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CASH FLOW MANAGEMENT: AN EXAMINATION OF ROUNDING PHENOMENON IN OPERATING CASH FLOWS

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Article Info

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Abstract

This study investigates whether firms round up their operating cash flows and whether this behavior is more prevalent in firms listed in the OTC market compared to those listed in the three major US stock exchanges. Using Benford's law, we find that firms listed in the three major stock exchanges round up earnings but not operating cash flows. However, firms listed in the OTC market round up both earnings and operating cash flows. We also discover that loss firms are more likely to round up operating cash flows than profit firms. Our results support the prediction that firms in the OTC market are more likely to round up operating cash flows than those in the three major stock exchanges. Our study is crucial as it reveals the potential for firms to manipulate accounting numbers by rounding up operating cash flows and provides the first empirical evidence of this phenomenon. This manipulation of operating cash flows could impact the valuation of equity securities for investors and financial analysts using cash flow-based valuation models.

INTRODUCTION

The rounding phenomenon of reported earnings has been extensively documented in the prior literature (e.g., Das and Zhang, 2003; Kinnunen and Koskela, 2003; Guan et al., 2008; He et al., 2013; Lebert et al., 2020; He et al., 2021). Empirically, this phenomenon is demonstrated by an excess of zeros and a lack of the number nine as the second digit of reported earnings. Researchers cite this phenomenon as evidence that managers engage in earnings management activities to mislead users of financial reports. Even though both earnings and cash flow from operations (CFO) are used extensively by investors and financial analysts in equity valuation, prior literature on the rounding phenomenon focused on earnings, while totally ignored operating cash flows. Whether firms round up CFO, as they round-up earnings, is an important empirical question and the answer is not clear. On the one hand, firm managers have incentives to round up CFO to paint a rosy picture of firms' performance; but on the

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other hand, it is much more difficult to manipulate CFO than to manipulate the accrual component of earnings, especially in an environment with strict rules and disclosure requirement. This study examines whether and the extent to which firms actually round-up CFO in practice, providing the first piece of empirical evidence on the rounding phenomenon in operating cash flows.

Most prior studies examined the rounding phenomenon for firms listed in the three major stock exchanges (i.e., New York Stock Exchange, NASDAQ, and American Stock Exchange), while ignoring firms in the Over-the Counter (OTC) market. In this study, we follow He et al. (2021) to examine firms in both the three major stock exchanges and the OTC market to provide a more comprehensive picture of the rounding phenomenon. Firms listed in the OTC market face fewer disclosure-related eligibility requirements, and their voluntarily disclosed financial statements are not audited; in contrast, firms listed in the three major stock exchanges are subject to stricter rules and regulations and disclosure requirement. Therefore, we examine the round-up of CFO for firms in the three major stock exchanges and for firms in the OTC market separately, expecting the round-up to be more severe for firms in the OTC market than for firms in the three major stock exchanges. Such a comparison shed lights on the effectiveness of current disclosure requirement to mitigate firms' activities to manipulate accounting numbers.

When firms report losses, earnings are less useful in firm valuation and investors rely more on cash flow to value equity securities; therefore, we predict that loss firms have more incentive and are more likely to round-up cash flows than profit firms. To test this prediction, we partition the sample into profit-firm and loss-firm subsamples and examine their rounding behaviors separately. We also compare the magnitude of the round-up for these two sub-samples, expecting the round-up of CFO to be more severe for loss firms than for profit firms.

We obtain our initial sample from COMPUSTA Annual File for the time period 1951 to 2021. We follow the methodologies developed by prior studies (e.g., Carslaw, 1988; Thomas, 1989) to examine the actual vs. expected frequency distribution in the second digit of earnings and CFO to empirically document the rounding phenomenon. Consistent with prior studies, we find that firms round-up earnings, and this result holds for both firms listed in the three major stock exchanges and firms listed in the OTC market; furthermore, we find that the round-up of earnings is more severe for firms in the OTC market than for firms in the three major stock exchanges. With regard to CFO, we find that firms listed in the three major stock exchanges do not round-up CFO, but firms listed in the OTC market do round up CFO; we also find that although both profit firms and loss firms in the OTC sample round-up CFO, the magnitude of roundup is higher for loss firms than for profit firms. These results combined provide consistent evidence that firms do have incentives to round up operating cash flows to paint a rosy picture of the firms' future prospect. However, it is more difficult to round-up CFO than to round-up the accrual component of earnings; as a result, in an environment where the rules and regulations are strict (i.e., the three major stock exchanges), firms do not have enough opportunities to round-up CFO; while in an environment where the rules and regulations are weak (i.e., OTC market), firms do round-up CFO, especially when firms are reporting losses and investor relying more heavily on CFO to value equity securities.

This study contributes to the literature as follows. First, it fills a void in the literature and provides the very first piece of empirical evidence on the round-up of operating cash flows. Second, most prior studies in the rounding phenomenon focused on firms in the three major U.S. stock exchanges, while ignoring firms in the OTC market. This study examines the rounding phenomenon in both of these two types of markets, providing a more complete picture of the rounding phenomenon. By comparing the rounding phenomenon in the two types of markets, this study provides evidence for the effectiveness of the stricter disclosure requirement in the three major stock exchanges to curve firms' activities to manipulate accounting numbers. Lastly, results from this study also help scholars and investors better understand the less-explored OTC market.

The rest of the paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 describes the sample selection process and our research design. Section 4 reports empirical results, and Section 5 summarizes and concludes the study.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In the rounding phenomenon literature, Carslaw (1988) was the first study to document the rounding of reported earnings among New Zealand firms. Thomas (1989) examines the rounding phenomenon in U.S. firms listed in the three major stock exchanges (i.e., New York Stock Exchange, NASDAQ, and American Stock Exchange) and report similar findings. Das and Zhang (2003) extend Thomas (1989) and document that managers exercise their discretion to round up earnings and firms use working capital accruals to round up earnings to meet behavioral thresholds, such as reporting positive earnings, sustaining recent levels of performance and meeting analysts' forecasts. Guan et al. (2008) analyze the pattern of rounding of reported earnings across U.S. industries and find that high-tech firms tend to have the highest occurrences of rounding. He et al. (2012) examine the rounding phenomenon in reported revenues and find that rounding manipulation is also prevalent in reported revenues. All these U.S.-based studies focused on firms listed in the three major stock exchanges, while ignoring firms listed in the OTC market. He et al. (2021) fills this void in the literature, examining the rounding phenomenon in the OTC market. They find that firms in the OTC market round-up earnings and revenues, and the magnitude of rounding in the OTC market is more severe than that in the three major stock exchanges.

Even though both earnings and operating cash flows are extensively used by investors and financial analysts to evaluate firm performance, prior literature on the rounding phenomenon focused on earnings, while totally ignored operating cash flows. Whether firms round up operating cash flows, as they round-up earnings, is an important empirical question and the answer is not clear. On the one hand, cash flow is a very important determinant of a firm's future prospect, especially in the presence of earnings management. Prior studies (e.g., Courteau et al. 2001, and Francis et al. 2000) compare the usefulness of earnings and cash flows in equity valuation and find that earnings-based valuation model outperform cash flow-based valuation model to predict firm value; however, a subsequent study, Courteau et al. (2015), find that earnings management impairs the performance of earnings-based valuation model to predict firm value; in the presence of earnings management, cash flow is more useful than earnings in equity valuation. Due to the importance of cash flows in equity valuation, firm managers have incentives to round up operating cash flows to paint a rosy picture for the firms' current performance and future prospect.

On the other hand, even though firms have incentives to manipulate and round-up cash flows, they may not have the opportunities to do so. This is because it is more difficult for firms to manipulate operating cash flows than to manipulate the accrual component of earnings, especially when the decision to round-up is made at the end of a reporting period. In particular, Das and Zhang (2003) document that to round-up earnings, firms manipulate the working-capital accruals rather than the operating cash flow component of earnings. The manipulation of the accruals includes booking revenue in advance, decreasing allowances for bad debts and sales returns, and overestimating the amount of expenses prepaid, etc. Such actions can be taken at the end of a reporting period when firm managers realize they need to round-up earnings to report a higher EPS. The manipulation of the operating cash flows involves taking real economic actions such as cutting R&D expenditure, offering products at discounted price to boost sales revenue, and delaying profitable projects, etc. To manipulate operating cash flows through real activities is more difficult than to manipulate working capital accruals, because taking real economic activities requires longer time, and may not be feasible near the end of the reporting period. Therefore, even though firms have incentives to round up operating cash flows, they may not have the opportunities to do so. Due to these two conflicting forces, whether firms round-up CFO in practice is an empirical question open to examination. We state our first hypothesis in the alternative form:

H1: *Firms have incentives to round-up CFO, and they round-up CFO in practice.*

Firms' ability to round-up CFO depends on whether there is enough flexibility in the reporting environment. That is, in an environment where the rules and regulations governing firms' reporting practice is strict, firms have fewer opportunities to round-up operating cash flows; while in an environment where the rules and regulations governing firms' reporting practice is weak, firms are more likely to round-up operating cash flows. This motivates us to examine firms in the three major stock exchanges and firms listed in the OTC market separately,

because as explained in the next paragraph, the reporting environment is much weaker in the OTC market than in the three major stock exchanges.

The U.S. OTC market includes the OTC Bulletin Board (OTCBB) market and the OTC Pink Sheets (OTCPS) market. The OTCBB is an electronic quotation medium operated by the National Association of Securities Dealers (NASD) and the OTCPS is an American financial market providing price and liquidity information for almost 10,000 OTC securities. The OTC market represents an economically significant portion of public listed firms in the United States (Jiang, et al., 2016). Many firms in the OTC markets do not meet the listing requirements to trade on the major stock exchanges such as NYSE, NASDAQ, and AMEX. Their voluntarily disclosed financial statements are not audited. White (2016) finds that when the OTC-listed companies have fewer disclosure-related eligibility requirements, they frequently become the targets of alleged market manipulations and generate more negative investment returns. Therefore, we examine the rounding of operating cash flows for firms listed in the three major stock exchanges and for firms listed in the OTC market separately and we predict that firms in the OTC market are more likely to round-up operating cash flows than firms listed in the three major stock exchanges. We state our second hypothesis (in the alternative form) as follows:

H2: *Firms in the OTC market are more likely to round up operating cash flows than firms listed in the three major stock exchanges.*

There are two competing valuation models that investors and financial analysts use to value equity securities – Residual Income Valuation model (RIM) and Discounted Cash Flow (DCF) model. RIM uses earnings as model input, while DCF uses operating cash flow as model input. Since RIM uses earnings as model input to calculate firm's intrinsic value, when firms report losses (earnings are negative), RIM does not work properly to value equity security. Therefore, when firms report losses, investors and financial analysts rely more on cash flow-based DCF model to calculate firm's intrinsic value. As a result, we examine the rounding of operating cash flows by profit firms and loss firms separately and we predict that loss firms are more likely to round-up operating cash flows than profit firms. We state our third hypothesis (in the alternative form) as follows:

H3: *Rounding of CFO is more severe among loss firms than among profit firms.*

SAMPLE STATISTICS AND RESEARCH METHODOLOGY

Our initial sample consists of all U.S. companies in the COMPUSTAT database from 1951 to 2021. To be included in the final sample, firms need to have both annual cash flow from operations and net income information in CAMPUSTAT. The total number of sample observations with positive operating cash flow data is 176,256, consists of 126,394 in the three major stock exchanges and 49,862 in the OTC market. For both the three major stock exchange sample and the OTC sample, we partition the sample into profit-firm and loss-firm sub-samples. In the three major stock exchanges, there are 102,979 observations in the profit firm sub-sample and 23,415 observations in the loss firm subsample. In the OTC market, there are 33,354 observations in the profit firm sub-sample and 16,508 observations in the loss firm subsample.

We follow the methodologies developed by prior studies to empirically document the rounding phenomenon. Benford's law suggests that the expected distributions of naturally occurring numbers are skewed toward the number zero in the second position of a multi-digit number. Benford (1938) documents that the expected proportions or occurrence of a number as the first digit in a number series can be approximated by the following equation:

$$proportion\ (a\ is\ the\ first\ digit) = g_{10}(a+1) - Log_{10}(a) \qquad (1)$$

The expected proportion of a given number a as the first digit and the number b as the second digit can be calculated with the following formula:

$$\text{Log}_{10}\left(a + \frac{b+1}{10}\right) - \text{Log}_{10}\left(a + \frac{b}{10}\right). \quad (2)$$

An overall expected proportion for b as the second digit can be found by summing over all possible a values for any b value as follows:

proportion (*b is the second digit*) $= \sum \left(\text{Log}_{10} \left(a + \frac{b+1}{10} \right) - \text{Log}_{10} (a + 10^b) \right)$. (3)

Table 1 provides the expected frequency for each digit in the second place of a number. If managers manipulate reported earnings and revenues by altering the actual financial numbers, then there would be significant deviations from the expected frequency in the second position.

TABLE 1 EXPECTED FREQUENCY OCCURRENCES FOR EACH DIGIT IN THE SECOND PLACES OF EARNINGS

Digit	0	1	2	3	4	5	6	7	8	9
Second Digit Expected Frequency Percentage	11.97	11.39	10.88	10.43	10.03	9.67	9.34	9.04	8.76	8.5

Source: Nigrini and Mittermaier (1997).

To test the first hypothesis that firms round up reported CFO, we compare the observed frequency for each number *x* in the second place of the reported CFO to the expected occurrences of the number demonstrated in Table 1 as predicted by Benford's law. We use a normally distributed Z-statistic to perform a significance test of the observed deviations from the expected proportions:

$$Z = \frac{|p - p_0| - \frac{1}{2n}}{\sqrt{p_0(1-p_0)}} \quad (4)$$

where p and p_0 are the observed and expected proportions, respectively. The sample size is represented by n. The second term in the numerator is a correction term, and should be applied only when it is smaller than $|p - p_0|$ (Thomas, 1989). These Z-statistics would reject the null hypothesis at the ten, five, and one percent level if their values exceed 1.64, 1.96, and 2.57, respectively.

We follow Fleiss (1981, p23) and use the Z-statistic to examine the statistical significance of the difference between two samples (e.g., OTC sample and major stock exchange sample): The formula used to calculate this difference is:

$$Z = \frac{|p_i - p_j| - \frac{1}{2}(1/n_i + 1/n_j)}{\sqrt{\overline{p}\overline{q}(1/n_i + 1/n_j)}} \quad (5)$$

where $\overline{q} = 1 - \overline{p}$, $\overline{p} = n_i/(n_i+n_j)$, n_i is the total observations of variable i, n_j is the total number of observations of variable *j*, p_i = proportion of zero as the second digit of variable *i*, and p_j = proportion of zero as the second digit of variable *j*.

EMPIRICAL RESULTS

We first examine the round-up of earnings to validate results from prior studies (e.g., He et al., 2021). This establishes a baseline for our analysis on the round-up (or lack of round-up) of operating cash flows. Table 2 reports the empirical distribution of the second digits in annual earnings, where Panel A reports results for all profit firms, Panel B reports results for profit firms listed in the three major U.S. stock exchanges, Panel C reports results for profit firms listed in the OTC market, and Panel D compares the difference in the magnitude of rounding by firms in OTC market and by firms in the three major stock exchanges. As shown in Panel A, 12.69% of the sample observations report zero as the second digit; compared to the expected frequency of 11.97%, the 0.72% deviation is statistically significant at a 1% level (Z stats = 8.22). This provides evidence that as documented by prior studies, firms round-up earnings to paint a rosy picture of firms' performance. Similar results are found for firms in the three major stock exchanges (as reported in Panel B) and for firms in the OTC market (as reported in Panel C). Lastly, results in Panel D show that the difference in the magnitude of earnings round-up between the OTC market and three major stock exchanges is 1.11% and this difference is statistically

significant at 1% level (Z = 5.28). Overall, results in Table 2 validate prior findings that firms round up earnings and the rounding is more sever in the OTC market than in the three major stock exchanges.

TABLE 2 FREQUENCY DISTRIBUTIONS OF SECOND DIGITS IN ANNUAL NET INCOME FOR PROFIT FIRMS IN THREE MAJOR STOCK EXCHANGES AND THE OTC MARKET

Panel A: Distributions of second digits in annual earnings for All profit firms (136,333 observations)

	0	1	2	3	4	5	6	7	8	9
NI	12.69	11.48	10.88	10.42	9.94	9.61	9.32	8.89	8.63	8.14
Deviation	0.72	0.09	0.00	-0.01	-0.09	-0.06	-0.02	-0.15	-0.13	-0.36
Z statistics	***8.22***	*0.99*	*0.02*	*0.08*	*1.08*	*0.77*	*0.22*	*1.96*	*1.68*	*4.76*

Panel B: Distributions of second digits in annual earnings for 3Exchanges profit firms (102,979 observations)

	0	1	2	3	4	5	6	7	8	9	
NI	12.42	11.43	11.00	10.43	9.98	9.64	9.39	8.89	8.59	8.24	
Deviation		0.45	0.04	0.12	0.00	-0.05	-0.03	0.05	-0.15	-0.17	-0.26
Z statistics		***4.46***	*0.36*	*1.19*	*0.02*	*0.51*	*0.34*	*0.58*	*1.69*	*1.98*	***3.02***

Panel C: Distributions of second digits in annual earnings for OTC profit firms (33,354 observations)

	0	1	2	3	4	5	6	7	8	9	
NI	13.53	11.63	10.51	10.39	9.82	9.52	9.10	8.88	8.77	7.84	
Deviation		1.56	0.24	-0.37	-0.04	-0.21	-0.15	-0.24	-0.16	0.01	-0.66
Z statistics		**8.77**	1.35	2.15	0.20	1.27	0.94	1.48	0.99	0.07	4.29

Panel D: Comparison of the distributions of second digits in earnings between OTC firms and 3 Exchanges firms

	0	1	2	3	4	5	6	7	8	9	
Difference		1.11	0.20	-0.48	-0.04	-0.16	-0.12	-0.29	0.00	0.19	-0.39
Z statistics		***5.28***	*0.99*	*2.46*	*0.19*	*0.85*	*0.65*	*1.58*	*0.02*	*1.05*	*2.27*

Next we examine the round-up of CFO by all firms listed in the three major stock exchanges and the OTC market and report results in Table 3 Panel A. As shown in Panel A, 12.39% of firms report zero in the second digit of cash flow; compared to the expected frequency of 11.97%, the difference of 0.42% is statically significant at 1% level (Z stats = 5.41). These results provide evidence in support of H1a that firms have incentives to and do actually round-up CFO in practice to paint a rosy picture of firms' performance. Next, we examine the rounding of CFO by firms listed in the three major stock exchanges and firms listed in the OTC market separately and report the results in Table 3 Panel B and C. As shown in Panel B, 12.01% of firms in the three major stock exchanges report zero in the second digit of cash flow; compared to the expected frequency of 11.97%, the difference of 0.04% is not statically significant (Z stats = 0.43). This result does not provide evidence that firms listed in the three major stock exchanges roundup CFOs. In contrast, results in Panel C shows that 13.35% of firms in the OTC market report zero as the second digit; compared to the expected frequency of 11.97%, the 1.38 deviation is statistically significant at 1% level (Z = 9.49). This provides evidence that firms in the OTC market round-up cash flow. When we compare firms listed in the three major stock exchanges and firms in the OTC

market, we find that firms in the OTC market report more zeros in the second digit of CFO than firms listed in the three major stock exchanges (12.01% vs. 13.35%), and this difference of 1.34% is statistically significant at 1% level (Z stats = 7.69). These results provide evidence in support of H2 that the round-up of CFO is more severe for firms listed in the OTC market than for firms listed in the three major stock exchanges.

TABLE 3 FREQUENCY DISTRIBUTIONS OF SECOND DIGITS IN ANNUAL POSITIVE CASH FLOW FROM OPERATION (CFO) FOR ALL FIRMS LISTED IN THREE MAJOR STOCK EXCHANGES AND THE OTC MARKET

Panel A: Distributions of second digits in annual CFO for All firms (176,256 observations)

	0	1	2	3	4	5	6	7	8	9
CFO	12.39	11.30	10.80	10.37	10.07	9.65	9.38	8.98	8.72	8.35
Deviation	0.42	-0.09	-0.08	-0.06	0.04	-0.02	0.04	-0.06	-0.04	-0.15
Zstatistics	***5.41***	*1.22*	*1.05*	*0.89*	*0.49*	*0.31*	*0.62*	*0.89*	*0.64*	***2.20***

Panel B: Distributions of second digits in annual CFO for firms listed in three major stock exchanges (126,394 observations)

		0	1	2	3	4	5	6	7	8	9
CFO	12.01	11.26	10.85	10.41	10.15	9.69	9.42	9.02	8.81	8.37	
Deviation		0.04	-0.13	-0.03	-0.02	0.12	0.02	0.08	-0.02	0.05	-0.13
Zstatistics		*0.43*	*1.40*	*0.28*	*0.25*	*1.47*	*0.28*	*0.96*	*0.28*	*0.59*	*1.63*

Panel C: Distributions of second digits in annual CFO for the OTC firms (49,862 observations)

	0	1	2	3	4	5	6	7	8	9	
CFO	13.35	11.38	10.67	10.26	9.84	9.53	9.29	8.88	8.49	8.31	
Deviation		1.38	-0.01	-0.21	-0.17	-0.19	-0.14	-0.05	-0.16	-0.27	-0.19
Zstatistics		***9.49***	*0.05*	*1.52*	*1.26*	*1.41*	*1.03*	*0.35*	*1.22*	*2.14*	*1.52*

Panel D: Comparison of the distributions of second digits in CFO between OTC firms and firms listed in three major stock exchanges

	0	1	2	3	4	5	6	7	8	9	
Difference		1.34	0.12	-0.19	-0.15	-0.32	-0.16	-0.13	-0.13	-0.32	-0.06
Zstatistics		***7.69***	*0.69*	*1.13*	*0.93*	*1.97*	*1.02*	*0.80*	*0.88*	*2.14*	*0.42*

As discussed earlier, since loss firms have more incentives to round-up operating cash flows than profit firms, we further partition both the three major stock exchange sample and the OTC sample into profit-firm and loss-firm subsamples and examine the magnitude of the round-up of CFO for profit firms and loss firms separately, expecting the round-up of CFO to be more severe for loss firms than for profit firms. Table 4 reports results for firms in the three major stock exchanges and Table 5 report results for firms in the OTC market. As shown in Panel A of Table 4, in the three major stock exchanges, 12.05% of profit firms report zero in the second digit of cash flow; compared to the expected frequency of 11.97%, the 0.08% difference is not statistically significant (Z stats = 0.08). As shown in Panel B, 11.84% of loss firms report zero in the second digit of cash flow; compared to the expected frequency of 11.97%, the -0.13% difference is not statistically significant (Z stats = 0.59). As shown in Panel C, the difference in the magnitude of round-up by profit and loss firms of 0.20% is not statistically significant (Z stats = 0.86). These results suggest that firms listed in the three major stock exchanges do not round-up cash flows, even for loss firms, where the incentive to round-up is very high. This maybe likely due to the difficulty to round-up operating cash flows for firms listed in the three major stock exchanges, where the rules

and regulations governing the disclosure requirement is strict. To further investigate, we examine the round-up of CFO by profit firms and loss firms listed in the OTC market, where the rules and regulations are much weaker and report the results in Table 5.

TABLE 4 FREQUENCY DISTRIBUTIONS OF SECOND DIGITS IN POSITIVE ANNUAL CASH FLOW FROM OPERATIONS (CFO) FOR FIRMS LISTED IN THE THREE MAJOR STOCK EXCHANGES (NYSE, AMSE, NASDAQ)

Z statistics	*0.86*	*0.28*	*1.72*	*1.53*	*1.22*	*0.70*	*0.87*	*0.73*	*1.96*	*0.67*

Panel A: Distributions of second digits in annual CFO for profit firms (102,979 observations)

	0	1	2	3	4	5	6	7	8	9
CFO	12.05	11.28	10.78	10.34	10.10	9.67	9.45	9.05	8.88	8.40
Deviation	0.08	-0.11	-0.10	-0.09	0.07	0.00	0.11	0.01	0.12	-0.10
Z statistics	*0.76*	*1.14*	*1.00*	*0.89*	*0.80*	*0.05*	*1.25*	*0.06*	*1.38*	*1.18*

Panel B: Distributions of second digits in annual CFO for loss firms (23,415 observations)

	0	1	2	3	4	5	6	7	8	9
CFO	11.84	11.21	11.17	10.69	10.37	9.82	9.27	8.89	8.48	8.26
Deviation	-0.13	-0.18	0.29	0.26	0.34	0.15	-0.07	-0.15	-0.28	-0.24
Z statistics	*0.59*	*0.85*	*1.43*	*1.27*	*1.74*	*0.76*	*0.37*	*0.78*	*1.52*	*1.31*

Panel C: Comparison of the distributions of second digits in CFO between profit firms and loss firms

	0	1	2	3	4	5	6	7	8	9
Difference	0.20	0.07	-0.39	-0.34	-0.27	-0.15	0.19	0.15	0.40	0.14

As shown in Table 5 Panel A, in the OTC market, 12.33% of profit firms report zero in the second digit of cash flow from operations; compared to the expected frequency of 11.97%, the 0.36% deviation is statistically significant at 5% level (Z stats = 2.04). As shown in Panel B, 15.40% of loss firms report zero in the second digit of cash flow; compared to the expected frequency of 11.97%, the deviation of 3.43% is statistically significant at 1% level (Z stats = 13.58). Lastly, we compare the difference in the magnitude of round-up for profit firms and loss firms and report the results in Panel C. As shown in Panel C, loss firms report a higher frequency of zero in the second digit than profit firms (15.40 vs. 12.33) and this difference of 3.07% is statistically significant at 1% level (Z stats = 9.47). Overall, results in Table 5 provide evidence for H3 that loss firms have stronger incentives to round-up CFO than profit firms and the magnitude of round-up is higher for loss firms than for profit firms.

CONCLUSION

Both earnings and cash flow from operations (CFO) are important determinants of firm value. Firm managers have incentives to round-up both metrics to paint a rosy picture of firm performance. However, although prior studies have provided extensive evidence on the rounding phenomenon in earnings, no study has examined whether firms also round-up CFO. In this study, we examine the rounding phenomenon in reported cash flow from operations (CFO), filling an important gap in the rounding phenomenon literature.

We examine the round-up of CFO by firms listed in the three major stock exchanges and firms listed in the OTC market separately, because firms in the OTC market faces less strict disclosure requirement and therefore have more opportunities to round-up CFO than firms in the major three stock exchanges. We also examine the round-up of CFO by profit firms and loss firms separately, because loss firms have more incentives to round-up CFO

than profit firms. We find that firms listed in the major three stock exchanges round-up earnings, but they do not round-up CFO. In contrast, firms listed in the OTC market round-up both earnings and CFO. We also find that in the OTC market, both profit firms and loss firms round-up CFO, but the magnitude of round-up is much higher for loss firms than for profit firms. Overall, these results provide consistent evidence that although firms have incentives to round up both earnings and CFO to paint a rosy picture of the firms' performance, it is more difficult to round-up CFO than to round-up the accrual component of earnings. As a result, in an environment where the regulation and disclosure requirement is stricter (i.e., in the three major stock exchange), firms do not have as much opportunities to round-up CFO; while in an environment where the regulation and disclosure requirement is less strict (i.e., in the OTC market), firms do round-up CFO, and the magnitude of round-up is more severe for loss firms than for profit firms.

Even though this study empirically documented firms' rounding of CFO in the OTC market, it remains unexplored the exact approaches firms take to round-up CFO. This is an interesting research question to be examined by future studies.

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