Accrual-Based Earnings Management and the COVID-19 Pandemic

Pei-Hui Hsu
California State University East Bay

Ching-Lih Jan
California State University East Bay

In this study, we document the accrual-based earnings management of Old Economy firms and New Economy firms (firms in the technology industry) and loss-making firms (firms with negative earnings in the pre-pandemic year, 2019) and profit firms in each economy, respectively, before, during, and in the recovery year of the COVID-19 pandemic. Using both univariate and difference-in-difference regression analyses, we find that old and new economy firms adopt different accrual-based earnings management, and Old Economy Loss firms changed their accrual-based earnings management the most during and in the recovery of the pandemic. During the 2020 pandemic, Old Economy Loss reported the lowest amount of accrual-based discretionary accruals. This suggests that Old Economy Loss firms are engaged in the most conservative approach to reporting their earnings, consistent with the big bath proposition. In the recovery year of the pandemic, 2021, we find that accrual-based earnings management reversed, with the old economy losing firms reporting the highest amounts of discretionary accruals. However, we do not find that the explanatory power of earnings on the variance of stock prices for the old economy loss firms is affected by their discretionary change in accounting accruals.

Keywords: earnings management, accruals, COVID-19, pandemic

INTRODUCTION

The Financial Accounting Standards Board's conceptual framework (Financial Accounting Standards Board, 2010) states that the primary objective of financial reporting is to provide useful financial information to external capital providers (investors and creditors) in making their decisions. Many accounting studies have documented an association between share price (reflecting investors' decisions) and items reported in financial statements, such as earnings, equity book value, the combination of these two primary accounting summary measures, and the addition of financial items, such as research and development (R&D) and advertising expenses (related to intangible assets), capital expenditure, and revenue growth (related to growth opportunities). However, this value relevance argument not only implicitly assumes that financial reporting is relevant but is also a faithful representation of a firm's operating results (income statement), earnings retained in the business (retained earnings statement), financial position (balance sheet), and cash flows (statement of cash flows). The last assumption may not be valid, as the literature on earnings management suggests that some firms, especially during financial or

economic crises, use discretionary accruals to intentionally increase or decrease earnings and consequently manipulate other accounting items because all financial statements are interrelated by construction.

This study focuses on accrual-based earnings management during the coronavirus disease (COVID-19) pandemic. Instead of treating all firms the same, we first separate firms into new economies (firms in the technology industry) and old economy firms and demonstrate that new economy firms are less likely to use accrual-based earnings management than old economy firms. We then use out-of-sample earnings and earnings in the 2019 pre-pandemic year to identify loss-making firms (firms with negative earnings) as they have more incentive to reduce discretionary accruals than profit-making firms based on the big bath theory. We showed that the number of discretionary accruals decreased the most for old economy loss-making firms in the pandemic year (2020). We then document a reversal in accrual-based earnings management during the recovery year of the pandemic (2021) for these firms, as they reported the highest amounts of discretionary accruals. Because of this manipulation of accruals, we speculate that the explanatory power of earnings on stock prices would be affected the most by the old economy's loss of firms during the pandemic. However, our test results did not support this conjecture.

This study contributes to the literature on accrual-based earnings management by incorporating a discussion of the impacts of the evolution of the economy on the reporting of discretionary accruals and by using out-of-sample earnings to incorporate research on the value relevance of loss-making firms. We provide evidence through univariate and regression analyses to show that old economy loss firms managed their discretional accruals the most during the pandemic and during the recovery year of the pandemic. However, our test results show that this manipulation of earnings through discretionary accruals does not seem to decrease earnings' value relevance.

The remainder of this paper is organized as follows. Section 2 describes the literature review. Section 3 explains the research design and the development of the hypotheses. Section 4 describes our sample and provides summary statistics. Section 5 reports the empirical findings, and Section 6 concludes the paper.

LITERATURE REVIEW

Value Relevance of Earnings

The information provided in a company's financial statements is supposed to support (relevant and faithfully represent) users in making credit and/or investment decisions (Statement of Financial Accounting Concept, 2010). Prior research shows that financial statement items, particularly earnings, correlate with share prices. However, studies also show that the value relevance of earnings declines. Recent studies indicate that the association between stock prices and earnings is weaker for firms with more intangible assets (Lev and Zarowin, 1999) and loss-making firms (Collins et al., 1999).

Using traditional ordinary least squares regression and non-parametric classification and regression trees, Barth et al. (2021) found that the explanatory power of earnings on stock prices, R^2, declined from 1962 to 2018. However, they demonstrated that the combined value relevance of financial statement items categorized into five groups—earnings and equity book value, intangible assets, growth opportunities, and alternative measures of earnings, such as operating cash flow, revenue, special items, and other comprehensive income—has increased over time, except during the 1990s with the technology bubble. Barth et al. (2022) separated firms into three groups: old economic profit, old economic loss, and a new economy. They defined new economy firms as those in the technology industry or those that reported a loss in the year of their initial public offering. They find that the value relevance of earnings declines most noticeably for old economy loss firms. For new economy firms, intangible assets and growth opportunities are the most value-relevant.

COVID-19 and Big Bath Earnings Management

The coronavirus disease (COVID-19) pandemic began in late 2019. On January 21, 2020, in the United States, the Centers for Disease Control and Prevention announced the first COVID-19 case; more than one million cases were documented by the end of April 2020. Although multiple strategies have been put in place to control the transmission of this disease in the United States, the pandemic has surpassed World

War II in terms of the number of deaths. The pandemic has also created deep economic distress (Financial Times). It has impacted the financial markets and global economy since March 2020 and may continue in the foreseeable future, long after the pandemic has ended. Restrictions on social and economic activities have been lifted (Gourinchas, 2020).

Many companies have struggled to cope with the pandemic. Several studies examine the impact of COVID-19 on the accounting industry. For example, Chen et al. (2022) provide a comprehensive picture of corporate opportunistic timing behavior during the COVID-19 crisis. They found that firms are more likely to disclose unfavorable (favorable) forecasts on days when recent COVID-19 cases in headquarters' provinces increase (decrease). They also find that opportunistic timing behavior is more prominent in firms with higher managerial ownership, non-state ownership, and firms under financial distress. Liu and Sun (2022) found a significant decline in discretionary accruals from 2019 to 2020 for firms with a decrease in return on assets, suggesting that these firms engaged in more income-decreasing management to take a big bath in reporting earnings in the pandemic year.

This study extends the work of Liu and Sun (2022). We examine financial reporting practices during the pandemic and the recovery year of the pandemic. Haggard et al. (2015) noted that most big bath studies focus on the causes and short-term market reactions to big baths rather than their consequences. They often examine the association between firm characteristics and the recognition of large negative nonrecurring charges but ignore the future consequences of big bath behavior. Our study provides empirical evidence on firms' earnings management while the economy is recovering from the pandemic.

RESEARCH DESIGN AND HYPOTHESES DEVELOPMENT

We adopted the modified Jones model to calculate the discretionary accruals (DACs) reported by each sample firm and year.

$$\frac{TAC}{TA_{-1}} = \alpha_0 \left(\frac{1}{TA_{-1}}\right) + \alpha_1 \frac{(\Delta SALES - \Delta AR)}{TA_{-1}} + \alpha_2 \frac{PPE}{TA_{-1}} + \alpha_3 ROA + \varepsilon \quad (1)$$

where TAC = income before extraordinary items, less cash flow from operations;
TA_{-1} = total assets in year t-1, the lag year;
ΔSALES = change in sales from years t–1 to t.
ΔAR = change in accounts receivable from year t–1 to year t;
PPE = property, plant, and equipment (gross);
ROA = return on assets (=income before extraordinary items divided by TA_{-1}).

ε in equation (1) is used to measure the amount of DACs, which are actual accruals (TAC/TA_{-1}) and less non-discretionary accruals ($= \alpha_0(1/TA_{-1}) + \alpha_1(\Delta SALES - \Delta AR)/TA_{-1} + \alpha_2 PPE/TA_{-1} + \alpha_3 ROA$).

Accrual-Based Earnings Management: Old Economy Firms Versus New Economy Firms

As prior studies have shown, the power of earnings to explain the variance in stock prices across firms (measured by R^2) is lower for new economy firms than for old economy firms. In addition, the number of DACs in Equation (1) may not capture how the management of new economy firms is more likely to manage their earnings, such as increasing or reducing expenditures on advertising, R&D, and human capital. Therefore, we expect the number of DACs for new economy firms to be low or insignificant.

Hypothesis 1: *The amount of discretionary accruals for new economy firms will be low or insignificant during the sample period and will not have been affected by the pandemic.*

Accrual-Based Earnings Management: Profit Firms Versus Loss Firms

Prior studies on loss-making firms have shown that value relevance for earnings is low for loss-making firms, and loss-making firms may adopt a big bath strategy during the pandemic to report low amounts of

DACs and, therefore, low amounts of earnings. However, when the economy is recovering from the pandemic, the big bath incentive, if it exists, is weaker. Accordingly, we expected that the amount of DACs for loss-making firms during the pandemic would be low but high during the recovery phase of the pandemic. In addition, because we expected new economy firms not to engage in accrual-based earnings management, we propose the following two hypotheses:

Hypothesis 2: *Old economy loss-making firms have the lowest discretionary accruals during the pandemic.*

Hypothesis 3: *Old economy loss-making firms have the highest discretionary accruals during the pandemic recovery year.*

Finally, as previous research shows, the value relevance of earnings is low for loss-making firms. Assuming that old economy loss-making firms engage in accrual-based earnings management during the pandemic to reduce earnings and in the recovery phase of the pandemic to increase earnings, we expected that the value relevance of earnings would be even lower in 2020 to 2021 than in 2019, pre-pandemic.

Hypothesis 4: *The explanatory power of earnings on stock prices dropped the most for old economy loss-making firms during the pandemic from 2020 to 2021.*

SAMPLE AND DESCRIPTIVE STATISTICS

Our sample selection began with 13,950 firms covered in the Compustat North America database from 2017 to 2021. We excluded 4,265 firms (30.6%) not incorporated in the United States, 3,484 firms (25.0%) with missing 2-digit Standard Industry Classification (SIC) codes, 874 firms (6.3%) with 3-digit SIC codes (used to identify new economy firms) that changed during our sample period, 1,393 financial firms (10.0%) with 2-digit SIC codes between 60 and 67, and 1,995 firms (14.3%) with missing data needed for our analyses. We also deleted 222 firms (1.6%) whose 2019 fiscal year ended between February 1, 2020, and May 31, 2020, to ensure that our sample firms' fiscal year 2019 was prior to the first wave of the COVID-19 pandemic. Our final sample included 1,717 firms after winsorizing all the continuous variables at the 1st and 99th percentiles. We used the same set of firms for all our analyses, and therefore, a survivorship bias exists for this study because of the strong requirement for financial data not missing from 2017 to 2021.

We defined new economy firms as those in the following industries: computer hardware and software, pharmaceuticals, electronic equipment, and telecommunications (SIC codes 283, 357, 360-368, 481, 737, and 873) or firms with initial public offerings in 2019 or later that reported negative earnings before extraordinary items (Compustat item ib<0) in the initial public offering year. Loss firms reported negative income before extraordinary items (Compustat item, IB, less than zero), and profit firms were those with zero or positive IB in the fiscal year 2019. Table 1 reports the summary statistics for the 1,717 sample firms.

Because the same firms were used for all sample years and analyses in this study, we did not observe significant differences in size, leverage, and auditor (Big4) over time. However, the impact of COVID-19 on sales was clear because the changes in sales from 2019 to 2020 were the lowest, with a mean of 0.021. The economy seems to recover, as reflected in sales in 2021 (median 0.824) and changes in sales from 2020 to 2021 (mean = 0.327). The impact of the pandemic on market-to-book ratios, cash flows from operations, and expenditures on R&D was not obvious. For our research interest in earnings management, DAC and DAC_lag (both mean and median) were negative for every year, suggesting that from 2019 to 2021, firms adopted income-reducing earnings management. Regarding changes in the number of DACs, they were less negative (mean = -0.007) or positive (median = 0.014) from 2019 to 2020 but in a reverse pattern with a mean of 0.018 and a median of -0.010 from 2020 to 2021. The summary statistics for changes in DAC suggest that our sample firms might have adopted different accrual-based earnings management strategies during and in the recovery year of the pandemic.

EMPIRICAL FINDINGS

Univariate Analysis: Old Economy Firms Versus New Economy Firms

Our first empirical analysis compares the amount of DACs between old and new economy firms. Table 2 reports the results, with the average amounts of DACs reported in Panel A and the changes reported in Panel B.

The data in Panel A of Table 2 show that the amount of DACs was negative (consistent with the results in Table 1), and they were significantly different from zero for all the firms, regardless of whether they were in an old or new economy and every year from 2019 to 2021. Inconsistent with Hypothesis 1, new economy firms had more negative DACs than old economy firms in the pre-pandemic year (t-stat = 5.27, significant at the 1% level). The difference in the amount of DACs between these two groups of firms disappeared in the pandemic year 2020 but reappeared in 2021 with a t-stat equal to 5.45 (significant at the 1% level). The data in Panel B show that, overall, as reflected in the changes in the amount of DACs, firms appeared to change in how accrual-based earnings were managed from 2019 to 2020 (-0.0067) and from 2020 to 2021 (0.0183). However, they were not significantly different from zero. We observe that old economy firms demonstrate a significant drop (-0.0541 at the 5% significance level) in DAC from 2019 to 2020 and a 0.0648 increase (also significant at the 5% level) from 2020 to 2021. By contrast, new economy firms showed the opposite pattern: positive changes in DAC from 2019 to 2020 (0.0808, significant at the 5% level) and negative changes in DAC from 2020 to 2021 (-0.0677, significant at the 10% level). The differences in the changes in the number of DACs between these two groups of firms were statistically significant for both 2019–2020 and 2020–2021.

The results in Table 2 do not support Hypothesis 1; the amounts of DACs for new economy firms were low or insignificant, but the old economy and new economy firms adopted different accrual-based earnings management during the pandemic year and the recovery year of the pandemic.

Discretionary Accruals: Profit Firms Versus Loss Firms

Instead of using changes in returns on assets with earnings, including the amount of DACs, as in Liu and Sun (2022), we use the sign of earnings in the pre-pandemic year 2019 to separate firms into profit and loss. We then compared their year-to-year changes in the amount of DACs for old and new economy firms. Table 3 reports the results for the old economy firms (Panel A) and new economy firms (Panel B).

For the profit firms, the results in Table 3 show that for the old economy profit firms, there was little change in how they managed their accrual-based earnings. However, changes in the amount of DOCs for the new economy profit firms were positive (0.1954, significant at the 1% level) from 2019 to 2020 and negative (-0.0754, significant at the 1% level) from 2020 to 2021. Similar to old economy profit firms, new economy loss firms did not seem to change how they managed their accrual-based earnings during the sample years. In comparison, old economy loss firms adopted a more conservative approach, with changes in the number of DACs being a negative 0.1773 (significant at the 1% level) in the pandemic year 2020 and a less conservative approach in the pandemic recovery year 2021 (changes in the amount of DACs were positive 0.1811 with 1% significance level). The difference in changes in the amount of DACs between profit and loss firms was significant at the 5% level for the old economy firms from 2019 to 2020 and from 2020 to 2021 but only from 2019 to 2020 for the new economy firms.

Combining the results for all old and new economy firms reported in Table 2. The results in Table 3, with each type separated by profit or loss, we conclude that it is likely that loss-making firms for the old economy (conservative in 2020 and aggressive in 2021) and profit firms for the new economy (aggressive in 2020 and conservative in 2021) drove the results reported in Table 2.

Tables 2 and 3 compare the amount of DACs and year-to-year changes without considering other firm characteristics shown in prior literature related to the amount of DACs. In the difference-in-differences regression analysis described below, we considered these explanatory variables.

Difference-in-Difference Regression Analyses

Old Economy Firms Versus New Economy Firms

To analyze the amount of DACs used by old and new economy firms, we regressed DAC on YR_0 (year of research interest), OLD (indicator for Old Economy firms), and firm characteristics that have been shown to be associated with the amount of DACs in prior studies. This regression included all sample firms and was run for the pandemic period (2019-2020) and the pandemic recovery period (2020-2021) separately.

$$DAC = \beta_0 + \beta_1 YR_0 + \beta_2 OLD + \beta_3 YR_0 * OLD + control\ variables + \varepsilon \quad (2)$$

where YR_0 is the dummy variable for the year of interest. It was coded as 1 for observations in the 2020 pandemic year (2021 recovery year) in the 2019-2020 (2020-2021) regression and 0 for the 2019 (2020) observation in the 2019-2020 (2020-2021) regression. OLD is a dummy variable coded 1 for old economy firms and 0 otherwise.

The intercepts for the 2019-2020 regression and–2020-2021 regression were negative, suggesting that the amount of DAC was negative for new economy firms in 2019 and 2020. This is consistent with the results reported in Table 2, Panel A. However, these negative amounts are not statistically different from zero after controlling for other firm characteristics in the regression analysis. Therefore, consistent with Hypothesis 1, new economy firms do not appear to be engaged in accrual-based earnings management.

Other results from the 2019-2020 regression provide findings not available in the univariate analyses reported in Tables 2 and 3. After including the controlling variables, the results indicate a significant increase (at the 1% significance level) of 0.157 (coefficient for YR_0) in the number of DACs for a firm in 2020 or a significant increase (at the 1% significance level) of 0.101 (coefficient for OLD) if the firm was an old economy firm. However, the amount of DACs for an old economy firm in the pandemic year 2020 (coefficient for YR_0*OLD) is expected to be lower by 0.190 (significant at the 1% level), indicating that an old economy firm used more conservative accrual-based earnings management in the pandemic year. We believe that the result for YR0*OLD suggests that old economy firms engaged in the most conservative accrual-based earnings management in the pandemic year and that these firms would have higher discretionary accruals because they are old economy firms (0.157, coefficient for YR_0) and because the year was 2020 (0.101, coefficient for OLD).

As for the recovery phase of the pandemic, from 2020 to 2021, the results in Table 4 show that the amount of DACs was expected to be significantly (at the 1% level) lower by 0.067 (coefficient for YR_0) for 2021 or 0.067 (coefficient for OLD) if it was an old economy firm. However, for old economy firms in the pandemic recovery year (coefficient of YR_0*OLD), the amount of DACs was expected to be higher by 0.115 at the 5% significance level, suggesting a strong reversal of how old economy firms managed accrual-based earnings in the recovery of the pandemic year.

The regression results for the pandemic period (2019–2020) and the pandemic recovery period (2020–2021) suggest that old economy firms engage in different accrual-based earnings management than new economy firms: more conservative in the pandemic year (2020) and more aggressive in the pandemic recovery year (2021). These results support Hypothesis 1: New economy firms in both the pandemic and recovery years did not engage in accrual-based earnings management. Therefore, we focus on old economy firms in the regression analysis described below.

Old Economy: Loss Firms Versus Profit Firms

Because we found that old economy firms engaged in more (less) conservative accrual-based earnings management in the pandemic (recovery) year, the next regression examined these old economy firms further by separating them into two groups based on whether their earnings in the pre-pandemic year, 2019, were negative (LOSS).

$$DAC = \beta_0 + \beta_1 YR_0 + \beta_2 LOSS + \beta_3 YR_0 * LOSS + control\ variables + \varepsilon \quad (3)$$

where YR_0 is the dummy variable for the year of interest. It was coded as 1 for observations in the 2020 pandemic year (2021 recovery year) in the 2019-2020 (2020-2021) regression and 0 for the 2019 (2020) observation in the 2019-2020 (2020-2021) regression. LOSS is a dummy variable coded as 1 if the 2019 earnings are negative and 0 otherwise. The regression results are presented in Table 5.

The negative sign for the intercept for both regressions (–0.040 from the 2019 to 2020 regression and –0.052 from the 2020-2021 regression) indicates that old economy profit firms reported negative amounts of DACs in the pre-pandemic year, 2019, and in the pandemic year, 2020. However, neither was significantly different from zero. The results from the 2019-2020 regression suggest that the amount of DACs was expected to be higher by 0.011 (coefficient for YR_0, insignificant) for 2020 or 0.039 (coefficient for LOSS, significant at the 10% level) for loss-making firms. However, for a loss-making firm in the pandemic year 2020, the coefficient for YR_0*LOSS suggests that the amount of DACs was expected to be significantly (at the 5% level) lower, reducing earnings by 0.161. Although this result was similar to Liu and Sun's findings, which showed that firms with a decline in return on assets (ED=1) had lower discretionary accruals in 2020 relative to firms with no decline, our research design used out-of-sample (pre-pandemic) earnings to better control for firms' incentives to manipulate accrual-based earnings.

For the recovery of the pandemic, the 2020-2021 regression results reported in Table 5 show a reversal of accrual-based earnings management for old economy loss firms, while the coefficient for LOSS was negative at 0.101 (significant at the 10% level), implying that the amount of DACs was 0.101 lower (more aggressive accrual-based earnings management) for old economy loss firms than for old economy profit firms during 2020-2021. The opposite was true for these loss-making firms in the pandemic recovery year 2021 when the coefficient for YR_0*LOSS was 0.135, positive, and significant at the 5% level. The latter result indicates a reversal of accrual earnings management from conservative in the 2020 pandemic year to the 2021 recovery year for firms that have lost their old economy.

Overall, the results presented in Tables 4 and 5 support Hypothesis 2; the amount of DACs was lowest for old economy loss-making firms in the pandemic year 2020. The results also support Hypothesis 3, which states that the amount of DACs was highest for the old economy loss firms in the pandemic recovery year 2021. Our empirical results suggest that old economy loss-making firms engaged the most in using discretionary accruals to manage their earnings, supporting Hypothesis 4, which states that the relevance of earnings in explaining stock prices might have been low. Our subsequent analysis focuses on earnings' value relevance.

Value Relevance Analysis

We first ran the regression of stock price per share on (1) book value per share and then on (2) book value per share and earnings per share. The changes in the adjusted R^2 from the first to the second regression were used to measure the increase or decrease in the power of earnings to explain the variance in stock prices. Panel A of Table 6 reports the results for old economy firms, and Panel B reports the results for new economy firms.

Table 6 shows that for both old and new economy firms, the value relevance of earnings for-profit firms dropped in the period from 2019 to the pandemic period (2020-2021), and the drop was more significant for the new economy firms (42.49% to 27.09%, a 15.4% drop) compared with the old economy firms (40.03% to 30.59%, a 9.44% drop). For the loss firms, value relevance for the new economy firms also dropped from 3.26% to 0.26%. However, value relevance for earnings actually increased from negative 0.15% to 1.17% for the old economy loss firms. Therefore, the results in Table 6 did not support Hypothesis 4, which was that value relevance would drop the most for the old economy loss firms due to their engaging in earnings manipulation during the pandemic, 2020 and 2021.

CONCLUSION

Disruptions caused by the COVID-19 pandemic are enormous, both socially and economically. As the economy evolved from manufacturing to one that includes more services and technology, we have documented the impact of the pandemic on accrual-based earnings management for firms in different

economies. We first show that discretionary accruals for new economy firms are insignificant after controlling for firm characteristics. We further separated firms based on the sign of earnings reported prior to the pandemic and found that old economy loss-making firms appeared to manipulate the amount of discretionary accruals the most. Our findings support those of prior studies that found that loss-making firms reduced the amount of discretionary accruals the most to make their earnings worse during the pandemic year. In addition, these firms did the opposite in the pandemic recovery year, increasing discretionary accruals. With the greatest manipulation of earnings, we expected to find low-value relevance of accounting earnings during the pandemic for these firms. However, our empirical results did not support this hypothesis. Our findings suggest that more research is needed to connect accrual-based earnings management with the value relevance of earnings. In addition, more research is needed to examine whether and how firms in the new economy engage in earnings management.

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APPENDIX

TABLE 1
SUMMARY STATISTICS (2019 TO 2021)

	2019		2020		2021	
	Mean	Median	Mean	Median	Mean	Median
DAC	-0.145	-0.042	-0.152	-0.016	-0.139	-0.033
DAC_lag	-0.021	-0.023	-0.145	-0.042	-0.157	-0.016
ΔDAC	-0.124	-0.012	-0.007	0.014	0.018	-0.010
Size	7.099	7.358	7.183	7.417	7.311	7.527
Leverage	0.936	0.643	1.004	0.631	0.854	0.581
MB	3.598	2.300	4.638	2.420	4.399	2.549
Sales	0.895	0.724	0.781	0.636	0.824	0.670
ΔSales	0.162	0.038	0.021	-0.039	0.327	0.161
CFO	-0.005	0.071	0.027	0.074	0.028	0.064
ΔDebt	2.242	0.127	1.177	0.033	0.639	-0.013
ΔEquity	0.079	0.045	0.194	0.039	0.266	0.103
Big4	0.732	1.000	0.727	1.000	0.730	1.000
R&D	0.479	0.000	0.701	0.000	0.595	0.000

DAC is the dollar amount of discretionary accruals and the residual value from Equation (1). DAC_lag denotes the DAC in year t-1. ΔDAC is the change in DAC from year t-1 to year t. Size is the natural logarithm of total assets. Leverage is defined as the ratio of long-term debt to common equity. MB is the ratio of market value to the book value of common equity. Sales is the dollar amount divided by total assets. ΔSales is the change in sales from year t-1 to year t divided by sales in year t-1. CFO is the cash flow from operations divided by total assets. ΔDebt is the change in long-term debt divided by long-term debt in year t-1. ΔEquity is the change in common equity divided by common equity in year t-1. Big4 is coded as 1 for Big Four auditors, and 0 otherwise. R&D is the amount of R&D expense divided by sales.

TABLE 2
DISCRETIONARY ACCRUALS (2019 TO 2021)

Panel A: Average Discretionary Accruals				
	All Firms	Old Economy	New Economy	Old vs. New
No. of Obs.	1,709	1,114	603	
2019	-0.1448***	-0.1053***	-0.2177***	t-stat= 5.27***
2020	-0.1520***	-0.1599***	-0.1375***	t-stat= -0.48
2021	-0.1385***	-0.1026***	-0.2049***	t-stat= 5.45***
Panel B: Changes in Discretionary Accruals				
	All Firms	Old Economy	New Economy	Old vs. New
2019 to 2020	-0.0067	-0.0541**	0.0808**	t-stat= -3.06**
2020 to 2021	0.0183	0.0648**	-0.0677*	t-stat= -3.22***

Discretionary accruals are the dollar amount of discretionary accruals and the residual value from Equation (1). ***, **, and * are the two-tailed significance at the level of 1%, 5%, and 10%, respectively.

TABLE 3
MEAN YEAR-TO-YEAR CHANGES IN DISCRETIONARY ACCRUALS
(2019 TO 2020 AND 2020 TO 2021)

Panel A: Old Economy Firms			
	Profit Firms	Loss Firms	Profit vs. Loss
Number of Obs.	825	289	
2019 to 2020	-0.0109	-0.1773***	t-stat= 3.02**
2020 to 2021	0.0241	0.1811***	t-stat=-2.97**
Panel B: New Economy Firms			
	Profit Firms	Loss Firms	Profit vs. Loss
Number of Obs.	249	354	
2019 to 2020	0.1954***	0.0002	t-stat= 2.42**
2020 to 2021	-0.0754**	-0.0623	t-stat=-0.18

Discretionary accruals are the dollar amount of discretionary accruals and the residual value from Equation (1). *** and **are the two-tailed significance at the level of 1% and 5%, respectively.

TABLE 4
REGRESSION ANALYSIS - OLD ECONOMY FIRMS VERSUS NEW ECONOMY FIRMS

	2019-2020	**2020-2021**
Intercept	-0.100	-0.021
YR_0	0.157***	-0.067*
OLD	0.101***	-0.067*
YR_0*OLD	-0.190***	0.115**
Size	0.004	0.010
Leverage	-0.001	-0.000
MB	0.001	0.000
ΔSales	0.046	0.038**
Sales	-0.112***	-0.100***
CFO	-0.179*	-0.330*
ΔDebt	0.001	0.002*
ΔEquity	-0.008	-0.004
Big4	0.059*	0.051
R&D	0.009***	0.009***
DAC_lag	0.337***	0.002
No. of Observations	3,434	3,434
Adjusted R^2	32.2%	30.1%

where YR0 is a dummy variable for the year of interest. It is coded as 1 for observations in the 2020 pandemic year (2021 recovery year) in the 2019-2020 (2020-2021) regression and 0 for the 2019 (2020) observation in the 2019-2020 (2020-2021) regression.
OLD is a dummy variable coded 1 for old economy firms and 0 otherwise. All the other variables are listed in Table 1.

TABLE 5
REGRESSION ANALYSIS – OLD ECONOMY: LOSS FIRMS VERSUS PROFIT FIRMS

	2019-2020	2020-2021
Intercept	-0.040	-0.052
YR_0	0.011	0.008
LOSS	0.039*	-0.101*
YR_0*LOSS	-0.161**	0.135**
Size	0.012	0.015
Leverage	-0.004	-0.004
Market-to-Book	0.002	0.001
ΔSales	-0.007	0.023
Sales	-0.070***	-0.068***
CFO	-0.133**	-0.273**
ΔDebt	0.000	0.000
ΔEquity	-0.001	-0.001
Big4	0.011	-0.020
R&D	0.039***	0.008
DAC_lag	0.448***	-0.094
No. of Observations	2,228	2,228
Adjusted R^2	40.2%	36.2%

where YR0 is a dummy variable for the year of interest. It is coded as 1 for observations in the 2020 pandemic year (2021 recovery year) in the 2019-2020 (2020-2021) regression and 0 for the 2019 (2020) observation in the 2019-2020 (2020-2021) regression.
LOSS is a dummy variable coded as 1 for firms with negative earnings before extraordinary items in the fiscal year 2019 and 0 otherwise. All the other variables are listed in Table 1.

TABLE 6
VALUE RELEVANCE ANALYSIS (ADJUSTED R^2)

Panel A: Old Economy Firms

	Profit Firms (825 Firms)		Loss Firms (289 Firms)	
	2019	2020-2021	2019	2020-2021
BVPS	10.74%	14.66%	56.62%	65.85%
BVPS and EPS	50.77%	45.25%	56.47%	67.02%
Incremental	40.03%	30.59%	(0.15%)	1.17%

Panel B: New Economy Firms

	Profit Firms (825 Firms)		Loss Firms (289 Firms)	
	2019	2020-2021	2019	2020-2021
BVPS	11.92%	12.49%	26.19%	18.83%
BVPS and EPS	54.41%	39.58%	29.45%	19.09%
Incremental	42.49%	27.09%	3.26%	0.26%

Incremental is the adjusted R^2 from the regression that includes both book value per share (BVPS) and earnings per share (EPS), and the adjusted R^2 from the regression that includes only BVPS. The incremental amount is used to measure the power of earnings to explain variance in stock prices.