On Alternative Measures of Accruals

Linna Shi and Huai Zhang

Abstract

This paper investigates the difference between two widely used measures of accruals and their differential impact on accrual strategy returns. The two measures are accruals computed using consecutive changes in the balance sheet items and accruals computed as earnings minus cash flows from operating activities, both from the cash flow statement. Our investigations reveal that the difference between the two measures is caused by four items and non-articulations in changes in working capital accounts and depreciation expenses, in addition to non-articulation events as identified by Hribar and Collins (2002). We find that the non-articulation in working capital accounts and depreciation expenses between the cash flow statement and other financial statements is surprisingly prevalent and economically significant, and it can be attributed to special events, errors made by Compustat, firms' inconsistent definitions and non-standard classifications of assets/liabilities. We show that, after excluding non-articulation events, the accrual strategy returns are higher for accruals computed using balance sheet items than accruals computed using cash flow statement items. Further investigations suggest that the return differentials are mainly due to other funds from operations and the non-articulation in changes in accounts receivable.

I. INTRODUCTION

Sloan (1996) finds that the hedge portfolio with a long position in low accrual firms and a short position in high accrual firms generates positive abnormal returns. This finding is commonly referred to as "the accrual anomaly". Many subsequent papers have attempted to explain the accrual anomaly or explore whether this finding holds in different settings. In most such studies, accounting accruals are computed either using consecutive changes in the balance sheet items (*ACCR_BS*) or using earnings minus cash flows from operating activities with both data items from the cash flow statement (*TACCR_CF*). For example, Xie (2001), Thomas and Zhang (2002), Fairfield et al. (2003), Richardson et al. (2005), Mashruwala et al. (2006), Pincus et al. (2007), Zhang (2007) and Wu et al. (2010) tabulate their results using mainly the balance sheet accruals, while Collins and Hribar (2000), Cheng and Thomas (2006), and Core et al. (2006) tabulate their results using mainly the cash flow statement accruals.

The popularity of the two accrual measures motivates us to investigate the differences between the two accrual measures and their differential impact on the accrual strategy return. We deem our paper an extension of Hribar and Collins (2002) (HC thereafter), who identify non-articulation events, such as mergers and acquisitions, as one cause of the difference between the balance-sheet-based and cash-flow-statement-based accrual measures. HC demonstrate convincingly that non-articulation events introduce significant measurement errors to balance-sheet accruals. All their tabulated results are based on a cash-flow-statement *operating* accrual measure (*ACCR_CF*), computed using the same formula for the balance-sheet accrual measure, with all data items from the cash flow statement. The accrual measure that we focus on, *TACCR_CF*, is labeled as cash-flow-statement *total* accruals in HC, and

HC acknowledge that its difference from the balance-sheet accruals is attributable to factors other than non-articulation events. We identify these factors and assess their importance in explaining the difference. To ensure that our results are not driven by non-articulation events, we exclude observations affected by those events from our sample.

The first factor we identify is the additional accrual components included in *TACCR_CF* but excluded from *ACCR_BS*. For illustration purposes, we recall the steps of the indirect method used to prepare the statement of cash flows. We begin with net income number. Step 1 is to adjust for non-cash expenses (revenues). A common non-cash expense is depreciation. Step 2 is to adjust for changes in current assets and current liabilities. Step 3 is to adjust for non-operating gains/losses. We then obtain operating cash flow. *ACCR_BS* considers the adjustments in Step 1 and 2 but not the adjustments in Step 3, while *TACCR_CF*, computed as net income minus operating cash flows, considers adjustments in all three steps. It is thus quite obvious that non-operating gains/losses constitute the additional accrual items included in *TACCR_CF* but excluded from *ACCR_BS*. Using the Compustat manual, we identify four such accrual items: deferred income tax benefit/expense (*DEF_TAX*), equity in net earnings/losses (*EQU_GL*), gains/losses from sales of *PPE* and investments (*PPE_GL*), and other funds from operations (*OF*). We define the four items so that a positive value indicates a higher *TACCR_CF* relative to *ACCR_BS*.

DEF_TAX represents deferred income tax benefit or expense reported in the operating activities section of the statement of cash flows. It takes negative value (i.e., *deferred income tax expense)* when income tax expense is larger than income tax payable and positive value (i.e., *deferred income tax benefit)* when income tax payable is larger than income tax expense. *EQU_GL* represents an adjustment to

2

income before extraordinary items and discontinued operations. It reflects the unremitted portion of an unconsolidated subsidiary's earnings included in the income statement less any dividends paid by the subsidiary. This item includes (1) Distributions from unconsolidated affiliates/joint ventures, and (2) Dividends in excess of equity in earnings. *PPE_GL* represents losses and gains resulting from the sale, disposal, or retirement of assets. *OF* represents items not specifically included in another category within the operating activity section of the statement of cash flows. This item includes (1) Accretion; (2) Amortization of goodwill on unconsolidated subsidiaries; (3) Amortization of negative intangibles; (4) Depreciation of liability and equity accounts; (5) Equity related items when the change affects the Income Statement and not the Balance Sheet; (6) Minority interest (reported in operations) if the amount does not tie out to the Balance Sheet change; (7) Negative depreciation and amortization costs; (8) Losses (gains) on sale of property, plant, and equipment (*PPE*) reported within the Operations section (prior to 1987); (9) Provision for losses on accounts receivable; (10) Reorganization costs; (11) Special items; (12) Unrealized gains (losses) on sale of *PPE* (beginning in 1987); and (13) Writedowns, write-offs and impairments in value assets. According to Compustat's definition of Special Items, both *PPE_GL* and *OF* are likely included as part of it.

The difference between *ACCR_BS* and *TACCR_CF* does not stop here. We find that other than additional accrual items and non-articulation events, there are non-articulations in changes in working capital accounts and depreciation expenses between the cash flow statement and other financial statements. In theory, in a sample without non-articulation events, the values of changes in working capital accounts should be the same across the cash flow statement and the balance sheet, while the values for depreciation expenses should be the same across the cash flow statement

and the income statement. For example, changes in accounts receivable reported on the cash flow statement should be equal to consecutive changes in accounts receivable as reported on the balance sheet. Surprisingly, we find that this is not true for the majority of our sample firms: non-zero differences exist for 60 percent of our sample observations. In terms of magnitude, we show that the mean absolute value of the sum of the non-articulations is about 6.4 percent of the average total assets. The prevalence and economic significance of the non-articulations highlight the complexity in corporate financial reporting and warrant further investigations. To that end, we examine eight random observations with an overall non-articulation of substantial magnitude and six observations each for the non-articulations associated with changes in accounts receivable, changes in inventory, changes in accounts payable, changes in income tax payable, changes in other current assets/liabilities and depreciation expenses. Our investigations reveal that the non-articulation is due mainly to the following four reasons: 1) special events, such as write-offs and planned sales of assets; 2) errors made by Compustat in aggregating data; 3) firms' inconsistent definitions; and 4) non-standard classifications of assets/liabilities, such as long-term assets/liabilities included in the operating activities sections.

We next examine whether the accrual strategy return is different for the two accrual measures and how the differences between the two measures affect the return differentials. There are three reasons for conducting this analysis. First, it contributes to our understanding of the accrual anomaly, an intriguing topic in the accounting literature. We show that the balance sheet accrual measure yields higher accrual strategy returns and that the return differentials are mainly due to other funds from operations and the non-articulation in changes in accounts receivable. These findings highlight the importance of investigating accrual components (Thomas and Zhang

4

2002) and are useful to investors interested in applying the accrual strategy to stock trading. Second, Burgstahler et al. (2002) show that special items are mispriced to a lesser extent than other earnings components. However, exactly which line item drives this empirical finding is unclear. We address this gap in literature by pinpointing several line items likely classified as special items, such as other funds from operations, and by showing that including these line items leads to less mispricing of accruals. Third, the well-known finding in HC that non-articulation events introduce measurement errors to the balance-sheet accrual measure easily leads to the misconception that the accrual strategy return is weaker for the accrual measure based on the balance sheet items. Our return analysis helps to clarify this misconception by showing a stronger accrual strategy return based on the balance-sheet accrual, reinforcing the main message of the paper that the differences between the two accrual measures go well beyond non-articulation events.

Specifically, using a sample cleansed of the non-articulation events, we first analyze the accrual strategy return differentials between *ACCR_CF* and *TACCR_CF*. The four items (*DEF_TAX*, *EQU_GL*, *PPE_GL* and *OF*) that are included in *TACCR_CF* and excluded from *ACCR_CF* completely explain the difference between the two accrual measures. We find that the annual return to the accrual strategy is 7.0 percent, significant at the 0.05 level, for *ACCR_CF*, while it is 4.1 percent, not significant at the 0.10 level, for *TACCR_CF*. Among the four items, *OF* is mainly responsible for the return differentials, as it is mispriced to a significantly lesser extent than *ACCR_CF*. As *OF* is likely classified as special items, this finding is consistent with Burgstahler et al. (2002), who show that special items are mispriced to a lesser extent than other earnings components.

We then compare the accrual strategy return differentials between *ACCR_CF* and *ACCR_BS*. Non-articulations in working capital accounts and depreciation expenses completely explain the difference between these two accrual measures. We find that the accrual strategy return is 8.3 percent, significant at the 0.01 level, for *ACCR_BS*, while it is 7.0 percent, significant at the 0.05 level only, for *ACCR_CF*. Our further investigations provide some evidence that the return differential is mainly attributable to non-articulation in changes in accounts receivable.

Lastly, we compare the accrual strategy return differentials between *ACCR_BS* and *TACCR_CF*. We find that the accrual strategy return is much higher for *ACCR_BS* than for *TACCR_CF* (8.3 percent versus 4.1 percent). Consistent with prior results, we show that this return differential is mainly due to other funds from operations and the non-articulation in changes in accounts receivable, both mispriced to a significantly lesser extent than *ACCR_BS*.

Our paper contributes to the accounting literature in three ways. First, given that both accrual measures are widely used in the accounting literature, it is worth investigating what factors create the difference between the two measures. While HC identify non-articulation events as a cause of the difference, non-articulation events do not fully account for the difference. We address this gap in the literature. We show that the difference is due to non-articulation events, four accrual items and non-articulations in changes in working capital accounts and depreciation expenses between the cash flow statement and other financial statements. We believe that our paper provides a more comprehensive reconciliation between the two widely used accruals measures, which is informative to future academic studies using either or both of the two accrual measures.

Second, our investigation yields insights related to the articulation in accrual components between the cash flow statement and other financial statements. We find that the non-articulation is due to special events, errors made by Compustat, firms' inconsistent definitions and non-standard classifications of assets/liabilities. Our results thus contribute to the accruals-related literature in a more general sense.

Third, we examine how the accrual strategy return differs across the two accrual measures. We show that *ACCR_BS* yields higher accrual strategy returns than *TACCR_CF*. We find that one component of the cash-flow-statement accrual (other funds from operations) and the non-articulation in changes in accounts receivable are largely responsible for the differential accrual hedge returns. Our results contribute to a better understanding of the underlying mechanism of the accrual anomaly and highlight the importance of investigating accrual components (Thomas and Zhang 2002).

The rest of the paper is organized as follows. Section II discusses sample formation and variable measurement. Section III provides evidence on what causes the difference between the two accrual measures. Section IV investigates the differential accrual strategy returns, and Section V concludes.

II. SAMPLE FORMATION AND VARIABLE MEASUREMENT

Our sample consists of NYSE/AMEX/NASDAQ firms and covers the period between 1988 and 2007. We obtain financial statement data from Compustat and stock return data from CRSP.

Following previous literature, we compute the three accounting accrual measures as follows:

$$ACCR\_BS = \left[(\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD) - Dep \right] / Avass \qquad (1)$$

$$TACCR\_CF = (Earnings - CFO)/ Avass \qquad (2)$$

$$ACCR\_CF = (\Delta AR_{cf} + \Delta INV_{cf} - \Delta AP_{cf} - \Delta TP_{cf} + \Delta OT_{cf} - DEP_{cf})/Avass$$

$$(3)$$

where *ACCR_BS* is accruals computed using consecutive changes in the balance sheet data items; *ΔCA* is changes in total current assets (Compustat *ACT*); *ΔCash* is changes in cash and short-term investments (Compustat *CHE*); *ΔCL* is changes in total current liabilities (Compustat *LCT*); *ΔSTD* is changes in debt in current liabilities (Compustat *DLC*); *Dep* is depreciation and amortization expenses from the income statement (Compustat *DP*); *Avass* is average total assets (Compustat *AT*); *TACCR_CF* is the cash-flow-statement total accruals; *Earnings* is income before extraordinary items (Compustat *IBC*); *CFO* is net cash flow from operating activities (Compustat *OANCF*) minus extraordinary items and discontinued operations (Compustat *XIDOC*); *ACCR_CF* is the cash-flow-statement operating accruals. ΔAR_{cf} = Changes in accounts receivable from statement of cash flows (– Compustat *RECCH*); ΔINV_{cf} =Changes in inventories from statement of cash flows (– Compustat *INVCH*); ΔAP_{cf} = Changes in accounts payable from statement of cash flows (Compustat *APALCH*); ΔTP_{cf} = Changes in accrued income taxes from statement of cash flows (Compustat *TXACH*); ΔOT_{cf} =Net changes in other current assets and liabilities from statement of cash flows (– Compustat *AOLOCH*); DEP_{cf} = Depreciation and amortization from statement of cash flows (Compustat *DPC*).

Following Sloan (1996), we use size-adjusted returns to measure future abnormal returns. Size-adjusted return (SAR_{t+1}) represents the difference between the firm's buy-and-hold return and the buy-and-hold return on a value weighted portfolio of firms in the same CRSP size deciles. Size deciles are determined by the distribution of market values of all the NYSE/AMEX/NASDAQ firms at the beginning of the

calendar year. SAR_{t+1} is computed over the 12-month holding periods, beginning four months after current fiscal year end. Specifically, its computation follows the equation below.

$$SAR_{i,t+1} = \prod_s(1 + r_{it)} - \prod_s(1 + r_{pt)} \tag{4}$$

where r_{is} and r_{ps} are returns in month s for firm i and size portfolio p, respectively.

When a firm delists, we use the delisting return in the delisting month and assume a return equal to the firm's size-matched portfolio for the remainder of the year. If a firm's delisting is due to liquidation or a forced delisting and the delisting return is missing, the delisting return is set to -100 percent. This treatment is consistent with Sloan (1996).

Observations are deleted if (1) *ACCR_BS*, *TACCR_CF* or *SAR_{t+1}* is missing; (2) the firm is in the financial industry according to the SIC code (6000<=SIC<=6999); or (3) the book value of average total assets is less than $1 million.

Furthermore, we eliminate observations affected by the non-articulation events identified by HC (i.e., mergers and acquisitions, discontinued operations and foreign currency translations). HC provide evidence that the difference between the two accrual measures is partly attributable to those events. We eliminate those observations because we are interested in *other* factors that explain the difference between the two accrual measures.

We determine that a merger or acquisition takes place if any of the following conditions are met: a) the footnote of sales (Compustat *SALE_FN*) identifies the merger and acquisition activities; b) the absolute value of contributions of sales from acquisitions (Compustat *AQS*) is larger than $10,000; c) the absolute value of contributions of income from acquisitions (Compustat *AQI*) is larger than $10,000.

9

We determine that discontinued operations occur if any of the following conditions are met: a) the footnote of sales (Compustat *SALE_FN*) identifies discontinued operations; b) the absolute value of discontinued operations (Compustat *DO*) is larger than $10,000; c) the absolute value of long-term assets of discontinued operations (Compustat *ALDO*) is larger than $10,000; and d) the absolute value of current assets of discontinued operations (Compustat *ACDO*) is larger than $10,000. In addition, a firm-year observation is deleted if the firm reports a gain or loss from foreign currency translations (Compustat *FCA*) with a magnitude greater than $10,000. Our final sample includes 50,196 firm-year observations.

III. WHAT CAUSES THE DIFFERENCE?

This section identifies sources of the difference between *ACCR_BS* and *TACCR_CF*. The Compustat manual and prior academic research suggest that the difference is due to the following three reasons: (1) non-articulation events, such as mergers and acquisitions; (2) four items included in *TACCR_CF* but not in *ACCR_BS*; and (3) the non-articulation in changes in working capital accounts and depreciation expenses between the cash flow statement and other financial statements. Because HC have provided evidence related to non-articulation events, we focus on the second and third reasons.

The four items included in *TACCR_CF* but not in *ACCR_BS* are deferred income tax benefit/expense (*DEF_TAX*), equity in net earnings/losses (*EQU_GL*), gains/losses from sales of *PPE* and investments (*PPE_GL*), and other funds from operations (*OF*). These four items and the non-articulations in changes in working capital accounts and depreciation expenses are defined in so that a positive value indicates a higher *TACCR_CF* relative to *ACCR_BS*.

10

3.1 Descriptive Statistics

Table 1 reports the distribution of the four accrual items and non-articulations in our sample. The upper panel reports the four accrual items, while the lower panel reports non-articulations in changes in working capital accounts and depreciation expenses. All the mean and median values reported are significant at the 0.01 level, using a two-tailed *t* test.

Among the four items, we observe that *OF*, other funds from operations, is the most prevalent. In our sample, about 80.9 percent of observations have non-zero and non-missing values for *OF*.[1] *OF* is followed by *DEF_TAX*, deferred income tax benefit/expense (57.6 percent), and *PPE_GL*, gains/losses related to sales of PPE (44.7 percent). *EQU_GL*, equity in net earnings/losses, is the least prevalent, and only 11.4 percent of our sample observations have non-missing and non-zero values.

[Insert Table 1 here]

We then focus on the sample with non-missing and non-zero values to gauge the impact of each item on the difference between the two accrual measures. On average, *DEF_TAX* and *PPE_GL* lead to a higher *TACCR_CF* than *ACCR_BS*, evidenced by their positive mean values. In contrast, *EQU_GL* and *OF*, on average, lead to a lower *TACCR_CF* than *ACCR_BS*, because their mean values are negative. The sum of the four items has a negative mean value of 2.8 percent, indicating that in general, the combined effect of the four reduces *TACCR_CF* by 2.8 percent of average total assets. If we assume that firms on average have a return-on-assets of close to ten percent, the combined effect is about 28 percent of the reported earnings and is likely to be economically significant.

---

[1] We consider non-zero values because zero values will not lead to any difference between *TACCR_CF* and *ACCR_BS*.

When we turn to the absolute value of the four items, we find that the magnitude of *OF* is the highest among the four. On average, it has a mean value of 4.3 percent, which compares to 1.5 percent for *DEF_TAX*, 1.7 percent for *EQU_GL* and 1.3 percent for *PPE_GL*. The sum of the four items exhibits a magnitude of 4.6 percent of total assets, which is economically significant.

The lower panel reveals a somewhat surprising finding. We find that non-articulations in changes in working capital accounts and depreciation expenses are rather prevalent, although accounting textbooks prescribe identical values between the cash flow statement and other financial statements. For four out of the five working capital accounts we consider, the proportion of firms that show non-articulation is greater than 50 percent. This proportion is close to 41 percent for depreciation expenses. When we combine all of these non-articulation items, we find that about 60 percent of our sample firms are affected.

It is possible that some of the non-articulations we observe are due to rounding errors. For example, assume that the balance of accounts receivable is 4.5 million in year t and 3.4 million in year t-1. Due to rounding, the reported numbers for accounts receivable on the balance sheet are 5 million and 3 million respectively for the two years, exhibiting an increase of 2 million. Rounding also leads to the actual difference (1.1 million) being reported on the statement of cash flow as 1 million. Consequently, we observe a non-articulation of 1 million, though, in fact, the two statements articulate perfectly. Our example shows that rounding errors may be responsible for non-articulations with a magnitude of no greater than 1 million. While we recognize this possibility, we are unable to distinguish it from the alternative explanation that the amount of non-articulation is indeed small.

We use two approaches to assess the impact of rounding on the prevalence of non-articulations. The first approach makes the extreme and unrealistic assumption that all non-articulations with a magnitude of no greater than 1 million are due to rounding errors.[2] This assumption leads to the most conservative estimate of the prevalence of non-articulations. We observe that the proportion of firms with a non-articulation magnitude of greater than 1 million ranges between 5.81 percent for changes in income tax payable to 56.45 percent for changes in other current assets/liabilities. It is 37.66 percent for the overall non-articulation, suggesting that more than one-third of the firms in our sample exhibit non-articulations, even if we assume unrealistically that all non-articulations of no greater than 1 million are due to rounding.

The second approach recognizes a common size effect: small firms tend to have accounting numbers of lower magnitude, and non-articulations with a magnitude of less than 1 million may be explained by the small size of the firm. Thus, one way to detect whether non-articulations are driven by rounding errors is to relate the magnitude of the non-articulation to the firm size, assuming that the greater the magnitude of the non-articulation relative to firm size, the less likely the non-articulation is due to rounding errors. Following this reasoning, we report the proportion of firms with a non-articulation magnitude of greater than 0.1 percent, 0.5 percent and 1 percent of average total assets. For the overall non-articulations, the proportions are, respectively, 58.41 percent, 53.18 percent and 47.61 percent. If we assume that the non-articulations with a magnitude of greater than 1 percent of average total assets are not due to rounding errors, our results suggest that non-articulations exist for close to 50 percent of firms in our sample.

---

[2] Table 2 reports numerous cases where a non-articulation with a magnitude of around 1 million is not due to rounding errors.

After considering the prevalence of non-articulations, we next turn to the magnitude. An examination of the raw values, for those with non-zero values, suggests that on average, non-articulation in changes in accounts receivable, changes in inventory and changes in other current assets/liabilities lead to a higher *TACCR_CF* value relative to *ACCR_BS*, while the opposite is true for changes in accounts payable, changes in tax payable and depreciation expenses. The sum of all non-articulation items has a positive mean value, indicating that on average, the total leads to a higher *TACCR_CF* value than *ACCR_BS*.

The statistics related to the absolute value suggest that the effect of non-articulation in other current assets/liabilities has the greatest magnitude: in general, it affects about 3.6 percent of average total assets. The magnitude of the combined effect of all non-articulation items is about 6.4 percent of average total assets.

3.2. More on non-articulations

In theory, in a sample without non-articulation events, the values for changes in working capital accounts should be the same across the cash flow statement and the balance sheet, while the values for depreciation expenses should be the same across the cash flow statement and the income statement. Our previous analysis shows that this does not hold true for the majority of observations in our sample.

To understand how this non-articulation is created, we manually collect data from the firms' SEC filings. Specifically, we examine eight random observations with an overall non-articulation of substantial magnitude and six observations each for non-articulations associated with changes in accounts receivable, changes in inventory, changes in accounts payable, changes in income tax payable, changes in other current assets/liabilities and depreciation expenses. Among the six observations, three have a

small magnitude of non-articulations (around 1 million), and three have a greater magnitude (i.e., the magnitude is above the median of the sample). We report each observation's GVKEY, fiscal year and the reason for non-articulation in Table 2.

[Insert Table 2 here]

Panel A reports results related to the eight observations with overall non-articulations of substantial magnitude. The first observation is related to assets held for sale. The cash flow statement correctly adjusts for those assets, but the balance sheet does not. The second and third observations are related to write-off of inventory, which is reflected on the cash flow statement but not on the balance sheet. To summarize, all three of these observations are related to special events, such as selling of assets and inventory write-offs. The cash flow statement appropriately adjusts for these special events, while the balance sheet does not.

The next two observations are related to inconsistent definitions on the financial statements. In the fourth observation, the depreciation and amortization expenses as reported on the income statement include depreciations of PPE but exclude "promotional displays" or intangible assets, while the depreciation and amortization expenses on the cash flow statement include both. In the fifth observation, the income statement depreciation and amortization expenses exclude the write-off of abandoned and impaired assets, but the depreciation and amortization expenses reported on the cash flow statement include it.

The sixth observation reflects Compustat's error in calculating total accounts payable on the balance sheet. In 2003, the Compustat definition of accounts payable excludes accrued gas purchases and includes accrued imbalances payable, but in 2002, it includes accrued gas purchases and excludes accrued imbalances payable. In our

15

opinion, both should be included as accounts payable, which is the approach used in the cash flow statement.

The seventh and eighth observations are related to non-standard classifications of assets/liabilities. The accounting textbooks call for changes in current assets/liabilities to be included in the operating activities section, and for changes in long-term assets/liabilities to be included in either the investing or financing activities section. The realities are sometimes too complex for this prescription. Changes in accounts payable related to acquisitions of oil and gas properties are included in the cash flows from investing activities for the seventh observation, while deferred revenues classified as long-term liabilities on the balance sheet are included in the cash flows from operating activities for the eighth observation.

Panel B reports results on non-articulations in changes in accounts receivable. The main explanation for this type of non-articulation is Compustat errors, to which five out of the six observations can be attributed. We find no differences in the causes of non-articulations between observations with a small magnitude and those with a large magnitude of non-articulations.

Panel C reports results on non-articulations in changes in inventory. The main explanations for this type of non-articulation are special events and non-standard classifications of assets/liabilities. Specifically, we find that five out of the six observations are related to special events, such as write-off of inventory and change of accounting principles. The non-articulation in the remaining observation is due to a non-standard classification of assets/liabilities: long-term assets/liabilities are included in the operating section of the cash flow statement. The explanations for non-

articulations do not differ across observations with small and large magnitudes of non-articulations.

Panel D reports results associated with non-articulations in changes in accounts payable. Five out of the six observations are associated with Compustat error, while the remaining one is related to inconsistent definitions. We observe no difference in what causes the non-articulation across firms with small and large magnitudes of non-articulations.

Panel E reports the results of our comparison of changes in income tax payable (ΔITP) on the balance sheet with changes in accrued income taxes (ΔAIT) reported on the statement of cash flows. The latter is used as a counterpart of the former when HC compute the cash-flow-statement operating accruals. However, strictly speaking, these two items are not comparable. The Compustat manual definition indicates that ΔAIT differs from ΔITP due to AIT's inclusion of a) accrued taxes, b) deferred taxes and c) long-term income taxes payable. If any of the three items is non-zero, we expect a difference between the two. Our examination of the six observations indicates that all of the non-articulations can be explained by incomparable definitions.

Panel F reports results on non-articulations in changes in other current assets and liabilities. A variety of reasons can explain this type of non-articulation, including Compustat error, non-standard classifications of assets/liabilities and definition inconsistency.

Panel G reports results on non-articulations in depreciation and amortization expenses between the statement of cash flows and the income statement. All of them can be attributed to Compustat errors.

In sum, we find that main reasons for non-articulations are as follows: 1) Special events, such as write-off of inventory, sales of a subsidiary or changes in

17

accounting principles. Special events mainly affect non-articulations in inventory. 2) Non-standard classification of assets/liabilities. We find that accounting in the real world is more complex than what accounting textbooks prescribe. Specifically, we document that there are current assets/liabilities included in the investing or financing activities section and long-term assets/liabilities included in the operating activities section of the statement of cash flows. 3) Firms' inconsistent definitions. For example, an item may be excluded from depreciation expenses reported on the income statement and included in depreciation expenses reported on the cash flow statement. 4) Compustat error. Financial statements from different firms use different labels and different systems of categorization. Compustat often needs to exercise judgment when aggregating data, and this process is not immune to errors. For example, one item on the balance sheet, which shall be included as part of accounts receivable, may be wrongly excluded by Compustat, resulting in a non-articulation. Compustat error is largely responsible for non-articulations in changes in accounts receivable, changes in accounts payable and depreciation/amortization expenses.

IV. THE DIFFERENTIAL ACCRUAL STRATEGY RETURN

4.1. Regression analysis methodology

We next investigate whether the accrual strategy return differs across the two accrual measures and how the differences between the two measures affect the return differentials.

As we discussed earlier, the difference in values between the two popular accrual measures ($ACCR\_BS$ and $TACCR\_CF$) can be attributed to three sources: (1) non-articulation events, such as mergers and acquisitions; (2) four items included in

TACCR_CF but not in *ACCR_BS*; and (3) the non-articulation in accrual components between the cash flow statement and other financial statements.

HC provide convincing evidence related to the first source, non-articulation events. They find that measurement errors caused by non-articulation events reduce the accrual strategy return based on the balance-sheet operating accruals. However, they are silent on how the second and third sources, i.e., the four items and non-articulations in working capital accounts, affect the return differentials. We address this gap in prior literature.

Our empirical analysis requires the following variables to be non-missing: *ACCR_BS, ACCR_CF, TACCR_CF, DEF_TAX, EQU_GL, PPE_GL,* and *OF*. The additional data requirement reduces the sample size to 27,200 observations. Our analysis involves three steps. The first step considers the impact of four items, the second step the impact of non-articulations and the third step the impact of both the four items and the non-articulations. In our analysis, we use the cash flow statement operating accrual (*ACCR_CF*), the main accrual measure in HC, for the following two reasons. First, the accounting literature has used three accrual measures (*ACCR_BS*, *ACCR_CF*, and *TACCR_CF*), and it would be interesting to see which accrual measure leads to the strongest accrual anomaly.[3] Second, the difference between *ACCR_BS* and *ACCR_CF* is due to structural changes and non-articulations, while the difference between *ACCR_CF* and *TACCR_CF* arises from the four items included in *TACCR_CF*. To the extent that the structural changes and non-articulations can be viewed as measurement errors and the four items can be viewed as special items, our analysis helps to determine how measurement errors and special items in accruals affect the magnitude of the accrual anomaly.

---

[3] To the best of our knowledge, HC is the only paper that uses *ACCR_CF* as the main variable of interest. The unpopularity of this measure is probably due to the stringent data requirement. For example, requiring this variable alone reduces our sample size by 22,996.

Our analysis employs a regression approach, which can be used to understand the differential accrual strategy returns based on any two accrual measures. We first regress next year size-adjusted returns on the two accrual measures separately to determine which accrual measure generates a lower accrual strategy return. Let's assume that $ACCR\_L$ generates a lower accrual strategy return than $ACCR\_H$ does. Further assume that there are n items included in $ACCR\_L$ but not in $ACCR\_H$: $X1$, $X2$...and Xn, so that the following equation holds:

$$ACCR\_L = ACCR\_H + X1 + X2 + \cdots + Xn \tag{5}$$

We run the following regression to shed light on how the n items affect the return differentials.[4]

$$SAR_{t+1} = \beta_0 + \beta_1 * ACCR\_L + \beta_2 * X1 + \beta_3 * X2 + \cdots . \beta_{n+1} * Xn + e_{t+1}$$

$$\tag{6}$$

If a specific item, such as $X1$, does not affect the correlation between $ACCR\_L$ and future stock returns, then the coefficient on it should be insignificant. If $X1$ is responsible for the lower predictive ability of $ACCR\_L$ relative to $ACCR\_H$ for future abnormal returns, we expect the coefficient on $X1$ to be positive. To see this point, we plug Equation (5) into Equation (6) and have the following:

$$SAR_{t+1} = \beta_0 + \beta_1 * ACCR\_L + \beta_2 * X1 + \beta_3 * X2 + \ldots + \beta_{n+1} * Xn + e_{t+1}$$

$$= \beta_0 + \beta_1 * (ACCR\_H + X1 + X2 + \cdots + Xn)$$

$$+ \beta_2 * X1 + \beta_3 * X2 + \ldots + \beta_{n+1} * Xn + e_{t+1}$$

$$= \beta_0 + \beta_1 * ACCR\_H + (\beta_1 + \beta_2) * X1 + (\beta_1 + \beta_3) * X2$$

$$+ \cdots + (\beta_1 + \beta_{n+1}) * Xn + e_{t+1} \tag{7}$$

In Equation (7), we expect the coefficient on $ACCR\_H$ to be negative and significant, given the finding in Sloan (1996). If β_2 is positive and significant, it shows that the predictive power for future abnormal returns is weaker for $X1$ than for

---

[4] We would like to thank an anonymous referee for suggesting this approach.

ACCR_H, implying that *X1*, which is included in *ACCR_L* but not in *ACCR_H*, is responsible for the lower association between *ACCR_L* and future abnormal returns.

This regression model offers the following three advantages. First, it does not exclude any observation, while the portfolio analysis effectively relies on observations in the bottom and top deciles only. Second, it summarizes the impact of each of the items in the model. Finally, it can easily be modified to test the cumulative effect of *X1, X2, ...* and *Xn*.[5] For example, to test the cumulative effect of *X1* and *X2*, we can simply run the following regression and examine β_2, the coefficient on (*X1+X2*).

$$SAR_{t+1} = \beta_0 + \beta_1 * ACCR\_L + \beta_2 * (X1 + X2) + \beta_3 * X3$$
$$+ \cdots \beta_n * Xn + e_{t+1} \qquad (8)$$

4.2. The impact of four items

This section analyzes the impact of the four items included in *TACCR_CF* but not in *ACCR_CF*. We first regress size-adjusted returns on the two accrual measures independently. We run regressions annually and report the mean value of annual coefficient estimates. The statistically significant level is based on the distribution of annual coefficient estimates. This Fama-MacBeth type of regression controls for the cross-sectional correlation in residuals. Our regression results are reported under Regression 1 and Regression 2 in Table 3. Panel A reports results based on the raw values, and Panel B reports results based on the decile ranks. The deciles are formed annually, and the values of the decile ranks range from 0 (the lowest decile) to 1 (the highest decile). The coefficient on the decile rank thus reflects the return to the hedge

---

[5] It is not clear what causes the accrual anomaly. Fairfield et al. (2003) and Zhang (2007) find evidence consistent with the notion that the accrual anomaly is a special case of a more general growth anomaly. The balance-sheet accrual may measure growth better, because, relative to the cash-flow accrual, it is higher for firms involved in M&A (an indication of high growth) and lower for firms involved in discontinued operations (an indication of low and negative growth). If what investors really misprice is the growth, the balance-sheet accrual may yield a higher accrual strategy return because it better represents growth.

portfolio with a long position in the top deciles and a short position in the bottom deciles of the accrual measure. In both panels, a more negative coefficient on the accrual measure reflects a higher accrual strategy return.

[Insert Table 3 here]

Panel A provides evidence that *ACCR_CF* generates higher accrual strategy returns: the coefficient on *ACCR_CF* is negative and significant at the 0.10 level, while that on *TACCR_CF* is positive and insignificant. Similar evidence appears in Panel B: the coefficient on the decile rank of ACCR_CF is -0.07, significant at the 0.05 level, while the coefficient on the decile rank of TACCR_CF is -0.041, not significant at the 0.10 level. In sum, our results in Table 3 suggest that the cash flow operating accruals generate higher accrual strategy returns than the cash flow total accruals.

We then analyze the impact of the four items on the return differentials. Following the methodology discussed in Section 4.1, we regress size-adjusted returns on *TACCR_CF* and (the sum of) the four items. Our results are reported under Regression 3 and Regression 4 in Table 3.

Given that the four items completely explain the difference between the two measures, it is not surprising to observe that the coefficient on the sum of the four items is positive and significant in both Panel A and Panel B, suggesting that the return differentials are due to the sum of the four items. What is more interesting is that among the four items, only one item, other funds from operations, has a positive and significant coefficient, in both Panel A and Panel B. Specifically, the coefficient on *OF* is 0.259, significant at the 0.05 level in Panel A, and it is 0.119, significant at the 0.05 level in Panel B. The coefficients on the remaining four items are insignificant in both panels. Our result thus suggests that other funds from operations

22

(*OF*) is mispriced to a significantly lesser extent than *ACCR_CF* and is responsible for the return differentials between *TACCR_CF* and *ACCR_CF*. To the extent that *OF* is classified as special items, our finding is consistent with that of Burgstahler et al. (2002), who show that special items are mispriced to a lesser extent than other earnings components.

4.3. The impact of non-articulations

This section analyzes the impact of non-articulations, which completely explain the difference between *ACCR_BS* and *ACCR_CF*. We first regress size-adjusted returns on the two accrual measures independently. After documenting that the accrual strategy return is higher for *ACCR_BS*, we regress size-adjusted returns on *ACCR_CF* and (the sum of) non-articulations. We run a Fama-MacBeth type of regression, and our results appear in Table 4. Panel A reports results based on the raw values, while Panel B reports results based on the decile ranks, whose values range from 0 to 1.

[Insert Table 4 here]

Both panels show that the accrual strategy return based on *ACCR_BS* is higher than that based on *ACCR_CF*. The Regression 1 and Regression 2 columns in Panel A show that the coefficient on *ACCR_BS* is -0.119, significant at the 0.05 level, while the coefficient on *ACCR_CF* is -0.107, significant at the 0.10 level but not at the 0.05 level. The Regression 1 and Regression 2 columns in Panel B report similar results: the coefficient on *ACCR_BS* is -0.083, significant at the 0.01 level, while the coefficient on *ACCR_CF* is -0.07, significant at the 0.05 level but not at the 0.01 level.

23

In conclusion, our results show that the accrual strategy return is higher for *ACCR_BS* than for *ACCR_CF*. [6]

The Regression 3 columns in both Panel A and Panel B show that the sum of all non-articulations is not helpful in explaining the return differentials between *ACCR_CF* and *ACCR_BS*, as the coefficient on the sum is insignificant.

The Regression 4 column reports the results related to non-articulations in accrual components. The coefficient on *DIF_AR* is 0.267, significant at the 0.05 level in Panel A; it is 0.056, not significant in Panel B. The coefficients on the rest of the non-articulations are insignificant in both panels. Our results thus provide some evidence that the non-articulation in changes in accounts receivable explains the return differentials between *ACCR_BS* and *ACCR_CF*.

4.4. The impact of both the four items and the non-articulations

This section analyzes the impact of both the four items and the non-articulations on the return differentials between *ACCR_BS* and *TACCR_CF*, the two most popular measures in the accounting literature. We first regress size-adjusted returns on the two accrual measures independently. Next, we regress size-adjusted returns on *TACCR_CF*, the four items and non-articulations in accrual components. Table 5 reports our results. Panel A reports results based on raw values, while Panel B reports results based on decile ranks, whose values range from 0 to 1.

[Insert Table 5 here]

The Regression 1 and Regression 2 columns report results from univariate regressions. We observe that *ACCR_BS* generates significantly higher accrual strategy

---

[6] This evidence is seemingly inconsistent with the finding in HC. Our further investigations show that the inconsistency is related to the different sample period: we are able to replicate their finding if we use their sample period.

returns.[7] Specifically, Panel A shows that *TACCR_CF* is insignificantly correlated with future returns, while the coefficient on *ACCR_BS* is -0.119, significant at the 0.05 level. Panel B reveals that the coefficient on the decile rank of *ACCR_BS* is -0.083, significant at the 0.01 level. This compares to the coefficient on the decile rank of *TACCR_CF*, which is -0.041 and not significant at the 0.10 level.

The Regression 3 column in both panels shows that when we consider the sum of four items and sum of non-articulations, the coefficient on the former is positive and significant at the 0.05 level, while the coefficient on the latter is insignificant. This finding suggests that, taken as a whole, the four items are responsible for the accrual strategy differentials.

The Regression 4 column reports results from the regression model that includes the four individual items and non-articulations. We find that, consistent with prior results, the return differentials are mainly attributable to other funds from operations and the non-articulation in changes in accounts receivable. In both panels, only these two variables take on positive and significant coefficients; the rest of the variables are not significant at the 0.10 level.

Overall, results in Table 5 indicate that non-articulations in changes in accounts receivable and other funds from operations are the main reasons behind the accrual strategy return differentials.

V. CONCLUSIONS

Since Sloan (1996), most accruals-related studies have focused on the relationship between accruals and future returns and use two approaches to estimate accruals. One is based on consecutive changes in the balance sheet items (*ACCR_BS*),

---

[7] The four items and non-articulations in changes in working capital accounts and depreciation expenses are defined so that Equation (5) holds.

and the other approach calculates accruals as earnings minus cash flows from operating activities, with both items reported on the cash flow statement (*TACCR_CF*). This paper examines two research questions: 1) what leads to the difference between the two accrual measures, and 2) how is the accruals strategy return affected by these differences?

We document that the difference between these two measures occurs for the following three reasons: 1) non-articulation events as identified by HC, 2) four items included in *TACCR_CF* but excluded from *ACCR_BS* and 3) non-articulations in changes in working capital accounts and depreciation expenses between the cash flow statement and other financial statements, which is surprisingly prevalent and economically significant.

We continue to investigate the differential impact of the two measures on the accrual strategy return. We find that *ACCR_BS* generates significantly higher returns than *TACCR_CF*. This return differential seems to be caused by non-articulations in changes in accounts receivable and other funds from operations.

In sum, our paper provides a more comprehensive reconciliation between the two widely used accruals measures, which is informative to future academic studies using either or both of the two accrual measures.

REFERENCES

Burgstahler, D. C., Jiambalvo, J., and Shevlin, T., 2002. Do stock prices fully reflect the implications of special items for future earnings? *Journal of Accounting Research* 40, 585-612.

Cheng, C. S. Agnes, and Thomas, W. B., 2006. Evidence of the abnormal accrual anomaly incremental to operating cash flows. *The Accounting Review* 81, 1151-1167.

Collins, D. W., and Hribar, P., 2000. Earnings-based and accrual-based anomalies: One effect or two? *Journal of Accounting and Economics* 29, 101-123.

Core, J. E., Guay, W. R., Richardson, S. A., and Verdi, R. S., 2006. Stock market anomalies: What can we learn from repurchases and insider trading? *Review of Accounting Studies* 11, 49-70.

Fairfield, P. M., Whisenant, J. S., and Yohn, T. L., 2003. Accrued earnings and growth: Implications for future profitability and market mispricing. *The Accounting Review* 78, 353-371.

Hribar, P., and Collins, D. W., 2002. Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40, 105-134.

Mashruwala, C. A., Rajgopal, S., and Shevlin, T. J., 2006. Why is the accrual anomaly not arbitraged away? The role of idiosyncratic risk and transaction costs. *Journal of Accounting and Economics* 42, 3-33.

Pincus, M., Rajgopal, S., and Venkatachalam, M., 2007. The accrual anomaly: International evidence. *The Accounting Review* 81, 169-204.

Richardson, S. A., Sloan, R. G., Soliman, M. T., and Tuna, I., 2005. Accrual reliability, earnings persistence, and stock prices. *Journal of Accounting and Economics* 39, 437-485.

Sloan, R. G., 1996. Does stock price fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71, 289-315.

Thomas, J., and Zhang, H., 2002. Inventory changes and future returns. *Review of Accounting Studies* 7, 163-187.

Wu, G., Zhang, L., and Zhang, X. F., 2010. The q-theory approach to understanding the accrual anomaly. *Journal of Accounting Research* 48, 177-223.

Xie, H., 2001. Are discretionary accruals mispriced? A reexamination. *The Accounting Review* 76, 357-373.

Zhang, X. F., 2007. Accruals, investments, and accrual anomaly. *The Accounting Review*.

APPENDIX:
Definition of key variables

SAR_{t+1} = Size adjusted returns computed using the following formula: $SAR_{i,t+1} = \prod_s(1 + r_{it)} - \prod_s(1 + r_{pt})$, where r_{is} and r_{ps} are returns in month s for firm i and size portfolio p respectively. Size deciles are determined by the distribution of the market values of all the NYSE/AMEX/NASDAQ firms at the beginning of the calendar year. *SAR* is computed over the 12-month holding periods, beginning four months after the fiscal year end. When a firm delists, we use the delisting return in the delisting month and assume a return equal to the firm's size-matched portfolio for the remainder of the year. If a firm's delisting is due to liquidation or a forced delisting and the delisting return is missing, the delisting return is set to -100 percent.

ACCR_BS = Accruals calculated using balance sheet items according to the following formula:
$ACCR\_BS = \{(\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD) - Dep\}/Avass$
where ΔCA = change in total current assets (Compustat *ACT*); $\Delta Cash$ = change in cash and short-term investments (Compustat *CHE*); ΔCL = change in total current liabilities (Compustat *LCT*); ΔCA = change in debt in current liabilities (Compustat *DLC*); Dep = depreciation and amortization from the income statement (Compustat *DP*); and $Avass$ = average total assets (Compustat *AT*).

ACCR_CF = $(\Delta AR_{cf} + \Delta INV_{cf} - \Delta AP_{cf} - \Delta TP_{cf} + \Delta OT_{cf} - DEP_{cf})/$ $Avass$, where ΔAR_{cf} = Changes in accounts receivable from statement of cash flows (– Compustat *RECCH*); ΔINV_{cf} = Changes in inventories from statement of cash flows (– Compustat *INVCH*); ΔAP_{cf} = Changes in accounts payable from statement of cash flows (Compustat *APALCH*); ΔTP_{cf} = Changes in accrued income taxes from statement of cash flows (Compustat *TXACH*); ΔOT_{cf} = Net changes in other current assets and liabilities from statement of cash flows (– Compustat *AOLOCH*); DEP_{cf} = Depreciation and amortization from statement of cash flows (Compustat *DPC*); $Avass$ = Average total assets (Compustat *AT*).

TACCR_CF = Accruals calculated using statement of cash flows according to the following formula: $TACCR\_CF = (Earnings - CFO)/$ $Avass$, where $Earnings$ = income before extraordinary items (Compustat Statement of Cash Flows *IBC*); CFO = net cash flow from operating activities (Compustat *OANCF*) – extraordinary items and discontinued operations (Compustat *XIDOC*); and $Avass$ = average total assets (Compustat *AT*).

DEF_TAX	=	Deferred income taxes benefit (+) / expense (–), (– Compustat *TXDC*), scaled by *Avass*.
EQU_GL	=	Equity in net earnings (+) / losses (–) (– Compustat *ESUBC*), scaled by *Avass*.
PPE_GL	=	Sale of PPE and investments gains (+) / losses (–) (– Compustat *SPPIV*), scaled by *Avass*.
OF	=	Funds from operations – other, net inflow (+) / net outflow (–) (– Compustat *FOPO*), scaled by *Avass*.
Four_items	=	Sum of *DEF_TAX*, *EQU_GL*, *PPE_GL* and *OF*.
DIF_AR	=	Changes in accounts receivable from statement of cash flows (– Compustat *RECCH*) – Changes in accounts receivable in two consecutive years from balance sheet (Compustat *RECT*)
DIF_INV	=	Changes in inventories from statement of cash flows (– Compustat *INVCH*) – Changes in inventories in two consecutive years from balance sheet (Compustat *INVT*)
DIF_AP	=	– Changes in accounts payable from statement of cash flows (Compustat *APALCH*) + Changes in accounts payable in two consecutive years from balance sheet (Compustat *AP*)
DIF_TP	=	– Changes in accrued income taxes from the statement of cash flows (Compustat *TXACH*) + Changes in tax payable in two consecutive years from balance sheet (Compustat *TXP*)
DIF_OT	=	Net changes in other current assets and liabilities from statement of cash flows (– Compustat *AOLOCH*) – Changes in other current assets in two consecutive years from balance sheet (Compustat *ACO*) + Changes in other current liabilities in two consecutive years from balance sheet (Compustat *LCO*)
DIF_DEP	=	– Depreciation and amortization from statement of cash flows (Compustat *DPC*) + Depreciation and amortization from income statement (Compustat *DP*)
Non_articulations	=	*DIF_AR+DIF_INV+DIF_AP+DIF_TP+DIF_OT+DIF_DEP*

Table 1: Distribution of the four items and non-articulations in changes in current assets, current liabilities and depreciation expenses between the balance sheet and the cash flow statement in a sample without non-articulation events, 50,196 obs.

Panel A: Four items

	Non-missing and non-zero obs.		Raw value (unit: %)					Absolute value (unit: %)				
	#	%	Mean	Std	Q1	Median	Q3	Mean	Std	Q1	Median	Q3
DEF_TAX	28,933	57.64	0.05	2.93	0.68	-0.06	-0.81	1.45	2.55	0.30	0.75	1.61
EQU_GL	5,712	11.38	-0.72	7.18	0.28	-0.02	-0.48	1.65	7.03	0.11	0.36	1.11
PPE_GL	22,429	44.68	0.69	5.86	0.30	0.01	-0.10	1.32	5.75	0.04	0.17	0.62
OF	40,618	80.92	-3.47	12.05	-0.11	-0.84	-3.14	4.32	11.77	0.36	1.13	3.60
Sum[1]	41,393	82.46	-2.82	12.38	0.14	-0.81	-2.98	4.55	11.85	0.52	1.46	3.95

Panel B: Non-articulations

	Non-missing and non-zero obs.		|DIF|> $1million	|DIF|> 0.1% of Avass	|DIF|> 0.5% of Avass	|DIF|> 1% of Avass	Raw value (unit: %)					Absolute value (unit: %)				
	#	%	%	%	%	%	Mean	Std.	Q1	Med.	Q3	Mean	Std.	Q1	Med.	Q3
DIF_AR	42,983	85.63	26.16	53.68	36.03	25.05	0.40	4.64	-0.09	0.00	0.54	1.48	4.41	0.01	0.31	1.26
DIF_INV	33,248	66.24	14.01	24.24	15.36	10.59	0.20	3.21	0.00	0.00	0.01	0.82	3.11	0.00	0.00	0.42
DIF_AP	39,648	78.99	35.20	69.62	54.74	41.59	-0.74	4.51	-1.66	-0.24	0.53	2.24	3.98	0.36	1.10	2.63
DIF_TP	11,317	22.55	5.81	10.14	5.56	3.26	-0.14	1.53	-0.15	0.00	0.01	0.53	1.45	0.00	0.05	0.49
DIF_OT	50,031	99.67	56.45	94.89	80.25	65.62	0.50	8.11	-1.21	0.34	2.26	3.63	7.27	0.67	1.76	4.04
DIF_DP	20,450	40.74	14.86	31.90	18.34	11.77	-1.34	3.94	-1.16	-0.39	-0.10	1.41	3.91	0.13	0.41	1.20
Sum[2]	30,220	60.20	37.66	58.41	53.18	47.61	2.67	12.67	-1.00	1.40	5.34	6.43	11.24	1.23	3.23	7.41

31

Notes:

50,196 firm-year observations without structural change events from NYSE/AMEX/NASDAQ markets for the period from 1988 to 2007. Observations are deleted if (1) *ACCR_BS*, *TACCR_CF* or *SAR*$_{t+1}$ is missing; (2) the firm is from the financial industry according to SIC code (6000<=SIC<=6999); or (3) the book value of average total assets is less than $1 million.

Sum[1]: Sum of the four items on the difference between *TACCR_CF* and *ACCR_BS*;

Sum[2]: Sum of all the non-articulation items on the difference between *TACCR_CF* and *ACCR_BS*;

Sum[3]: Sum of all the non-articulation items on the difference between *TACCR_CF* and *ACCR_BS*, with each difference of each component larger than $1million;

raw value and absolute value are calculated using non-missing and non-zero sample.

All the values are rounded to the second decimal. In particular, 0.00% does not mean exact zero; rather, it indicates a small number around zero.

Table 2: Investigation results on the non-articulations.

Panel A: Firms with non-articulations of substantial magnitude

Obs.	GVKEY	Fiscal year	REASON	DETAILS
1	65011	2000	Selling of a subsidiary	The SCF changes in current assets/liabilities adjust for the impact of the selling of a subsidiary, but the changes based on the B/S do not.
2	13765	2000	Write-off of inventory	The changes in inventory on the SCF are computed after adjusting for the write-off of inventory, but the changes based on the B/S are computed without such adjustment.
3	64223	2002	Write-off of inventory	The SCF changes in inventory adjust for the write-off of inventory, but the changes based on the B/S do not.
4	12379	2005	Definition inconsistency	The depreciation and amortization expenses as reported on the I/S include depreciations of PPE but not "promotional displays" and intangible assets, while the depreciation and amortization expenses on the SCF include both.
5	10296	2002	Definition inconsistency	The I/S depreciation and amortization expenses exclude the write-off of abandoned and impaired assets, but the depreciation and amortization expenses reported on the SCF include it.
6	150277	2003	Compustat error	Compustat does not calculate the total accounts payable correctly. In 2003, the Compustat accounts payable excludes accrued gas purchases but includes accrued imbalances payable. In 2002, it includes accrued gas purchases but excludes accrued imbalances payable. In our opinion, both should be included as accounts payable, which is the approach used on the SCF.
7	3594	2004	Current assets/liabilities not related to operating activities	Changes in accounts payable related to acquisitions of oil and gas properties are included in the investing activities on the SCF.
8	12250	2004	Long-term assets/liabilities related to operating activities	Deferred revenues which are classified as long-term liabilities on the B/S are included in the operating activities on the SCF.

33

Panel B: Firms with non-articulation in changes in accounts receivable

Obs.	GVKEY	Fiscal year	REASON	DETAILS
				Small difference of around $1 million
1	8293	2004	Compustat error	Compustat changes the classification of "Other receivables" from "Other current assets" to "Receivables" in B/S but does not make a similar change in SCF.
2	24205	2001	Definition inconsistency and Sales of A/R	(1) "Receivables from related parties" is part of "Accounts receivable" on B/S but not on SCF. (2) The increase in accounts receivable on SCF does not reflect the sale of the company's domestic trade accounts receivable, which was reflected in the B/S number.
3	64304	2004	Compustat error	Restated amount is reflected in SCF but not in B/S.
				Large difference
4	1581	1995	Compustat error	Compustat B/S receivables include both "accounts receivables" and "short-term finance receivables", but Compustat SCF includes only "changes in accounts receivables". Moreover, "provision for uncollectable" affects B/S number but not SCF number.
5	5606	2001	Compustat error	Compustat B/S receivables include both "accounts receivables, net" and "finance receivables, net", but Compustat SCF includes only "changes in accounts receivables". Moreover, "provisions for doubtful accounts" affects B/S number but not SCF number.
6	1690	2006	Compustat error	Compustat changes the classification of "Vendor non-trade receivables" from "Other current assets" to "Receivables" on B/S but not on SCF.

Panel C: Firms with the non-articulation in changes in inventory

Obs.	GVKEY	Fiscal year	REASON	DETAILS
				Small difference of around $1 million
1	62922	2006	Long-term assets/liabilities related to operating activities	B/S inventories include only items expected to sell in less than one year; SCF inventories include items expected to sell in more than one year.
2	64851	2005	Write-off of inventory	"Reserve for inventory obsolescence" and "prepaid inventory" affect B/S number but not SCF number.
3	11169	2004	Write-off of inventory	(1) "Costs and earnings in excess of billings" and "prepaid expense" are included as inventory in B/S but are not included as inventory in SCF. (2) "Provision for inventory reserves" affects B/S number but not SCF number.
				Large difference
4	20779	2001	Write-off of inventory	"Provision for inventory" affects B/S number but not SCF number.
5	13380	2005	Write-off of inventory	The write-down affects B/S number but not SCF number.
6	5606	2001	Change of accounting principle	The revaluation of inventory as a result of adopting the SEC's SAB101 affects the B/S number but not the SCF number.

Panel D: Firms with the non-articulation in changes in accounts payable

Obs.	GVKEY	Fiscal year	REASON	DETAILS
			Small difference of around $1 million	
1	62723	1996	Compustat error	"Accrued consulting fees" is included as part of accounts payable in SCF, but not in B/S.
2	117036	2000	Compustat error	"Accrued expenses" is included as part of accounts payable on SCF but not on B/S.
3	6116	1998	Definition inconsistency	The company changes its definition of accounts payable in 1998. This change affects the B/S number but not the SCF number.
			Large difference	
4	12206	2006	Compustat error	All "accounts payable" and "accrued liabilities" are considered in SCF but only a part of them are considered in B/S.
5	142953	2007	Compustat error	"Accrued products payable", "Accrued expense" and "Accrued interest" are included as part of Accounts Payable on SCF but not on B/S
6	1602	2006	Compustat error	"Other accrued liabilities" is included as part of accounts payable in SCF, but not on B/S.

Panel E: Firms with non-articulation in changes in income tax payable

Obs.	GVKEY	Fiscal year	REASON	DETAILS
				Small difference of around $1 million
1	2811	2001	Incomparable items	Compustat B/S income tax payable includes "current and deferred income taxes" but excludes "income tax receivable", while in SCF, change in accrued income tax refers to the net effects from both accounts.
2	30029	1999	Incomparable items	Compustat B/S income tax payable includes "income taxes" and excludes "prepaid taxes", while in SCF, change in accrued income tax refers to the net effects from both accounts.
3	25081	1999	Incomparable items	The company does not have "income tax payable"; instead it has "income taxes receivable". The change in income tax payable is zero on the B/S. The change in accrued income tax reported on SCF is non-zero because it refers to the changes in income tax receivable.
				Large difference
4	20779	2007	Incomparable items	(1) Company reports "excess tax benefits from share-based compensation" in SCF separately from "changes in income tax payable", while in B/S, both affect income tax payable. (2) SCF change in accrued income tax includes effects from income tax receivable, but the B/S number does not.
5	7366	2002	Incomparable items	Compustat B/S income tax payable includes only current portion of income tax, e.g. "accrued tax", while SCF also includes effect from long-term portion, e.g. "accumulated deferred income taxes and taxes accrued";
6	114525	2007	Incomparable items	In B/S, income tax payable excludes "other tax liabilities", which is included by SCF change in accrued income tax.

Panel F: Firms with non-articulation in changes in other current assets/liabilities

Obs.	GVKEY	Fiscal year	REASON	DETAILS
			Small difference of around $1 million	
1	121762	2000	Compustat error	"Accrued salaries and employee benefits" and "Other accrued liabilities" are included on B/S but are excluded on SCF.
2	65665	1999	Compustat error	(1) "Deferred tax assets" is classified as "other current assets" on B/S, but not on SCF. (2) "Income tax receivable' is classified as "other current assets" in SCF but not on B/S.
3	13828	2000	Long-term assets/liabilities related to operating activities Current assets/liabilities not related to operating activities	(1) Non-current portion of "Other assets" is considered in the operating activities section on SCF, though it is classified as non-current assets on B/S. (2) "Accrued compensation" and "Other accrued liabilities" are not considered in the operating activities section on SCF, though they are classified as other current liabilities on B/S.
			Large difference	
4	5606	1998	Long-term assets/liabilities related to operating activities	Non-current portion of "Other assets, net" is considered in the operating activities section in SCF, though it is classified as non-current assets in B/S.
5	3226	2004	Definition inconsistency	Firm changes the definition of "Accrued expenses and other current liabilities" in year 2004. This change affects the B/S number but not the SCF number.
6	1690	2006	Long-term assets/liabilities related to operating activities	Non-current portion of "Other assets" is included in operating activities section in SCF, though it is classified as non-current assets in B/S.

Panel G: Firms with non-articulation in depreciation expenses

Obs.	GVKEY	Fiscal year	REASON	DETAILS
				Small difference of around $1 million
1	9170	2003	Compustat error	Compustat does not include "amortization for asset held under capital lease" in I/S, although it is included in SCF.
2	156293	2005	Compustat error	"Commitment fee written-off due to termination of senior credit facility" is considered part of depreciation and amortization in SCF, but not in I/S.
3	28622	2000	Compustat error	"Amortization of deferred compensation" is considered part of depreciation and amortization in SCF but not in I/S.
				Large difference
4	3226	2007	Compustat error	"Amortization expenses" is considered in SCF but not in I/S.
5	123995	2001	Compustat error	"Amortization expenses" is considered in SCF but not in I/S.
6	61489	2005	Compustat error	"Capitalized software and other intangible assets amortization" is considered in SCF but not in I/S.

Notes:
SCF stands for Statement of Cash Flows, I/S stands for Income Statement and B/S stands for Balance Sheet.

Table 3: Fama-MacBeth regression - Impact of the four items, 27,200 obs. Dependent variable = SAR_{t+1}

Regression 1: $SAR_{t+1} = b_0 + b_1 * TACCR\_CF$

Regression 2: $SAR_{t+1} = b_0 + b_1 * ACCR\_CF$

Regression 3: $SAR_{t+1} = b_0 + b_1 * TACCR\_CF + b_2 * Four\_items$

Regression 4: $SAR_{t+1} = b_0 + b_1 * TACCR\_CF + b_2 * DEF\_TAX + b_3 * EQU\_GL$
$$+ b_4 * PPE\_GL + b_5 * OF$$

Panel A: Independent variables measured by raw values

	Regression 1	**Regression 2**	**Regression 3**	**Regression 4**
Intercept	0.021	0.015	0.020	0.020
(p-value)	(0.239)	(0.420)	(0.272)	(0.262)
TACCR_CF	0.006		-0.111	-0.113
(p-value)	(0.900)		(0.047)	(0.041)
ACCR_CF		-0.107		
(p-value)		(0.056)		
Four_items			0.263	
(p-value)			(0.013)	
DEF_TAX				-0.074
(p-value)				(0.801)
EQU_GL				0.332
(p-value)				(0.274)
PPE_GL				0.334
(p-value)				(0.403)
OF				0.259
(p-value)				(0.014)
Adj. R^2	0.0012	0.0006	0.0027	0.0049

Panel B: Independent variables measured by decile rankings

	Regression 1	Regression 2	Regression 3	Regression 4
Intercept	0.040	0.054	0.049	0.047
(p-value)	(0.199)	(0.048)	(0.107)	(0.114)
TACCR_CF	-0.041		-0.059	-0.056
(p-value)	(0.184)		(0.062)	(0.067)
ACCR_CF		-0.070		
(p-value)		(0.014)		
Four_items			0.117	
(p-value)			(0.013)	
DEF_TAX				0.035
(p-value)				(0.619)
EQU_GL				0.009
(p-value)				(0.942)
PPE_GL				0.065
(p-value)				(0.429)
OF				0.119
(p-value)				(0.035)
Adj. R^2	0.0013	0.0014	0.0029	0.0037

Note:

This sample includes 27,200 obs. where *ACCR_BS, ACCR_CF, TACCR_CF, DEF_TAX, EQU_GL, PPE_GL,* and *OF* are non-missing. The regression is run annually and the mean value of annual coefficient estimates is reported. The statistically significant level is based on the distribution of annual coefficient estimates. Panel A reports results based on the raw values and Panel B reports results based on the decile ranks. The deciles are formed annually and the values of the decile ranks range from 0 (the lowest decile) to 1 (the highest decile). All variables are as defined in the appendix.

Table 4: Fama-MacBeth regression - Impact of the non-articulations, 27,200 obs. Dependent variable = SAR_{t+1}

Regression 1: $SAR_{t+1} = b_0 + b_1 * ACCR\_CF$

Regression 2: $SAR_{t+1} = b_0 + b_1 * ACCR\_BS$

Regression 3: $SAR_{t+1} = b_0 + b_1 * ACCR\_CF + b_2 * Non\_aritcuations$

Regression 4: $SAR_{t+1} = b_0 + b_1 * ACCR\_CF + b_2 * DIF\_AR + b_3 * DIF\_IN + b_4 * DIF\_AP$
$$+b_5 * DIF\_TP + b_6 * DIF\_OT + b_7 * DIF\_DEP$$

Panel A: Independent variables measured by raw values

	Regression 1	Regression 2	Regression 3	Regression 4
Intercept	0.015	0.014	0.014	0.018
(p-value)	(0.420)	(0.439)	(0.437)	(0.290)
ACCR_CF	-0.107		-0.120	-0.158
(p-value)	(0.056)		(0.035)	(0.014)
ACCR_BS		-0.119		
(p-value)		(0.015)		
Non_articulations			0.007	
(p-value)			(0.883)	
DIF_AR				0.267
(p-value)				(0.020)
DIF_IN				0.036
(p-value)				(0.872)
DIF_AP				0.098
(p-value)				(0.576)
DIF_TP				-0.967
(p-value)				(0.221)
DIF_OT				-0.003
(p-value)				(0.978)
DIF_DEP				0.487
(p-value)				(0.180)
Adj. R^2	0.0006	0.0003	0.0008	0.0063

Panel B: Independent variables measured by decile rankings

	Regression 1	Regression 2	Regression 3	Regression 4
Intercept	0.054	0.061	0.053	0.056
(p-value)	(0.048)	(0.038)	(0.050)	(0.047)
ACCR_CF	-0.070		-0.068	-0.073
(p-value)	(0.014)		(0.017)	(0.011)
ACCR_BS		-0.083		
(p-value)		(0.005)		
Non_articulations			0.030	
(p-value)			(0.248)	
DIF_AR				0.056
(p-value)				(0.181)
DIF_IN				0.095
(p-value)				(0.490)
DIF_AP				0.011
(p-value)				(0.859)
DIF_TP				-0.311
(p-value)				(0.278)
DIF_OT				0.012
(p-value)				(0.777)
DIF_DEP				0.073
(p-value)				(0.422)
Adj. R^2	0.0014	0.0014	0.0018	0.0029

Note:

This sample includes 27,200 obs*.* where *ACCR_BS, ACCR_CF, TACCR_CF, DEF_TAX, EQU_GL, PPE_GL,* and *OF* are non-missing. The regression is run annually and the mean value of annual coefficient estimates is reported. The statistically significant level is based on the distribution of annual coefficient estimates. Panel A reports results based on the raw values and Panel B reports results based on the decile ranks. The deciles are formed annually and the values of the decile ranks range from 0 (the lowest decile) to 1 (the highest decile). All variables are as defined in the appendix.

Table 5: Fama-MacBeth regression - Impact of the four-items and non-articulations, 27,200 obs.

Dependent variable = SAR_{t+1}

Regression 1: $SAR_{t+1} = b_0 + b_1 * TACCR\_CF$

Regression 2: $SAR_{t+1} = b_0 + b_1 * ACCR\_BS$

Regression 3: $SAR_{t+1} = b_0 + b_1 * TACCR\_CF + b_2 * Four_{items} + b_3 * Non\_aritcuations$

Regression 4: $SAR_{t+1} = b_0 + b_1 * TACCR\_CF + b_2 * DEF\_TAX + b_3 * EQU\_GL + b_4 * PPE\_GL$

$$+ b_5 * OF + b_6 * DIF\_AR + b_7 * DIF\_IN + b_8 * DIF\_AP + b_9 * DIF\_TP$$

$$+ b_{10} * DIF\_OT + b_{11} * DIF\_DEP$$

Panel A: Independent variables measured by raw values

	Regression 1	**Regression 2**	**Regression 3**	**Regression 4**
Intercept	0.021	0.014	0.018	0.018
(p-value)	(0.239)	(0.439)	(0.306)	(0.290)
TACCR_CF	0.006		-0.123	-0.158
(p-value)	(0.900)		(0.031)	(0.014)
ACCR_BS		-0.119		
(p-value)		(0.015)		
Four_items			0.273	
(p-value)			(0.011)	
Non_articulations			0.023	
(p-value)			(0.646)	
DEF_TAX				-0.078
(p-value)				(0.773)
EQU_GL				0.384
(p-value)				(0.190)
PPE_GL				0.434
(p-value)				(0.284)
OF				0.276
(p-value)				(0.011)
DIF_AR				0.267
(p-value)				(0.020)
DIF_IN				0.036
(p-value)				(0.872)
DIF_AP				0.098
(p-value)				(0.576)
DIF_TP				-0.967
(p-value)				(0.221)
DIF_OT				-0.003
(p-value)				(0.977)
DIF_DEP				0.487
(p-value)				(0.180)
Adj. R^2	0.0012	0.0003	0.0029	0.0063

Panel B: Independent variables measured by decile rankings

	Regression 1	Regression 2	Regression 3	Regression 4
Intercept	0.040	0.061	0.047	0.048
(p-value)	(0.199)	(0.038)	(0.119)	(0.102)
TACCR_CF	-0.041		-0.055	-0.058
(p-value)	(0.184)		(0.079)	(0.049)
ACCR_CF				
(p-value)				
ACCR_BS		-0.083		
(p-value)		(0.005)		
Four_items			0.119	
(p-value)			(0.010)	
Non_articu			0.036	
(p-value)			(0.136)	
DEF_TAX				0.032
(p-value)				(0.663)
EQU_GL				-0.009
(p-value)				(0.943)
PPE_GL				0.059
(p-value)				(0.453)
OF				0.131
(p-value)				(0.011)
DIF_AR				0.070
(p-value)				(0.084)
DIF_IN				0.105
(p-value)				(0.404)
DIF_AP				0.009
(p-value)				(0.882)
DIF_TP				-0.308
(p-value)				(0.281)
DIF_OT				0.024
(p-value)				(0.566)
DIF_DEP				0.056
(p-value)				(0.542)
Adj. R^2	0.0013	0.0014	0.0032	0.0047

Note:

This sample includes 27,200 obs. where *ACCR_BS, ACCR_CF, TACCR_CF, DEF_TAX, EQU_GL, PPE_GL,* and *OF* are non-missing. The regression is run annually and the mean value of annual coefficient estimates is reported. The statistically significant level is based on the distribution of annual coefficient estimates. Panel A reports results based on the raw values and Panel B reports results based on the decile ranks. The deciles are formed annually and the values of the decile ranks range from 0 (the lowest decile) to 1 (the highest decile). All variables are as defined in the appendix.