	0.177
13	Oil and gas exploration	28	4.778	35	2.065
17	Construction Special Trade Contractors	3	0.512	4	0.236
20	Food and kindred products	5	0.853	58	3.422
22	Textile mill products	4	0.683	9	0.531
24	Lumber and wood products	3	0.512	5	0.295
26	Paper and allied products	4	0.683	22	1.298
27	Printing and publishing	4	0.683	27	1.593
28	Chemicals	58	9.898	178	10.501
29	Petroleum refining and related industries	3	0.512	17	1.003
33	Primary metals	4	0.683	20	1.180
34	Fabricated metal products	3	0.512	23	1.357
35	Machinery and computer equipment	67	11.433	141	8.319
36	Electronic and electrical equipment	62	10.580	168	9.912
37	Transportation equipment	6	1.024	48	2.832
38	Measuring equipment	47	8.020	169	9.971
39	Miscellaneous manufacturing	7	1.195	19	1.121
42	Motor freight transportation	3	0.512	7	0.413
44	Water transportation	3	0.512	4	0.236
48	Communications	25	4.266	46	2.714
49	Utility services	10	1.706	17	1.003
50	Wholesale – durable	12	2.048	41	2.419
51	Wholesale – nondurable	11	1.877	30	1.770
58	Eating and drinking places	6	1.024	22	1.298
59	Miscellaneous retail	18	3.072	28	1.652
73	Business services	133	22.696	281	16.578
80	Health services	16	2.730	25	1.475
87	Engineering and management services	7	1.195	35	2.065
	Industries with less than three events	23	3.925	213	12.566
	Total	586	100.000	1695	100.000

Panel B: Sample distributions by year

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Stock-for-stock	10	15	27	27	32	40	32	48	58
Cash purchase	47	35	34	56	73	82	68	55	88
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Stock-for-stock	65	55	33	18	19	19	14	18	6
Cash purchase	63	76	51	60	65	64	83	100	125
	2008	2009	2010	2011	2012	2013	Total		
Stock-for-stock	10	14	9	5	5	7	586		
Cash purchase	78	44	82	90	93	83	1695		

of Panel C, stock acquirers have a higher value of *AbCFO* than do cash acquirers in Quarter$_{t-1}$. The time-series pattern indicates that stock acquirers experience a jump in the value of *AbCFO* from Quarter$_{t-2}$ to Quarter$_{t-1}$. In the right side of Panel C summarizes the results of *AbProd*, presenting a pattern similar to that in the left side. These results imply that stock acquirers perform sales manipulation and overproduction in the quarter immediately before the merger announcement.

Table 4 shows Pearson and Spearman correlation matrixes of our variables of interest, using data in Quarter$_{t-1}$. The significant correlation between *Stock* and REM variables (i.e., *AbCFO* and *AbProd*), as well as DCA variables (i.e., *DCA*1 and *DCA*2), are consistent with the findings in Table 3. Although the correlation between *AbCFO* and *DCA*2 is greater than 60%, these two variables are not treated as independent variables simultaneously in our main regression tests. We examine the variance-inflation-factor and find that our results are unlikely to be driven by multicollinearity.

In Table 5, we investigate whether the high DCA of stock acquirers found by previous studies are explained by the measures of REM. Regarding doing REM through sales manipulation, the mediation can be said to occur in the following four conditions: (1) Stock acquirers present a higher value of *AbCFO* than do cash acquirers, (2) stock acquirers present a higher value of *DCA*1 than do cash acquirers in the absence of *AbCFO* (i.e., the total effect of *Stock* on *DCA*1), (3) *AbCFO* has a significant relation to *DCA*1, and (4) the value of *DCA*1 becomes indistinguishable between stock and cash acquirers upon the addition of *AbCFO* to the regression (i.e., an insignificant direct effect of *Stock* on *DCA*1). Conditions (1) and (3) imply that *Stock* is said to have a significant indirect effect on *DCA*1 through the mediator *AbCFO*. The size of the indirect effect is the product of

Table 2
Descriptive statistics of merger and firm characteristics.

	Stock-for-stock	Cash purchase	Mean difference	*p* values
Panel A: Descriptive statistics of merger characteristics				
Private	0.234	0.135	0.099	(0.000)
SameSIC	0.669	0.791	−0.122	(0.000)
SameState	0.294	0.564	−0.270	(0.000)
RSize	0.329	0.559	−0.230	(0.000)
NumStk	0.440	0.073	0.367	(0.000)
ValStk	239.054	108.362	130.692	(0.024)
DealVal	830.670	541.596	289.074	(0.023)
CAR[−1,1]	−0.014	0.021	−0.035	(0.000)
CAR[−2,2]	−0.013	0.022	−0.035	(0.000)
CAR[−3,3]	−0.013	0.023	−0.036	(0.000)
Panel B: Descriptive statistics of firm characteristics				
MktVal	4780.539	7976.405	−3195.866	(0.000)
Assets	3079.399	8466.258	−5386.859	(0.000)
BM	0.362	0.507	−0.145	(0.000)
SaleG	0.482	0.145	0.337	(0.000)
LagROA	−0.006	0.074	−0.080	(0.000)
MktShare	0.015	0.031	−0.016	(0.000)
ZScore	7.715	5.144	2.571	(0.000)
Inst%	0.452	0.585	−0.133	(0.000)
MTR	0.277	0.317	−0.040	(0.000)
BigN	0.917	0.917	0.000	(0.977)
Tenure	8.824	11.513	−2.689	(0.000)
SOX	0.157	0.472	−0.315	(0.000)
LagNOA	0.477	0.541	−0.064	(0.014)
Cycle	65.351	75.683	−10.332	(0.043)

Note: The last two columns report mean differences between stock-for-stock and cash purchase samples and *p* values, respectively. *t* tests are used to test the significance of mean differences. Variable definitions are provided in Appendix B.

Table 3
Acquirers' behavior of earnings management surrounding the merger announcement.

Panel A: Descriptive statistics of DCA1, DCA2, AbCFO and AbProd

	Observations	Mean	Std. Dev.	25%	Median	75%
*DCA*1	6179	−0.001	0.040	−0.018	−0.001	0.016
*DCA*2	6433	−0.000	0.053	−0.019	−0.000	0.020
AbCFO	6433	0.000	0.044	−0.016	0.000	0.017
AbProd	6433	−0.000	0.042	−0.012	−0.001	0.012

Panel B: DCA1 and DCA2 surrounding the merger announcement

	*DCA*1			*DCA*2		
	Stock (1)	Cash (2)	(1)–(2)	Stock (3)	Cash (4)	(3)–(4)
$Quarter_{t-2}$	0.003	−0.001	0.004 (0.065)	−0.001	0.000	−0.002 (0.527)
$Quarter_{t-1}$	0.007	−0.003	0.010 (0.000)	0.007	−0.001	0.008 (0.002)
$Quarter_{t+1}$	0.001	−0.003	0.004 (0.053)	0.001	−0.002	0.003 (0.201)

Panel C: AbCFO and AbProd surrounding the merger announcement

	AbCFO			*AbProd*		
	Stock (1)	Cash (2)	(1)–(2)	Stock (3)	Cash (4)	(3)–(4)
$Quarter_{t-2}$	0.000	−0.001	0.001 (0.660)	0.000	−0.002	0.002 (0.390)
$Quarter_{t-1}$	0.007	−0.001	0.008 (0.000)	0.003	−0.001	0.004 (0.028)
$Quarter_{t+1}$	0.001	0.000	0.001 (0.599)	0.000	0.002	−0.002 (0.421)

Note: $Quarter_{t-1}$ is the quarter immediately before the merger announcement, and $Quarter_{t+1}$ is the announcement quarter. The columns of (1)–(2) and (3)–(4) report mean differences between stock-for-stock and cash purchase samples, followed by *p* values presented in parentheses. *t* tests are used to test the significance of mean differences. *DCA*1 and *DCA*2 are performance-matched and panel-adjusted discretionary current accruals, respectively; and *AbCFO* and *AbProd* are the panel-adjusted measures of sales manipulation and overproduction, respectively.

Table 4
Correlation matrix.

	Stock	*AbCFO*	*AbProd*	*DCA*1	*DCA*2
Stock		**0.078**	0.025	**0.082**	0.032
AbCFO	**0.080**		**0.312**	**0.290**	**0.617**
AbProd	**0.054**	**0.249**		**0.148**	**0.271**
*DCA*1	**0.112**	**0.318**	**0.166**		**0.469**
*DCA*2	**0.072**	**0.605**	**0.233**	**0.558**	

Note: The lower left-hand and upper right-hand portions of this table present Pearson and Spearman correlations, respectively. The bold figures represent that the corresponding correlations are significant at least at the 10% level. Variable definitions are provided in Appendix B.

Table 5
Effect of merger types, sales manipulation, and overproduction on acquirers' discretionary current accruals.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable							
Independent variables	*AbCFO*	*AbProd*	*DCA*1	*DCA*1	*DCA*1	*DCA*2	*DCA*2	*DCA*2
Stock	0.007	0.008	0.006	0.004	0.004	0.003	−0.002	0.001
	(0.022)	(0.010)	(0.050)	(0.186)	(0.123)	(0.350)	(0.558)	(0.811)
AbCFO				0.278			0.725	
				(0.000)			(0.000)	
AbProd					0.154			0.302
					(0.000)			(0.000)
LnAssets	−0.002	−0.000	−0.002	−0.002	−0.002	−0.002	−0.001	−0.002
	(0.036)	(0.918)	(0.003)	(0.010)	(0.003)	(0.013)	(0.149)	(0.012)
BM	−0.002	0.002	−0.000	0.000	−0.001	−0.003	−0.002	−0.004
	(0.332)	(0.528)	(0.913)	(0.850)	(0.822)	(0.287)	(0.550)	(0.231)
SaleG	−0.001	−0.003	0.009	0.009	0.010	−0.001	0.000	0.000
	(0.787)	(0.566)	(0.006)	(0.005)	(0.002)	(0.878)	(0.994)	(0.984)
LagROA	−0.015	0.029	−0.012	−0.008	−0.016	−0.037	−0.027	−0.046
	(0.267)	(0.025)	(0.220)	(0.446)	(0.086)	(0.038)	(0.066)	(0.014)
MktShare	0.010	0.014	−0.002	−0.002	−0.005	−0.001	−0.008	−0.005
	(0.237)	(0.175)	(0.899)	(0.894)	(0.760)	(0.939)	(0.347)	(0.609)
ZScore	−0.000	−0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.114)	(0.610)	(0.437)	(0.150)	(0.382)	(0.932)	(0.130)	(0.832)
Inst%	0.007	0.006	−0.003	−0.005	−0.004	−0.001	−0.006	−0.002
	(0.103)	(0.214)	(0.443)	(0.236)	(0.349)	(0.888)	(0.209)	(0.650)
MTR	−0.003	−0.069	0.038	0.037	0.047	0.038	0.040	0.058
	(0.909)	(0.001)	(0.033)	(0.036)	(0.006)	(0.143)	(0.042)	(0.022)
BigN	0.005	−0.001	0.006	0.004	0.006	0.004	0.000	0.004
	(0.239)	(0.693)	(0.166)	(0.277)	(0.147)	(0.418)	(0.999)	(0.370)
Tenure	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.364)	(0.570)	(0.764)	(0.915)	(0.817)	(0.575)	(0.945)	(0.649)
SOX	−0.009	0.013	−0.011	−0.011	−0.015	−0.021	−0.015	−0.025
	(0.530)	(0.330)	(0.259)	(0.348)	(0.125)	(0.055)	(0.363)	(0.041)
LagNOA	−0.005	0.001	−0.002	−0.001	−0.003	−0.003	0.000	−0.003
	(0.030)	(0.661)	(0.200)	(0.529)	(0.168)	(0.236)	(0.884)	(0.183)
Cycle	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.082)	(0.025)	(0.000)	(0.000)	(0.000)	(0.034)	(0.111)	(0.083)
LnDealVal	0.001	−0.001	0.001	0.001	0.001	0.002	0.002	0.002
	(0.391)	(0.327)	(0.171)	(0.205)	(0.127)	(0.015)	(0.017)	(0.007)
RSize	−0.001	0.001	0.000	0.001	0.000	0.002	0.002	0.001
	(0.838)	(0.591)	(0.826)	(0.665)	(0.836)	(0.588)	(0.371)	(0.651)
LnNumStk	0.001	−0.007	0.000	0.000	0.001	0.003	0.003	0.005
	(0.792)	(0.183)	(0.919)	(0.991)	(0.670)	(0.478)	(0.521)	(0.276)
SameSIC	−0.005	−0.005	−0.006	−0.004	−0.005	−0.008	−0.004	−0.007
	(0.061)	(0.119)	(0.015)	(0.047)	(0.023)	(0.022)	(0.101)	(0.052)
Intercept	0.020	0.010	0.015	0.011	0.015	0.027	0.013	0.024
	(0.208)	(0.509)	(0.209)	(0.391)	(0.203)	(0.035)	(0.457)	(0.079)
Adjusted R^2	0.016	0.018	0.049	0.141	0.074	0.019	0.373	0.075
Indirect effect				0.002	0.001		0.005	0.003
Mediation tests:								
Sobel				(0.020)	(0.008)		(0.016)	(0.004)
Coodman (Aroian)				(0.020)	(0.008)		(0.016)	(0.004)
Coodman				(0.019)	(0.007)		(0.016)	(0.004)
% of mediated total effect				0.353	0.225		1.519	0.755
Observations	2025	2025	1951	1951	1951	2025	2025	2025

Note: The statistics of year and quarter fixed effects are omitted for simplicity. *p* values presented in parentheses are based on standard errors clustered by firms. Variable definitions are provided in Appendix B.

the effect of *Stock* on *AbCFO* and the effect of *AbCFO* on *DCA*1. We use Eqs. (1) and (2) to test conditions (1) and (2), respectively, and use Eq. (3) to test conditions (3) and (4):

$$AbCFO_{it} = \alpha_0 + \alpha_1 Stock_{it} + \beta FirmChar_{it} + \gamma REMCosts_{it} + \delta AEMCosts_{it} + \theta MergerChar_{it} + \mu YEAR + \rho FQ + \varepsilon_{it} \quad (1)$$

$$DCA1_{it} = \alpha_0 + \alpha_1 Stock_{it} + \beta FirmChar_{it} + \gamma REMCosts_{it} + \delta AEMCosts_{it} + \theta MergerChar_{it} + \mu YEAR + \rho FQ + \varepsilon_{it} \quad (2)$$

$$DCA1_{it} = \alpha_0 + \alpha_1 Stock_{it} + \alpha_2 AbCFO_{it} + \beta FirmChar_{it} + \gamma REMCosts_{it} + \delta AEMCosts_{it} + \theta MergerChar_{it} + \mu YEAR + \rho FQ + \varepsilon_{it} \quad (3)$$

where *FirmChar* is the set of firm characteristics variables; *REMCosts* is the set of variables measuring the costs of REM; *AEMCosts* is the set of variables measuring the costs of AEM; *MergerChar* is the set of merger characteristics variables; *YEAR* is the set of fiscal year fixed effects; *FQ* is the set of fiscal quarter fixed effects, and the definitions of the other variables are provided in Appendix B.

Following Chan et al. (2015) and Zang (2012), we control for firm characteristics, including firm size (*LnAssets*), book-to-market ratio (*BM*), yearly growth in net sales (*SaleG*), and lagged return on assets (*LagROA*). We also include the costs associated with the substitution between REM and AEM. The costs associated with REM include market leadership (*MktShare*), the Z-score in Altman (1968) (*ZScore*), institutional ownership (*Inst%*), and the marginal tax rate (*MTR*). The costs associated with AEM contain audit firm size (*BigN*), auditor tenure (*Tenure*), the passage of the Sarbanes–Oxley Act (*SOX*), lagged net operating assets (*LagNOA*), and operating cycle (*Cycle*). Based on the different characteristics of the two types of mergers in Table 2, we also incorporate merger characteristics (i.e., *LnDealVal*, *RSize*, *LnNumStk*, and *SameSIC*) in Eqs. (1), (2), and (3).

Eqs. (1)–(3) are estimated using data in Quarter$_{t-1}$. The results are presented in Columns (1), (3), and (4) of Table 5. In Columns (1) and (3), the positive and significant coefficients of *Stock* on *AbCFO* and *DCA*1 support conditions (1) and (2), respectively. Column (4) presents a positive and statistically significant relation between *DCA*1 and *AbCFO*, supporting condition (3). Column (4) also shows that the coefficient of *Stock* on *DCA*1 decreases to an insignificant level after controlling for *AbCFO*. We perform a seemingly unrelated estimation and find that the total effect of *Stock* on *DCA*1 is 0.006 and significant, and the direct effect of *Stock* on *DCA*1 becomes 0.004 and insignificant. This result supports condition (4) and implies that approximately 35.3% of the effect of *Stock* on *DCA*1 is mediated by *AbCFO*.[6]

The coefficient of *Stock* in Column (1) is 0.007, and the coefficient of *AbCFO* in Column (4) is 0.278. Therefore, the indirect effect of *Stock* on *DCA*1 through the mediator *AbCFO* is 0.002 (i.e., 0.007 × 0.278). Sobel-Goodman mediation tests in Column (4) further show that the indirect effect is statistically significant. Our empirical results suggest that using stock-for-stock mergers has a significant indirect effect on higher DCA through the mediator of sales manipulation.

Regarding doing REM through overproduction, we replace *AbCFO* in Eqs. (1) and (3) with *AbProd* to test four conditions. The related results are summarized in Columns (2) and (5) and present a pattern similar to that of *AbCFO*. Approximately 22.5% of the effect of *Stock* on *DCA*1 is significantly mediated by *AbProd*, and Sobel-Goodman mediation tests in Column (5) present a significant indirect effect of *Stock* on *DCA*1 through the mediator of *AbProd*. Thus, our hypothesis is supported.

Empirical results where *DCA*2 is the dependent variable are shown in Columns (6), (7), and (8). Approximately 151.9% and 75.5% of the effect of using stock-for-stock mergers on high DCA is significantly mediated by sales manipulation (*AbCFO*) and overproduction (*AbProd*), respectively. Sobel-Goodman mediation tests in Columns (7) and (8) also show significant indirect effects of *Stock* on *DCA*2 through the mediator of *AbCFO* and *AbProd*, respectively. Of interest, Column (6) presents an insignificant total effect of *Stock* on *DCA*2. While Baron and Kenny (1986) suggest that a significant total effect is a prerequisite of proving the existence of a mediation effect, Shrout and Bolger (2002) and Zhao et al. (2010) suggest that there need not be a significant total effect to be mediated. According to Zhao et al. (2010), our theoretical inference and empirical results indicate an indirect-only mediation of REM. That is, the mediated effect of REM exists, but no direct effect of using stock-for-stock mergers on DCA. Therefore, the total effect, which equals the sum of the indirect and direct effects, could be insignificant.

In summary, we find that stock acquirers perform sales manipulation and overproduction in the quarter immediately before the merger announcement, and thus, the high DCA of stock acquirers are driven by sales manipulation and overproduction.[7]

5. Robustness tests

In this section, we conduct four tests to show that our findings are robust. First, we examine the accruals feature of sales manipulation and overproduction. Untabulated results show a lower level of CFO given the levels of net sales (i.e., a higher level of *AbCFO*) in Quarter$_{t-1}$, which can be derived from price discounts and lenient credit terms. However, only lenient credit terms are related to current accruals. Thus, we examine the change in accounts receivable surrounding the merger

[6] The total and indirect effects of *Stock* on *DCA*1 are 0.005549 and 0.003592, respectively. Therefore, 35.3% is the difference between 0.005549 and 0.003592, divided by 0.005549.

[7] The trade-off between REM and AEM is beyond the scope of this paper, and there is a relative lack of theory that managers adjust the amount of REM after AEM. Despite that, in the untabulated results, we control the effect of DCA on the REM in Columns (1) and (2) of Table 5 by incorporating *DCA*1 or *DCA*2 in regressions. The results show that unlike the relation between *Stock* and *DCA*1 or *DCA*2 that shrinks after controlling for *AbCFO* or *AbProd*, the relation between *Stock* and *AbCFO* or *AbProd* remains positive and statistically significant after controlling for *DCA*1 or *DCA*2.

announcement. Our untabulated results show that stock acquirers have more days of sales outstanding in Quarter$_{t-1}$ than do cash acquirers, which is not derived from underestimating the allowance for doubtful receivables. We further find that stock acquirers' change in the gross margin is positive and greater than that of cash acquirers. Thus, our evidence indicates that stock acquirers do not use price cutting to accelerate their sales in Quarter$_{t-1}$.

Our untabulated results also show an increase in the gross margin, which implies that stock acquirers overproduce to lower their COGS, which echoes our findings in Table 3. We further find growing days in inventories, suggesting that stock acquirers increase production to report lower allocated fixed costs in COGS and higher overproduced inventories. Moreover, we find that current accruals other than accounts receivable and inventories do not exhibit a significant difference between stock and cash acquirers prior to the merge. This finding suggests that stock acquirers do little AEM in current accruals, which are unrelated to sales manipulation and overproduction.

Second, we provide further empirical evidence that higher DCA of stock acquirers are a phenomenon or manifestation of sales manipulation and overproduction. Specifically, we divide DCA documented in prior studies into two components explained and unexplained by real earnings management. We regress *DCA*1 on *AbCFO*, *AbProd*, fiscal quarter fixed effects, and firm fixed effects. The explained component, *xb*(*DCA*1), is the fitted value of *AbCFO* and *AbProd*, while the unexplained component, *e*(*DCA*1), is the overall error component. Then, we regress *xb*(*DCA*1) or *e*(*DCA*1) on *Stock*, *FirmChar*, *REMCosts*, *AEMCosts*, year fixed effects, and quarter fixed effects.

Related results are summarized in Columns (1) and (2) of Table 6. Column (1) presents that, relative to cash acquirers, stock acquirers have higher *DCA*1 explained by *AbCFO* and *AbProd*. However, Column (2) presents that *DCA*1 unexplained by *AbCFO* and *AbProd* for stock acquirers is indistinguishable from that of cash acquirers. We also divide *DCA*2 into *xb* (*DCA*2) and *e*(*DCA*2). Related results are shown in Columns (3) and (4), and have a similar pattern. These findings suggest that higher DCA of stock acquirers are driven by the accruals feature of REM.

Third, our main results in Table 5 may suffer from functional form misspecification due to significant characteristics difference between cash and stock acquirers, reported in Table 2. Although we have controlled for firm and merger characteristics in Eqs. (1), (2), and (3), according to Rubin (1979) and Shipman et al. (2017), these equations may insufficiently adjust for firm and merger characteristics if the relation between earnings management variables and controlled characteristics is misspecified.

We use the propensity score matching approach and revisit tests in Table 5. Specifically, we conduct a probit regression, which regresses *Stock* on *FirmChar*, *REMCosts*, and *AEMCosts*. Then, we calculate propensity scores, and we match each stock acquirer to the cash acquirer with the closest propensity score. Panel A of Table 7 presents characteristic differences between 360 matched pairs. Except for *ZScore*, *LnNumStk*, and *SameSIC*, the mean differences between stock and cash acquirers are all insignificant. Overall, there is no significant difference in propensity scores (*PropScore*) between stock acquirers and their matched cash acquirers, suggesting that these pairs are matched appropriately.[8]

We use these matched pairs to reexamine our main tests in Table 5. The related results are summarized in Panel B of Table 7. Although Column (5) demonstrates that the propensity score matching analysis presents an insignificant relationship between *AbProd* and *DCA*1, the indirect effect of *Stock* on *DCA*1 through *AbProd* is marginally significant. Generally, our hypothesis is supported in the setting of propensity score matching.

Finally, we replace cash acquirers with an alternative matched group. Although the setting of comparison between stock and cash acquirers allows us to provide empirical results comparable with those in prior studies (Erickson and Wang, 1999; Louis, 2004), Table 2 indicates a potential problem of sample selection. Therefore, we employ non-merger firms as an alternative control group, which is also adopted in the robustness test of Erickson and Wang (1999). We follow Zang (2012) to define firms suspected of managing earnings as those just meeting analyst forecasts, prior earnings, and zero earnings. We create an indicator (*StockNon*), which equals one if a firm engaged in a stock-for-stock merger, and zero if the firm is neither a merger firm nor a firm suspected of managing earnings. We conduct a probit regression, which regresses *StockNon* on *FirmChar*, *REMCosts*, and *AEMCosts*. Then, we calculate propensity scores and match each stock acquirer to the non-merger firm with the closest propensity score. Untabulated results show that REM variables still mediate the relation between *StockNon* and DCA at a significant level. Our hypothesis is supported in the setting of the matched non-merger group.

6. Additional tests

In this section, we investigate the association between REM and post-merger performance to confirm our hypotheses and previous findings. Previous studies indicate that REM has a substantial impact on a firm's subsequent performance (Alhadab et al., 2014; Bhojraj et al., 2009; Cohen and Zarowin, 2010; Kothari et al., 2016). While Gong et al. (2008) and Louis (2004) partly attribute long-term underperformance after stock-for-stock mergers to the reversal effects and litigation costs associated with pre-merger DCA, they do not consider the value impairment driven by distorted business activities.

To investigate the market performance of firms after they have undergone a merger, we follow Barber and Lyon (1997) to estimate the one- or two-year adjusted stock return starting from three days after the merger announcement (i.e., *AbRet*1*y* or

[8] We rerun the probit model using the matched 360 matched pairs. Untabulated results show that, except for the coefficient of *ZScore*, none of the coefficients on the independent variables are statistically significant. The coefficient of *ZScore* is significant at the 10% level (p-value = 0.078). Panel A of Table 7 also shows that the means of *ZScore* are 6.753 and 5.516 in stock and cash acquirers, respectively. These values are greater than the mean of all Compustat firms in our sample period, 3.822. Therefore, stock acquirers and matched cash acquirers have good financial health although their *ZScore* is marginally different.

Table 6
Robustness tests: Discretionary current accruals explained and unexplained by real earnings management.

	(1)	(2)	(3)	(4)
	Dependent variable			
Independent variables	*xb*(*DCA*1)	*e*(*DCA*1)	*xb*(*DCA*2)	*e*(*DCA*2)
Stock	0.002	−0.001	0.006	−0.002
	(0.033)	(0.363)	(0.010)	(0.104)
Adjusted R^2	0.014	−0.013	0.017	−0.006
Observations	1951	1951	2025	2025

Note: The statistics of intercept, control variables, year, and quarter fixed effects are omitted for simplicity. *p* values presented in parentheses are based on standard errors clustered by firms. Variable definitions are provided in Appendix B.

Table 7
Robustness tests: matching with cash acquirers.

Panel A: Merger determinants by stock and matched cash acquirers

	Stock-for-stock	Cash purchase	Mean difference	*p* values
LnAssets	6.170	6.278	−0.108	(0.472)
BM	0.393	0.431	−0.039	(0.249)
SaleG	0.357	0.380	−0.023	(0.471)
LagROA	0.033	0.014	0.019	(0.180)
MktShare	0.017	0.017	0.000	(0.900)
ZScore	6.753	5.516	1.237	(0.024)
Inst%	0.475	0.476	−0.001	(0.977)
MTR	0.287	0.290	−0.002	(0.712)
BigN	0.911	0.886	0.025	(0.265)
Tenure	9.639	9.747	−0.108	(0.852)
SOX	0.189	0.203	−0.014	(0.588)
LagNOA	0.483	0.522	−0.039	(0.284)
Cycle	69.026	72.564	−3.538	(0.615)
LnDealVal	4.544	4.531	0.013	(0.930)
RSize	0.379	0.390	−0.011	(0.756)
LnNumStk	0.141	0.190	−0.049	(0.052)
SameSIC	0.697	0.636	0.061	(0.071)
PropScore	0.472	0.472	0.000	(0.629)

Panel B: Regression results of stock acquirers and matched cash acquirers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable							
Independent variables	*AbCFO*	*AbProd*	*DCA*1	*DCA*1	*DCA*1	*DCA*2	*DCA*2	*DCA*2
Stock	0.018	0.011	0.008	0.003	0.008	0.010	−0.001	0.008
	(0.000)	(0.027)	(0.073)	(0.434)	(0.104)	(0.083)	(0.789)	(0.176)
AbCFO				0.294			0.647	
				(0.000)			(0.000)	
AbProd					0.067			0.200
					(0.239)			(0.024)
Adjusted R^2	0.044	0.082	0.049	0.133	0.053	0.068	0.344	0.100
Indirect effect				0.005	0.001		0.012	0.002
Mediation tests:								
Sobel				(0.000)	(0.103)		(0.000)	(0.016)
Coodman (Aroian)				(0.000)	(0.117)		(0.000)	(0.017)
Coodman				(0.000)	(0.088)		(0.000)	(0.014)
% of mediated total effect				0.636	0.091		1.115	0.206
Observations	720	720	700	700	700	720	720	720

Note: The statistics of intercept, control variables, year, and quarter fixed effects are omitted for simplicity. *p* values presented in parentheses are based on standard errors clustered by firms. Variable definitions are provided in Appendix B.

AbRet2y, respectively). An adjusted stock return consists of the difference between the acquirer's raw buy-and-hold stock return and the matching firm's raw buy-and-hold stock return. We choose the matching firm based on the market value of the common equity and the book-to-market ratio in Quarter$_{t-1}$. As shown in Panel A of Table 8, the means and medians

Table 8
Additional tests: Effects of discretionary current accruals, sales manipulation, and overproduction on stock acquirers' subsequent market and operating performance.

Panel A: Descriptive statistics of subsequent market and operating performance

	Observations	Mean	Std. Dev.	25%	Median	75%
AbRet1y	529	−0.080	0.979	−0.423	−0.100	0.280
AbRet2y	479	−0.119	1.274	−0.591	−0.174	0.328
AbΔROA1y	495	−0.040	0.469	−0.088	−0.007	0.044
AbΔROA2y	415	−0.015	0.241	−0.075	−0.010	0.061

Panel B: Regression results of subsequent market performance

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable					
Independent variables	*AbRet1y*	*AbRet1y*	*AbRet1y*	*AbRet2y*	*AbRet2y*	*AbRet2y*
DCA2	−1.669	−1.002	−1.339	−1.429	−0.083	−0.776
	(0.008)	(0.131)	(0.031)	(0.063)	(0.922)	(0.349)
AbCFO		−1.621			−3.133	
		(0.035)			(0.028)	
AbProd			−1.119			−2.337
			(0.202)			(0.141)
BM	−0.113	−0.118	−0.108	−0.076	−0.090	−0.071
	(0.534)	(0.517)	(0.543)	(0.620)	(0.556)	(0.638)
RSize	−0.041	−0.041	−0.038	0.015	0.019	0.021
	(0.675)	(0.682)	(0.699)	(0.877)	(0.847)	(0.830)
Private	−0.069	−0.064	−0.070	0.018	0.035	0.014
	(0.493)	(0.521)	(0.482)	(0.920)	(0.841)	(0.940)
Pool	0.005	0.004	0.007	0.077	0.089	0.085
	(0.958)	(0.962)	(0.938)	(0.544)	(0.487)	(0.502)
SameSIC	0.092	0.089	0.088	0.244	0.235	0.234
	(0.285)	(0.298)	(0.313)	(0.048)	(0.055)	(0.057)
CEOSH	0.477	0.369	0.407	−3.814	−3.998	−3.992
	(0.716)	(0.777)	(0.762)	(0.180)	(0.158)	(0.156)
Intercept	−0.065	−0.054	−0.063	−0.265	−0.248	−0.259
	(0.514)	(0.588)	(0.529)	(0.049)	(0.063)	(0.054)
Adjusted R^2	0.005	0.008	0.007	0.009	0.018	0.016
Observations	529	529	529	479	479	479

Panel C: Regression results of subsequent operating performance

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable					
Independent variables	*AbΔROA1y*	*AbΔROA1y*	*AbΔROA1y*	*AbΔROA2y*	*AbΔROA2y*	*AbΔROA2y*
DCA2	−0.296	0.867	−0.103	−0.375	−0.103	−0.133
	(0.508)	(0.255)	(0.833)	(0.019)	(0.603)	(0.462)
AbCFO		−2.601			−0.585	
		(0.008)			(0.088)	
AbProd			−0.718			−0.748
			(0.020)			(0.004)
BM	0.035	0.033	0.043	−0.033	−0.032	−0.025
	(0.610)	(0.596)	(0.529)	(0.077)	(0.079)	(0.154)
RSize	−0.128	−0.116	−0.127	0.018	0.019	0.019
	(0.081)	(0.094)	(0.078)	(0.464)	(0.417)	(0.426)
Private	−0.097	−0.092	−0.094	−0.065	−0.066	−0.063
	(0.108)	(0.115)	(0.118)	(0.084)	(0.081)	(0.095)
Pool	0.035	0.035	0.034	0.003	0.003	0.003
	(0.380)	(0.380)	(0.391)	(0.896)	(0.895)	(0.916)
SameSIC	0.003	−0.006	−0.001	0.020	0.019	0.016
	(0.946)	(0.892)	(0.973)	(0.420)	(0.427)	(0.505)
CEOSH	0.029	−0.220	0.089	−0.503	−0.546	−0.472
	(0.934)	(0.640)	(0.814)	(0.209)	(0.200)	(0.293)
Intercept	−0.004	0.014	−0.001	−0.005	−0.002	−0.004
	(0.928)	(0.734)	(0.977)	(0.850)	(0.938)	(0.879)
Adjusted R^2	0.009	0.060	0.013	0.015	0.022	0.038
Observations	495	495	495	415	415	415

Note: The sample consists only of stock-for-stock mergers. The statistics of year and quarter fixed effects are omitted for simplicity. *p* values presented in parentheses are based on standard errors clustered by firms. Variable definitions are provided in Appendix B.

of *AbRet*1*y* and *AbRet*2*y* are negative and different from zero significantly, which is consistent with the findings in Gong et al. (2008) and Louis (2004).[9]

We refer to Gong et al. (2008) to formulate Eqs. (4) and (5) to test the association between earnings management and the subsequent market performance of the stock acquirers:

$$AbRet_{it} = \beta_0 + \beta_1 DCA2_{it} + \beta_2 AbCFO_{it} + \beta_3 BM_{it} + \beta_4 RSize_{it} + \beta_5 Private_{it} + \beta_6 Pool_{it} + \beta_7 SameSIC_{it} + \beta_8 CEOSH_{it} + \varepsilon_{it} \quad (4)$$

$$AbRet_{it} = \beta_0 + \beta_1 DCA2_{it} + \beta_2 AbProd_{it} + \beta_3 BM_{it} + \beta_4 RSize_{it} + \beta_5 Private_{it} + \beta_6 Pool_{it} + \beta_7 SameSIC_{it} + \beta_8 CEOSH_{it} + \varepsilon_{it} \quad (5)$$

where *AbRet* is *AbRet*1*y* or *AbRet*2*y*, and the definitions of the other variables are provided in Appendix B.

The results are summarized in Panel B of Table 8. Without measures of REM in the model, Column (1) shows a negative and statistically significant association between *AdjRet*1*y* and *DCA*2, which is consistent with the findings in Louis (2004). Column (2) presents that sales manipulation impairs the post-merger market performance of stock acquirers. After incorporating *AbCFO*, the coefficient of *DCA*2 becomes statistically insignificant, confirming the mediating effect of sales manipulation on DCA. Our result is also economically significant. For example, the coefficient of *AbCFO* is −1.621 in Column (2), and the standard deviation of *AbCFO* is 0.051 (untabulated). This implies that a one-standard-deviation increase of *AbCFO* is associated with −8.3% stock return in one year after the stock-for-stock merger. This value is greater than the mean of *AbRet*1*y*, −8.0%. We find little evidence that overproduction influences the post-merger performance.

We also test stock acquirers' operating performance in the post-merger period. Specifically, we follow Barber and Lyon (1997) and Cohen and Zarowin (2010) to estimate one-year and two-year changes in adjusted returns on assets after the merger announcement (i.e., *Ab*Δ*ROA*1*y* or *Ab*Δ*ROA*2*y*, respectively). An adjusted return on assets consists of the difference between an acquirer's yearly return on assets and a matching firm's yearly return on assets. We choose the matching firm based on total assets in $Quarter_{t-1}$. From this set of firms, we match the acquirer with the non-merger firm that has the closest return on assets in $Quarter_{t-1}$. Panel A of Table 8 shows that the mean and median of *Ab*Δ*ROA*1*y* are negative and significantly different from zero.

We replace *AbRet*1*y* or *AbRet*1*y* in Eqs. (4) and (5) with *Ab*Δ*ROA*1*y* or *Ab*Δ*ROA*2*y*, respectively, to test the association between earnings management and the subsequent operating performance of the stock acquirers. The related results are summarized in Panel C of Table 8. Columns (2) and (3) present that REM (i.e., sales manipulation and overproduction), rather than upward current accruals, impair the post-merger operating performance of stock acquirers. The coefficient of *AbCFO* is −2.601 in Column (2), and therefore, a one-standard-deviation increase is associated with an earnings decline of 13.3 cents per dollar of assets in one year after the stock-for-stock merger. The coefficient of *AbProd* is −0.718 in Column (3), and the standard deviation of *AbProd* is 0.056 (untabulated). Thus, a one-standard-deviation increase is associated with an earnings decline of 4.0 cents per dollar of assets in one year after the stock-for-stock merger.

In summary, we find that the subsequent underperformance of stock-for-stock mergers is related to the effect of REM. Our findings also suggest that the focus on examining the implications of discretionary accruals appears incomplete if REM is not also considered.

7. Conclusion

Our study helps to complement the findings in prior studies that test for upward current accruals before the stock-for-stock merger announcement. Previous studies suggest that acquirers manage their current accruals upward in the quarter immediately before the stock-for-stock merger announcement and then attribute their subsequent underperformance to the reversal effects or litigation costs of the upward current accruals (Erickson and Wang, 1999; Gong et al., 2008; Louis, 2004). However, a corporate merger signifies an announcement that attracts market scrutiny, which induces stock acquirers to figure out other ways to manage their earnings. We revisit stock acquirers' earnings management behavior and their subsequent performance from the perspective of REM. Our results indicate that stock acquirers exhibit indistinguishable levels of DCA from those of cash acquirers after controlling for the effect of REM. In extensive tests, we find that stock acquirers that accelerate their credit sales experience subsequent underperformance; however, this underperformance is not associated with DCA.

Knowing techniques of earnings management is essential because these techniques can provide the appearance of a financial turnaround. Thus, investors in stock acquirers should be cautious when interpreting the meaning of earnings because REM may result in the overvaluation of firm equity, to say nothing of a consequence of significant harm of firm value in the long-run. Besides, our paper provides insights for the auditors. Even though REM likely does not violate GAAP or cause material misstatements, it could cause auditors to experience discomfort because REM often is used to mislead investors (Roychowdhury, 2006). Given the importance, pervasiveness, and related challenges of REM, we expect that the findings of this paper can motivate future research to investigate auditors' responses to REM, that is, how auditors deal with the effect of upward current accruals created by REM. Furthermore, this paper is of beneficial to audit committees. REM can be min-

[9] Consistent with Cui and Leung (2020) and Louis (2004), our untabulated results also show that the subsequent market performance of stock acquirers is significant lower than that of cash acquirers.

imized by the existence of a competent audit committee. However, things are not as easy as they appear; the audit committee should balance the benefits and costs brought by REM, which is also of interest to future researchers.

Conflict of interest

None.

Acknowledgements

The authors are grateful for the comments of Sheng-Syan Chen, Ting-Kai Chou, Pinghsun Huang, Shengmin Hung, Chi-Hua Li, Shaw Warm Too, and workshop participants at the 2015 Accounting Theory and Practice Conference in Taiwan and at the Accounting and Finance Seminar of National Cheng Kung University. This work was supported by the Ministry of Science and Technology, Taiwan, R.O.C. [103-2410-H-029-020-]. Pan acknowledges financial support from MOST 107-2410-H-007-101-MY2, MOST 108-3017-F-002-003, and the Center for Research in Econometric Theory and Applications (Grant no. 108L900202) from The Featured Areas Research Center Program within the framework of the Higher Education Sprout Project by the Ministry of Education (MOE) in Taiwan.

Appendix A. Sample selection, discretionary current accruals, and real earnings management measures

Our sample includes merger transactions, which satisfy the following criteria. These criteria are highly similar to those in Gong et al. (2008) and Louis (2004).

(1) The merger was successfully completed, and the completion date is available in the SDC database.
(2) The transaction is either a pure stock-for-stock or a pure cash purchase merger.
(3) The target is coded in the SDC database as either a publicly traded or a privately held firm.
(4) The total assets of the target and the deal value of the merger are reported in the SDC database.
(5) The acquirer is a non-financial firm.
(6) The quarterly earnings announcement date for the acquirer is available in the Compustat database.
(7) The acquirer has the necessary quarterly data on Compustat to compute and estimate variables that take place within 91 days, starting 89 days before the merger announcement.
(8) The acquirer had no stock-for-stock merger in the previous quarter.
(9) The data required to compute cumulative adjusted stock returns over days centered on the merger announcement are available from the Center for Research in Security Prices (CRSP).
(10) The data required to compute the empirical variables are available on Compustat.

To provide comparable results, we follow Gong et al. (2008) and Louis (2004) to estimate the performance-matched discretionary current accruals. Using all firms that have the necessary data on Compustat, for each calendar quarter and two-digit SIC (Standard Industrial Classification) code, the following equation is estimated using at least 20 observations for each industry-quarter:

$$CACC_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \alpha_2(CACC_{it-1}/A_{it-1}) + \alpha_3((\Delta REV_{it} - \Delta REC_{it})/A_{it-1}) + \delta FQ + \varepsilon_{it} \quad \text{(A1)}$$

where *CACC* is the quarterly change in current assets minus the quarterly change in current liabilities minus the quarterly change in cash and short-term investments plus the quarterly change in debt in current liabilities; *A* is total assets; ΔREV is the quarterly change in net sales; ΔREC is the quarterly change in accounts receivable; *FQ* is the set of fiscal quarter fixed effects.

Discretionary current accruals are measured by the residual of Eq. (A1). For each industry-quarter, the observations are divided into five portfolios by sorting the return on assets from the same quarter of the previous year. Then, we compute the performance-matched discretionary current accruals (*DCA*1) as the discretionary current accruals minus the average discretionary current accruals in the respective performance-matched portfolio.

Regarding panel-adjusted discretionary current accruals, we follow Kothari et al. (2016) to control for the time- and firm-specific effects and modify Eq. (A1) into the following:

$$AdjCACC_{it} = \alpha_0 + \alpha_1 AdjA_{it} + \alpha_2 AdjCACC_{it-1} + \alpha_3 Adj\Delta REV\Delta REC_{it} + \alpha_4 AdjNI_{it} + \tau_t + u_i + \varepsilon_{it} \quad \text{(A2)}$$

where $AdjCACC_{it}$ is the difference between $CACC_{it}/A_{it-1}$ and the quarterly mean;$AdjA_{it}$ is the difference between $1/A_{it-1}$ and the quarterly mean;$AdjCACC_{it-1}$ is the difference between $CACC_{it-1}/A_{it-1}$ and the quarterly mean;$Adj\Delta REV\Delta REC_{it}$ is the difference between $(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}$ and the quarterly mean;$AdjNI_{it}$ is the difference between NI_{it}/A_{it-1} and the quarterly mean; *NI* is net income. In addition, for each variable in Eq. (A2), we subtract the variable's value in the same quarter of the previous year. The other variables are those defined for Eq. (A1).

We estimate Eq. (A2) as a single panel regression with fiscal quarter and firm fixed effects. The overall error component (ε_{it}) in Eq. (A2) is the panel-adjusted discretionary current accruals, *DCA*2.

We also follow Kothari et al. (2016) to estimate the panel-adjusted measures of sales manipulation and overproduction.

$$AdjCFO_{it} = \alpha_0 + \alpha_1 AdjA_{it} + \alpha_2 AdjREV_{it} + \alpha_3 Adj\Delta REV_{it} + \tau_t + u_i + \varepsilon_{it} \quad (A3)$$

$$AdjProd_{it} = \alpha_0 + \alpha_1 AdjA_{it} + \alpha_2 AdjREV_{it} + \alpha_3 Adj\Delta REV_{it} + \alpha_4 Adj\Delta REV_{it-1} + \tau_t + u_i + \varepsilon_{it} \quad (A4)$$

where $AdjCFO_{it}$ is the difference between CFO_{it}/A_{it-1} and the quarterly mean; *CFO* is cash flows from operating activities; $AdjREV_{it}$ is the difference between REV_{it}/A_{it-1} and the quarterly mean;$Adj\Delta REV_{it}$ is the difference between $\Delta REV_{it}/A_{it-1}$ and the quarterly mean; $AdjProd_{it}$ is the difference between $Prod_{it}/A_{it-1}$ and the quarterly mean; *Prod* is COGS plus the quarterly change in inventory; and $Adj\Delta REV_{it-1}$ is the difference between $\Delta REV_{it-1}/A_{it-1}$ and the quarterly mean. In addition, for each variable in Eqs. (A3) and (A4), we subtract its value in the same quarter of the previous year. The other variables are those defined for Eq. (A1).

The overall error components (ε_{it}) of Eqs. (A3) and (A4) are estimated using single panel regressions with fiscal quarter and firm fixed effects. If firms engage in sales manipulation, they will have lower current-period CFO than what is normal, given the sales level. Thus, the residual of Eq. (A3) is multiplied by negative one. We code the panel-adjusted measures of sales manipulation and overproduction as *AbCFO* and *AbProd*, respectively.

Appendix B. Variable definitions.

Variable		Definition
AbCFO	=	the panel-adjusted measure of sales manipulation
AbProd	=	the panel-adjusted measure of overproduction
*AbRet*1*y*	=	one-year stock returns after the merger announcement, adjusted for that of the size and book-to-market-ratio matched non-merger firm
*AbRet*2*y*	=	two-year stock returns after the merger announcement, adjusted for that of the size and book-to-market-ratio matched non-merger firm
*Ab*Δ*ROA*1*y*	=	one-year changes in return on assets after the merger announcement, adjusted for that of the size and performance matched non-merger firm
*Ab*Δ*ROA*2*y*	=	two-year changes in return on assets after the merger announcement, adjusted for that of the size and performance matched non-merger firm
Assets	=	the acquirer's total assets ($ million)
BigN	=	one if a firm is audited by a big audit firm, and zero otherwise
BM	=	book-to-market ratio
CAR[−1,1]	=	the acquirer's market-adjusted stock returns over the three days centered on the merger announcement
CAR[−2,2]	=	the acquirer's market-adjusted stock returns over the five days centered on the merger announcement
CAR[−3,3]	=	the acquirer's market-adjusted stock returns over the seven days centered on the merger announcement
CEOSH	=	the proportion of shares held by the chief executive officer
Cycle	=	days in inventories plus days in receivables less days in payables
*DCA*1	=	performance-matched discretionary current accruals
*DCA*2	=	panel-adjusted discretionary current accruals
DealVal	=	the merger deal value ($ million)
e(*DCA*1)	=	overall error component after regressing *DCA*1 on *AbCFO* and *AbProd*
e(*DCA*2)	=	overall error component after regressing *DCA*2 on *AbCFO* and *AbProd*
Inst%	=	the proportion of shares held by institutional investors
LagNOA	=	one if net operating assets at the beginning of the fiscal quarter divided by yearly net sales in the previous quarter is above the industry-quarter median, and zero otherwise
LagROA	=	yearly return on assets in the previous quarter
LnAssets	=	the natural logarithm of *Assets*
LnDealVal	=	the natural logarithm of *DealVal*
LnNumStk	=	the natural logarithm of *NumStk*
MktShare	=	net sales divided by the industry-quarter total of net sales
MktVal	=	the acquirer's market value of common equity ($ million)
MTR	=	the marginal tax rate
NumStk	=	the number of stock-for-stock mergers that the acquirer executed over the previous two years
Pool	=	one if the merger is accounted for by the pooling-of-interest method, and zero if it is accounted for by the purchase method

Variable definitions. (*continued*)

Variable		Definition
Private	=	one if the target is a privately held company, and zero otherwise
PropScore	=	the propensity score of doing stock-for-stock mergers
RSize	=	the ratio of the target's total assets to the acquirer's total assets
SaleG	=	yearly growth in net sales
SameSIC	=	one if the target and the acquirer operate in the same two-digit SIC industry, and zero otherwise
SameState	=	one if the target and the acquirer are located in the same state, and zero otherwise
SOX	=	one if a fiscal year is after 2003, and zero otherwise
Stock	=	one if a firm engaged in a stock-for-stock merger, and zero otherwise
Tenure	=	one if a firm's auditor tenure is above the yearly median, and zero otherwise
ValStk	=	the total deal value of stock-for-stock mergers that the acquirer executed over the previous two years ($ million)
xb(*DCA*1)	=	the fitted value after regressing *DCA*1 on *AbCFO* and *AbProd*
xb(*DCA*2)	=	the fitted value after regressing *DCA*2 on *AbCFO* and *AbProd*
ZScore	=	the Z-score in Altman (1968)

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