Defining, Measuring and Modeling Accruals:
A Guide for Researchers

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ABSTRACT: Research on accounting accruals is pervasive. Yet the measurement and modeling of accruals has developed in an *ad hoc* manner, resulting in a fragmented and incomplete body of research. Our goal is to rectify this situation by (i) providing a comprehensive definition of accruals, (ii) formulating a corresponding empirical measure of accruals, (iii) providing two decompositions of our measure of accruals that encapsulate the major classes of accruals studied in previous research, (iv) combining and expanding prior models of the fundamental determinants of accruals into one model, and (v) identifying the primary determinants of each of the major classes of accruals. We close by providing guidance for researchers in tailoring the selection of accruals to the research question at hand.

KEYWORDS: Accruals, operating accruals, financial accruals, conditional conservatism, cash flows.

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"By accounting for noncash assets, liabilities, revenues, expenses, gains, and losses, accrual accounting links an entity's operations and other transactions, events, and circumstances that affect it with its cash receipts and outlays."

***SFAC* No. 6, *Financial Accounting Standards Board*, 2008.**

1. Introduction

Research on accruals is pervasive in accounting journals. There are well over 100 articles in the leading accounting journals alone with variants of the word 'accrual' in their title. These articles represent just the tip of the iceberg. Many more papers employ accruals without explicit mention in the title. The popularity of accrual-based research is not surprising, since accruals are the primary mechanism through which accountants seek to make the primary financial statements more useful. What is surprising, however, is the myriad different ways in which accruals are measured in existing academic research. Most research provides scant rationale to support the selected measure of accruals. Instead, the literature has developed in an *ad hoc* fashion, with the measures of working capital accruals selected in early research dominating subsequent research. Yet these measures are incomplete from a conceptual perspective.

Our goal in this paper is to provide a systematic framework to guide research on accruals. Following Richardson et al. (2005), we begin by providing a comprehensive definition of accruals that incorporates all non-cash assets and liabilities and a corresponding measure of accruals for use in empirical research. We then categorize accruals according to the nature of the underlying future benefits and obligations that they represent, resulting in two accrual decompositions.

First, we decompose accruals into three categories along the lines suggested in Richardson et al. (2005). The three categories are working capital accruals, noncurrent operating accruals and financial accruals. Second, we categorize accruals according to whether or not they articulate across the balance sheet and the statement of cash flows. Non-articulating accruals have been a source of controversy in previous research (e.g., Hribar and Collins, 2002, Casey et al., 2017), with accruals relating to business acquisitions representing the most significant type of non-articulating accrual. We show that non-articulating accruals have both different determinants and a different relation with earnings. We also categorize the remaining 'articulating' accruals according to whether or not they arise from conditionally conservative accounting (e.g., asset write-downs). Following Basu (1997), Ball and Shivakumar (2006) and Dechow and Ge (2006), we show that conditionally conservative accruals have unique properties. Most notably, they are asymmetric in nature, associated with poor underlying operating performance and are the primary driver of low persistence of the accrual component of earnings.

Our accrual measurement framework highlights the shortcoming of popular measures of accruals used in previous research. Early accruals research focuses almost exclusively on variants of working capital accruals derived from the balance sheet (Healy, 1985; Rayburn, 1986; Wilson, 1986). We show that noncurrent operating accruals are more economically significant than working capital accruals. Barring some compelling reason to focus on working capital accruals alone, we encourage future accruals-based research to incorporate noncurrent operating accruals. Another popular measure of accruals focuses on the difference between net income and cash flows from operating activities taken from the statement of cash flows (e.g., Hribar and Collins, 2002). This measure of accruals is incomplete in two important respects. First, this measure of accruals incorporates the reversal, but not the origination, of many noncurrent operating accruals. For example, this measure of accruals includes depreciation and write-downs of property, plant and equipment (PP&E), but does not include the accruals relating to the initial capitalization of property plant and equipment. As such, this measure of accruals is downward biased and incomplete. Second, this measure of accruals excludes working capital accruals relating to business acquisitions and divestitures. Again, barring some compelling reason to exclude these accruals, we encourage future research to incorporate them.

Our research also provides several innovations for the modeling of 'normal' or 'non-discretionary' accruals. First, we show that the impact of growth in operating activities on accruals is critically dependent on the net capital intensity at the beginning of the period. For example, some firms are increasingly operating with negative working capital (see Chu, 2012), and so growth in the scale of operations often leads to reductions in net working capital accruals in these firms. Second, we show that additional leads and lags of cash flows beyond one year significantly and incrementally explain accruals, particularly long-term operating accruals. Third, we introduce a piecewise-linear market-to-lagged-book ratio as a new and parsimonious method of modeling conditionally conservative accruals.

We close by identifying the categories of accruals that are most appropriate for specific research settings. In the absence of a compelling reason to focus on a specific category of accruals, we recommend that accrual researchers employ a comprehensive measure of accruals. That said, there could be compelling reasons for specific research settings to focus on particular categories of accruals. For example, research on earnings misstatements could focus on articulating operating accruals. These accruals have a direct impact on earnings and have relatively high subjectivity. Research on conditional conservatism could focus on the amount and timing of accruals related to asset impairments. Finally, research examining accrual reversals could focus on articulating working capital accruals in mature firms with stable earnings. Such accruals should reverse in a timely fashion and should map closely into adjacent cash flows.

The remainder of this paper is organized as follows. Section 2 describes our definition, measurement and categorization of accruals. Section 3 discusses the properties and determinants of accruals. Section 4 describes our data and presents our empirical results and section 5 concludes.

2. Defining, Measuring and Categorizing Accruals

2.1. A Comprehensive Approach to the Definition and Measurement of Accruals

The accrual accounting process involves accounting for non-cash assets and liabilities. In defining accounting accruals, it is therefore necessary to distinguish between cash and non-cash asset accounts and between liability and equity accounts. We define cash to include cash and short-term investments. We categorize other financial assets, such as long-term investments in marketable securities, in non-cash assets.[1] Similarly, we define equity narrowly to include only common stockholders' equity. Other types of hybrid equity, such as preferred stock and minority interest, are therefore treated as liabilities for the purpose of computing accruals. Changes in non-cash assets represent anticipated future benefits, while changes in liabilities represent anticipated future obligations. Subtracting the aggregate change in liabilities from the aggregate change in non-cash assets provides the net change in anticipated future benefits attributable to the accrual accounting process. We refer to this amount as the comprehensive accruals for the period. Empirically, we measure comprehensive accruals (*COMPACC*) as the change in common stockholders' equity (*ΔCEQ*) less the change in cash and cash equivalents (*ΔCHE*):

$$COMPACC = \Delta CEQ - \Delta CHE \tag{1}$$

Intuitively, since the change in common stockholders' equity equals the change in assets less the change in liabilities, *COMPACC* represents the change in non-cash assets less the change in liabilities.

We also provide corresponding definitions of earnings (*EARN*) and cash flows (*CF*). *EARN* is defined as comprehensive income (*CITOTAL*) less preferred dividends (*DVP*) and stock-based compensation expense (*STKCO*):

$$EARN = CITOTAL - DVP + STKCO \tag{2}$$

We start with comprehensive income because components of accumulated other comprehensive income, such as unrealized gains and losses on available-for-sale securities, are included in *COMPACC*. We adjust for *DVP* to isolate the earnings available to common stockholders, consistent with the common

[1] Note that this definition of cash is more restrictive than the definition proposed in Ohlson (2014). Ohlson includes 'approximate equivalents' of cash, including long-term marketable securities and debt, in the definition of cash. In our view, the measurement of these assets and liabilities embodies accrual accounting assumptions that makes them an integral part of the accrual accounting process. Note, however, that we do separately categorize and analyze these 'financial' accruals.

equity perspective in our definition of accruals. We add back *STKCO* because it represents an atypical accounting adjustment to net income that is not incorporated in *COMPACC*.[2]

We then define cash flows as the difference between earnings and accruals:

$$CF = EARN - COMPACC \tag{3}$$

Intuitively, this measure of cash flows is equal to the change in the cash balance plus the net cash dividends paid to common stockholders (where net cash dividends include cash paid for common stock repurchases less cash raised from common equity issuances).

We can use the information provided in the financial statements to decompose *COMPACC* into accrual categories that serve different functions and may therefore have different properties. Throughout this paper, we use the following two decompositions of *COMPACC*, where each of the categories are defined below:

First decomposition:

$$COMPACC = \underbrace{WCACC + LTACC}_{OPACC} + FINACC$$

Second decomposition:

$$COMPACC = \underbrace{CC\_ACC + NA\_ACC + \underbrace{OA\_WCACC + OA\_LTACC}_{OA\_OPACC}}_{OPACC} + FINACC$$

Following Richardson et al. (2005), we begin by categorizing accruals according to whether they relate to the operations of the business or the financing of the business. We assume that all assets other than cash and investments and all liabilities other than debt relate to the operations of the business:

[2] The earnings adjustment for stock-based compensation expense essentially involves a transfer between paid in capital and retained earnings, with no net effect on common equity (*CEQ*). It does not involve asset or liability accounts and it does not relate to past or future cash flows. As such, we exclude this earnings adjustment from our comprehensive definition and measure of accruals. For consistency, we therefore exclude it from our definition and measurement of earnings. One could make the case that it should be included as a new category of accruals. While acknowledging this case, we leave it to future research to examine this accounting adjustment.

$$OPACC = (\Delta AT - \Delta CHE - \Delta IVAEQ - \Delta IVAO) - (\Delta LT - \Delta DLC - \Delta DLTT) \quad (4)$$

where ΔAT denotes the change in total assets, ΔCHE denotes the change in cash and short-term investments, $\Delta IVAEQ$ and $\Delta IVAO$ denote the changes in long-term investments and advances (which are assumed to be financial rather than operating in nature), ΔLT denotes the change in total liabilities, ΔDLC denotes the change in debt included in current liabilities and $\Delta DLTT$ denotes the change in debt included in long-term liabilities. This leaves changes in all investment accounts, all debt accounts and all equity accounts other than common equity categorized as financial accruals (*FINACC*):[3]

$$FINACC = COMPACC - OPACC \quad (5)$$

We next decompose *OPACC* along two different dimensions. Our first decomposition follows Richardson et al. (2005, 2006) in decomposing *OPACC* according to whether the underlying asset or liability represents short-term versus long-term future benefits or obligations. We define working capital accruals (*WCACC*) as changes in non-cash current assets less changes in current liabilities excluding changes in the current portion of long-term debt, $(\Delta ACT - \Delta CHE) - (\Delta LCT - \Delta DLC)$. These operating accruals are short-term in nature and are expected at the transaction level to reverse within a year. We then define long-term operating accruals (*LTACC*) as the difference between *OPACC* and *WCACC*. These accruals reflect long-term anticipated future benefits and obligations, such as PP&E and pension obligations. Thus, we obtain our first accrual decomposition:

$$COMPACC = WCACC + LTACC + FINACC \quad (6)$$

Our second accrual decomposition focuses on the nature of the transaction or event leading to an *OPACC* accrual. In this respect, there are two distinct categories of accruals that have received special attention in the literature. The first category is accruals relating to conditionally conservative accounting, whereby assets must be written down when their carrying value exceeds certain thresholds (e.g., fair value in the case of goodwill). Beginning with Basu (1997), a large body of research

[3] Note that changes in accounts that Compustat classifies as part of shareholders equity but not part of common shareholders equity are included in *FINACC*.

investigates conditionally conservative accruals. These accruals reflect the view that when previously anticipated future benefits no longer exist, they should be reversed via an asset write-down and associated charge to earnings. Ball and Shivakumar (2006) and Dechow and Ge (2006) provide evidence that this category of accruals has different properties from other operating accruals.

The second category incorporates accruals arising from 'non-articulating' events, such as non-cash acquisitions/divestitures and foreign currency translation adjustments. We refer to these events as non-articulating events because they cause a difference between accruals measured using the balance sheet and accruals measured using the statement of cash flows. An example is the purchase of inventory as part of the acquisition of another company. The acquired inventory is capitalized on the balance sheet of the acquiring company, and hence correctly classified as an inventory accrual when measured using the balance sheet approach. On the statement of cash flows, however, the cash outflow associated with the inventory purchase is not classified in the operating section of the statement of cash flows. If the acquisition was for cash, the cash outflow will be classified in the investing section as cash used for acquisitions. In this case, we will only pick up the accrual using the cash flow approach if we subtract both operating and investing cash flows from net income. On the other hand, if the acquisition involves an exchange of stock, no cash outflow will appear on the statement of cash flows. In this case, measuring accruals by taking the difference between net income and cash flows will omit the accrual altogether.

Hribar and Collins (2002) were the first to highlight the presence of accruals arising from non-articulating events. Hribar and Collins took the position that these non-articulating accruals represent measurement error in balance-sheet-based accrual estimates.[4] In contrast, Casey et al. (2017) recognize them as legitimate accruals, albeit arising from a different source and having different properties from

[4] Hribar and Collins (2002, pp. 107-108) state that "Changes in assets and liabilities due to these non-operating events show up in the balance sheet, but do not flow through the income statement. Consequently, a portion of the changes in balance sheet working capital accounts relates to the non-operating events, and would erroneously be shown as accruals under the balance sheet approach."

articulating accruals. For example, whether a company purchases inventory piecemeal or as part of an acquisition, the capitalization of the inventory on the balance sheet still represents an accrual. Even so, the properties of the accruals arising from business acquisitions may be quite different from accruals arising from regular operating transactions.

Denoting conditionally conservative accruals as *CC_ACC*, non-articulating operating accruals as *NA_ACC* and the remaining 'other articulating' operating accruals as *OA_OPACC*, our second accrual decomposition is:

$$COMPACC = CC\_ACC + NA\_ACC + OA\_OPACC + FINACC \tag{7}$$

Finally, we further decompose *OA_OPACC* into 'other articulating' working capital accruals (*OA_WACC*) and 'other articulating' long-term operating accruals (*OA_LTACC*).

$$COMPACC = CC\_ACC + NA\_ACC + OA\_WCACC + OA\_LTACC + FINACC \tag{8}$$

Following Lawrence, Sloan and Sun (2013), we measure *CC_ACC* using the Compustat data item 'funds from operations-other' (*FOPO*). This data item incorporates asset impairments and other non-cash charges that are added back to earnings in the operating section of the statement of cash flows. It may also include a variety of other items that are not associated with conditionally conservative accounting. Two of these items, excess tax benefits from stock-based compensation (*TXBCO*) and stock-based compensation expense (*STKCO*), are separately measured by Compustat. We therefore add back these items in the computation of *CC_ACC*. Compustat does not separately measure other less common items, such as adjustments for minority interest in earnings. We therefore only include the resulting amount in *CC_ACC* if it is less than zero, and thus consistent with an impairment charge. We also discovered that some asset impairments are included in *XIDO* on the income statement, but excluded from *XIDOC* and *FOPO* on the statement of cash flows.[5] To incorporate these impairments, we also add back the difference between *XIDO* and *XIDOC* whenever this difference is less than zero:

[5] We found that Compustat often omits asset write-downs from *FOPO* when they result from the cumulative effect of an accounting change. In such cases, Compustat simply omits the resulting charge from *XIDOC* in the statement of cash

$$CC\_ACC = \min((-FOPO + TXBCO + STKCO),0) + \min((XIDO - XIDOC),0) \tag{9}$$

where $\min(x,y)$ denotes the minimum value of x and y.

Following Hribar and Collins (2002) and Casey et al. (2017), we measure non-articulating accruals (*NA_ACC*) as the difference between operating accruals measured from the balance sheet (*OPACC*) and operating accruals measured from the statement of cash flows. Hribar and Collins restrict their attention to articulating accruals relating to the operating section of the statement of cash flows. Following Casey et al., we extend the definition of accruals to consider articulating accruals relating to the investing section of the statement of cash flows. Specifically, we measure operating accruals from the statement of cash flows as earnings (*NI - DVP + STKCO*) minus cash from operating activities (*OANCF*) and cash from investing activities that relates to the firm's operations (*IVNCF + IVCH - SIV - IVSTCH)*. Note that *IVNCF* is the Compustat variable for cash from investing activities and *IVCH*, *SIV*, *IVSTCH* are components of *IVNCF* that capture cash flows relating to financial assets rather than operating assets. Thus, non-articulating operating accruals (*NA_ACC*) are defined as:

$$NA\_ACC = OPACC - (NI - DVP + STKCO - OANCF - (IVNCF + IVCH - SIV - IVSTCH)) \tag{10}$$

Having isolated conditionally conservative accruals and non-articulating accruals, other articulating operating accruals (*OA_OPACC*) can now be defined as operating accruals measured from the balance sheet (*OPACC*), less conditionally conservative accruals (*CC_ACC*) and non-articulating accruals (*NA_ACC*):

$$OA\_OPACC = OPACC - CC\_ACC - NA\_ACC \tag{11}$$

In order to further decompose *OA_OPACC* into *OA_WCACC* and *OA_LTACC*, we derive the working capital accruals from the statement of cash flows:

$$OA\_WCACC = -RECCH - INVCH - APALCH - TXACH - AOLOCH \tag{12}$$

flows, even though it is recorded in *XIDO* on the income statement. This is particularly prevalent around the adoption of SFAS 142, which allowed for 'catch-up' goodwill impairments to be recorded as the cumulative effect of an accounting change.

where *RECCH* denotes the decrease in accounts receivable, *INVCH* denotes the decrease in inventories, *APALCH* denotes the increase in accounts payable and accrued liabilities, *TXACH* denotes the increase in accrued taxes and *AOLOCH* denotes the net decrease in other assets and liabilities. *OA_LTACC* is then simply defined as *OA_OPACC* less *OA_WCACC*.

2.2 Relation to Prior Literature

A voluminous literature examines accounting accruals. We systematically survey the definitions and empirical accrual measures used in the prior archival literature. This portion of our study is not intended to be a comprehensive survey, but rather to illustrate the diversity of accrual definitions and measurements used in the accounting literature. A *Web of Science* search for variants of the word "accrual" in the title of publications from *The Accounting Review*, *Contemporary Accounting Research*, *Journal of Accounting and Economics*, *Journal of Accounting Research* and *Review of Accounting Studies* returns 158 papers published through 2016. Of these papers, 28 are analytical, experimental or discussion papers that do not use an archival accrual measure, 4 examine a specific accrual account and 2 do not state how accruals are calculated. After excluding the aforementioned papers, we survey the accrual measures used in the 124 remaining papers. Since some papers use more than one measure of accruals, we have 157 accrual measurement observations.

We classify the 157 observations based on the Compustat variables employed in each measure. We identify 40 separate measures of accruals that we organize into five groups in Table 1. The first three groups encompass some variant of working capital accruals. The most common differences are whether to compute accruals using data from the balance sheet or statement of cash flows and whether or not to include depreciation expense. Probably because early accrual papers employed working capital accruals (Healy, 1985; Rayburn, 1986; Wilson, 1986), most accrual papers in our survey likewise employ measures of working capital accruals: 142 out of the 157 (90.4%) observations fall into one of the first three categories. Within each working capital group, various line items such as taxes payable and other current assets and liabilities are sometimes excluded. Note that many of these accrual measures capture only the origination or reversal of particular non-cash asset and liability accounts. For example, the accruals measures in group 2 incorporate depreciation and amortization accruals, but do not incorporate capital expenditures that make up the initial origination of these accruals.

Groups 4 and 5 in Table 1 include the relatively small number of papers using accruals measures incorporating non-current accruals. These definitions differ based on whether they use data from the balance sheet or the statement of cash flows and on whether they include financial accruals. The two measures of accruals that come closest to our comprehensive measure of accruals are the aggregate accrual measure in Dechow (1994) and the balance-sheet-based total accruals measure in Richardson et al. (2005). Dechow (1994) measures aggregate accruals as the difference between earnings before extraordinary items and discontinued operations (*IB*) and the change in the cash balance *(ΔCHE*). While very similar to our comprehensive measure of accruals, this measure misclassifies cash distributions to stockholders as accruals. For example, if a firm pays a dividend to common stockholders, net income is unaffected, but the cash balance falls. Thus, this measure mistakenly treats the cash dividend as an accrual. Our measure avoids this problem by using the change in common equity (*ΔCEQ*) in place of *IB*. Richardson et al. (2005) measure total accruals as the change in non-cash working capital plus the change in net noncurrent operating assets plus the change in net financial assets. This measure differs from our measure of comprehensive accruals (*COMPACC*) in two respects. First, it classifies short-term investments (*IVST*) as an accrual account rather than as a cash account. We acknowledge that one could argue for either treatment, since these short-term investments are not strictly cash, but as a practical matter, they are very similar to cash. Second, they do not include 'Non-controlling interests – non redeemable' (*MIBN*) as an accrual account. This omission is an historical quirk. Compustat created this accrual account in 2009 in response to SFAS 160, which required certain minority interest to be classified in the equity section of the balance sheet.

3. Properties of Accruals

Prior literature identifies three roles for accounting accruals:

(i) Capturing investments related to growth in the scale of business operations (Jones, 1991; Fairfield, Whisenant and Yohn, 2003; Ohlson, 2014),

(ii) Alleviating timing differences between economic events and their associated cash flows effects (Dechow, 1994), and

(iii) Reflecting the asymmetric timely recognition of losses (Basu, 1997; Ball and Shivakumar, 2006).

In this section, we summarize each of these roles and then generate predictions regarding the properties of the various accrual categories identified in section 2.1 as they relate to these roles. For easy reference, we summarize these predictions in Table 2.

3.1 Capital Investments and the Scale of Business Operations

Most businesses require investments in working capital, PP&E and other assets in order to operate. These investments should generate future economic benefits and so they are typically recorded as assets on the financial statements. As firms change the scale of their business operations, the amount of investment required to support these operations is also subject to change. To the extent that such investments are recorded as assets on the balance sheet, changes in the scale of operations will lead to accounting accruals.

Previous research has typically modeled accruals relating to growth in the scale of operations using growth in sales (Jones, 1991) or growth in employees (Allen, Larson and Sloan, 2013). This research has often assumed that the relation is stable across time and/or firms. We note that this assumption is likely to be violated in practice for at least two reasons. First, economies of scale will cause the relation to vary with scale. While some assets (e.g., working capital) are likely to grow in proportion to output, other assets (e.g., PP&E) are likely to be subject to economies of scale over certain ranges of output. Modeling economies of scale is difficult and so this source of variation in accruals is typically overlooked. Second, there are wide cross-sectional differences in net capital intensity. In the extreme, some businesses have negative net capital requirements because their operating liabilities (e.g., accounts payable, deferred revenue) exceed the magnitude of their operating assets.[6] Such businesses typically carry an offsetting cash balance to equitize the firm. For such businesses, growth in operating activities can result in negative accruals because operating liabilities grow by more than operating assets (Chu, 2012). Prior models linking accruals to growth ignore this issue, viewing accruals as a measure of growth in operating activities (e.g., Ohlson, 2014).

We propose to formally incorporate the net capital intensity of the firm into our model of accruals by conditioning the relation between accruals and firm growth on net capital intensity at the beginning of the period. We measure growth in the scale of operations using growth in the number of employees. We use growth in employees instead of growth in sales because sales is itself a product of the accrual accounting process and so its use is subject to the criticism that we are simply explaining accruals with contemporaneous accruals. The number of employees, in contrast, is a physical quantity that can be observed independently of the accrual accounting process. We predict that the growth rate in net capital will be proportional to the growth rate in employees. Since accruals capture changes in net capital that are recognized on the balance sheet as net operating assets, this leads to the prediction that accruals will equal the growth rate in employees multiplied by the beginning balance of net operating assets. We include both a main effect for growth to capture non-organic growth that is unrelated to the net capital intensity of existing operations in addition to an interaction term between growth and net capital intensity to capture organic growth that is related to existing net capital intensity. Thus, our specification for explaining the growth in accruals is:

$$ACC_{i,t} = \alpha_0 + \alpha_1 EMPGR_{i,t} + \alpha_2 EMPGR_{i,t} * NCI_{i,t-1} + \varepsilon_{i,t} \tag{13}$$

where $ACC_{i,t}$ denotes accruals for period t, $EMPGR_{i,t}$ denotes employee growth rate for period t and

[6] Prominent examples in 2016 include Apple, Palo Alto Networks, Splunk, Take-Two Interactive Software, Aspen Technology, Workday and ServiceNow.

$NCI_{i,t-1}$ denotes the beginning of period net capital intensity. Note that the definitions of *ACC* and *NCI* should be defined consistently, such that *NCI* reflects the net carrying value of the balance sheet accounts from which *ACC* is derived. For example, if we are modeling comprehensive accruals on the left-hand side, then *ACC* is our measure of comprehensive accruals (*COMPACC*) and *NCI* is measured as common equity less cash at the beginning of the period. If we are modeling working capital accruals on the left-hand side, then *ACC* is our measure of working capital accruals (*WCACC*) and *NCI* is measured as net non-cash working capital at the beginning of the period.

The first two rows in Table 2 outline our predictions concerning the signs of α_1 and α_2 for each accrual component. Starting with α_1, we predict, with two exceptions, a positive relation between *EMPGR* and each accrual component. The first exception is for financial accruals (*FINACC*), which we predict will be negatively associated with growth. This is because growth in net operating assets must be financed by debt or equity. To the extent that this growth is financed through debt, it will result in negative accruals in the form of increased debt liabilities. The second exception is for conditionally conservative accruals (*CC_ACC*), which we predict will be unrelated to employee growth. These accruals relate to asset write-downs in the face of sustained poor performance rather than to changes in the physical scale of operations.

Turning to α_2, we predict a positive relation for all accrual components with two exceptions. First, we make no prediction for conditionally conservative accruals (*CC_ACC*), because these accruals relate to asset impairments stemming from poor operating performance. Second, we make no prediction for non-articulating accruals (*NA_ACC*), because the net capital intensity of an acquired entity would not necessarily match the net capital intensity of the acquirer.

3.2 Alleviating Timing Differences

Cash flows over finite reporting horizons do not necessarily line up with the economic transactions and events that produce them. For example, the collection of cash associated with a credit sale is often realized in a subsequent period. An important purpose of accrual accounting is to alleviate these temporary timing differences, thus producing a more meaningful measure of periodic performance (i.e., earnings) than relying on cash flows alone (Dechow, 1994).

Alleviating timing differences is an important role of most accrual components. Within our first decomposition of accruals into operating and financial accruals, both categories of accruals serve to alleviate timing differences. For operating accruals, the nature of the timing difference depends on the type of operating accrual. Working capital accruals address short-term timing differences that, at the transaction level, typically resolve within a year. Long-term accruals address timing differences that can take many years to resolve. While not discussed in the previous literature, financial accruals also address timing problems. For example, issuing debt involves a cash inflow that is not associated with a commensurate increase in economic benefits (because of the obligation to repay the debt) and the repayment of debt involves a cash outflow that does not result in a net reduction in economic benefits (because it extinguishes the obligation to repay the debt). The length of the timing difference for a financial accrual depends on the nature of the underlying financial instrument. For example, a ten-year term loan will result in an initial increase in cash and associated reduction in accruals that will be reversed when the loan is repaid in ten years.

The established approach for modeling accruals' role in alleviating timing differences is to use contemporaneous cash flows in conjunction with leading and lagging cash flows (see Dechow and Dichev, 2002). To understand the intuition behind this approach, we consider a simple case where we assume that (i) a firm has constant predetermined earnings that are not affected by cash flow shocks, such that all of the variation in cash flows relates to variation in accruals. In this case,

$$ACC_t = EARN - CF_t$$

and so accruals are negatively related to contemporaneous cash flows with a coefficient of minus one. Next, if we make the additional simplifying assumptions that (ii) the entire accrual in period t reverses in period t+1; and (iii) no other new accruals originate in period t+1, then:

$$ACC_t = -EARN + \mathrm{CF}_{t+1}$$

With these additional assumptions, accruals are positively related to leading cash flows with a coefficient of one.

In practice, the above assumptions are likely to be violated. In particular:

1. Earnings are not constant, but vary with the underlying economic performance of the firm;
2. Accruals often reverse in periods other than the next period; and
3. Each period contains both the origination of new accruals and the reversal of old accruals.

The violation of each of these assumptions introduces 'errors-in-variables' problems into the estimation of the relation between accruals and cash flows that causes the estimated coefficients to be biased towards zero. Violation of the first assumption means that in a regression of accruals on contemporaneous cash flows, contemporaneous cash flows will not completely explain accruals, because cash flows will also reflect variation in underlying economic performance. Violations of the second and third assumptions introduce additional errors-in-variables. Violation of the second assumption means that the entire accrual will not necessarily reverse in the next period and hence be reflected in next period's cash flows. Violation of the third assumption means that next period's cash flow may also reflect the origination of new accruals. It is also possible that the accrual in the current period could reflect the reversal of a prior-period accrual.

Dechow and Dichev (2002) model annual working capital accruals using contemporaneous cash flows along with a single year's lead and lag of cash flows. Consistent with the intuition above, they find that (i) the coefficient on contemporaneous cash flows is negative and lies between -1 and 0; and (ii) the coefficients on the lead and lag cash flows are positive and lie between 0 and 1. Since we model both working capital accruals and long-term accruals, we incorporate additional leads and lags of cash flows. Thus, our accrual model augmented to model both changes in scale of operations and timing differences up to L leads and lags is:

$$ACC_{i,t} = \alpha_0 + \alpha_1 EMPGR_{i,t} + \alpha_2 EMPGR_{i,t} * NCI_{i,t-1} + \alpha_3 CF_{i,t} + \sum_{\tau=1}^{L}(\alpha_{3+\tau} CF_{i,t-\tau} + \alpha_{3+L+\tau} CF_{i,t+\tau}) + \varepsilon_{i,t} \quad (14)$$

where α_3<0 and α_j>0 for j=1,2L. For working capital accruals, we expect one-year leads and lags of cash flows to explain accruals. For long-term operating and financial accruals, we also expect leads and lags beyond one year to explain accruals. We conduct our primary empirical tests using two leads and lags (L=2) and also conduct robustness tests for up to eight leads and lags (L=8).

Table 2 summarizes our predictions concerning the role of accruals in alleviating timing differences. The first column lists our predictions for *COMPACC*, our comprehensive measure of accruals. Consistent with the discussion above, we predict a negative coefficient on contemporaneous cash flows and positive coefficients on the lags and leads of cash flows. These predictions carry over to each of the accrual components with two exceptions. First, for working capital accruals (*WCACC*), we make no predictions regarding the coefficients on leads and lags beyond one year. This is because working capital accruals typically reverse within one year or less. Second, we predict a positive relation between conditionally conservative accruals (*CC_ACC*) and contemporaneous cash flows. This is because conditional conservatism results in asymmetric, negative accruals in the face of poor economic performance (see the next section for details) and low contemporaneous cash flows reflect poor economic performance.

3.3 Conditional Conservatism

The third and final major role of accruals is to reflect conditional conservatism. The primary mechanism through which conditional conservatism manifests itself under U.S. GAAP is through requirements that firms immediately recognize expected future losses as they become probable and estimable, while only recognizing expected future gains as they are realized. In particular, most assets are subject to conditional conservatism in that they must be written down to fair value when their carrying value falls sufficiently below their fair value.[7] We therefore expect most accrual components

[7] The U.S. GAAP governing whether an asset's book value has fallen sufficiently below its fair value to warrant impairment vary by asset. For example, goodwill is required to be written down when its book value is determined to have dropped below its fair value, while PP&E is required to be written down when the undiscounted recoverable future cash flows fall below its book value.

to exhibit conditional conservatism. Our second accrual decomposition explicitly decomposes operating accruals into conditionally conservative accruals (*CC_ACC*), non-articulating accruals (*NA_ACC*) and other operating accruals (*OA_OPACC*). Within the context of this decomposition, we naturally expect conditional conservatism to be concentrated in the *CC_ACC* component of accruals.

We use the ratio of the market value at the end of the period to the book value at the beginning of the period (*MTLB*) to model conditionally conservative accruals.[8] Recognizing the asymmetric nature of conditional conservatism, we use a piecewise linear transformation so that for *MTLB* between 0 and 1 (i.e., potential impairment), the variable *PL_MTLB* equals *MTLB* – 1; and for *MTLB* greater than 1, *PL_MTLB* equals 0. This specification models the anticipated kink at *MTLB=1* (see Lawrence, Sloan and Sun, 2013). Exhibit 1 depicts the piecewise linear transformation of *MTLB* to *PL_MTLB*. We use the book value at the beginning of the period and the market value at the end of the period because the book value should be impaired if the fair value during the period falls to be sufficiently below the book value at the beginning of the period. Supplementing our accrual model with *PL_MTLB* gives:

$$ACC_{i,t} = \alpha_0 + \alpha_1 EMPGR_{i,t} + \alpha_2 EMPGR_{i,t} * NCI_{i,t-1} + \alpha_3 CF_{i.t} + \sum_{\tau=1}^{L}(\alpha_{3+\tau} CF_{i.t-\tau} + \alpha_{3+L+\tau} CF_{i.t+\tau}) + \alpha_{3+2L+1} PL\_MTLB_{i,t} + \varepsilon_{i,t} \quad (15)$$

We predict that conditionally conservative accruals will be more negative as *PL_MTLB* becomes more negative, resulting in a positive coefficient on *PL_MTLB*. As summarized by our predictions in Table 2, we predict that *PL_MTLB* will be positive for all accrual components except non-articulating accruals (*NA_ACC*). *NA_ACC* primarily relate to originating accruals generated by non-cash transactions and so are not affected by asymmetric impairment rules. We also predict that the coefficient on *PL_MTLB* will be particularly strong for conditionally conservative accruals (*CC_ACC*).

[8] In robustness tests, we test our predictions using the more typically employed proxies for conditional conservatism: negative stock returns (*DumRET* and *DumRET*RET*) and negative cash flows (*DumCF* and *DumCF*CF*). In our main analyses, we choose to use *PL_MTLB* instead of the return or cash flow proxies because a firm that experiences a negative news event would not write down assets if the fair market value of assets is greater than the book value of those assets. Moreover, comparisons of adjusted R^2s support the use of *PL_MTLB*.

4. Empirical Evidence on the Properties of Accruals

4.1 Data

We obtain financial statement data and stock return data from the CRSP-Compustat Merged (CCM) database, for the period 1988 to 2016. We begin our sample in 1988 due to cash flow data availability. We follow prior accrual research in eliminating all financial services companies (SIC 6000-6999) and limiting the sample to domestic firms only (popsrc=D). We require comprehensive accruals, accrual components, net income and employee growth to be non-missing in year *t*. In addition, we require cash flows to be non-missing from years *t*-2 to *t*+2. Our sample consists of 76,541 firm-year observations where year *t* is 1990 to 2014. Throughout our analyses, we winsorize all variables at the 1% and 99% tails to mitigate the effect of outliers, except the transformed variable *PL_MTLB* which is effectively winsorized at -1 and 0 (see Exhibit 1).

4.2 Descriptive Statistics

Table 3 presents descriptive statistics for key variables in our analyses. The first group of variables contains our measure of comprehensive accruals (*COMPACC*) and its components. *COMPACC* has a positive mean that is primarily driven by *LTACC*, the long-term operating accruals. Long-term accruals (*LTACC*) have the highest standard deviation of the underlying accrual components, reflecting the importance of long-term capital investments in driving overall accruals. Financial accruals (*FINACC*) have a significantly negative mean, consistent with the role of debt in financing growth in assets. Conditionally conservative accruals (*CC_ACC*) also have a significantly negative mean, consistent with their role in capturing asymmetric timeliness in loss recognition.

Figure 1 depicts the time series trends in the mean value of accruals during years *t*-5 to *t*+5 for the top and bottom deciles of each accrual category partitioned in year *t*. Consistent with the insights from Table 3, much of the variation in comprehensive accruals appears to come from *LTACC*. In contrast, the most commonly used accruals measure in extant research, working capital accruals (*WCACC*), exhibits relatively less variation in year *t*. Most of the accrual categories display strong mean reversion. *WCACC* and *FINACC* are almost perfectly mean reverting, while *LTACC*, *CC_ACC*, *NA_ACC* and *OA_LTACC* are more slowly mean reverting. Note that some long-term accruals such as depreciation are positively serially correlated by construction, potentially explaining the serial correlation in *LTACC* and *OA_LTACC*. The positive serial correlation in *CC_ACC* and *NA_ACC* are likely explained by serial correlation in management's decisions to take write-downs and engage in non-articulating events such as acquisitions.

Figure 2 depicts the time series patterns in the mean value of cash flows during years *t*-5 to *t*+5 for the top and bottom deciles of each accrual category partitioned on accruals in year *t*. We use the same axes scales as in Figure 1 to facilitate comparison. Consistent with predictions, most of the accrual categories show that contemporaneous cash flows are negatively related to accruals, while lead and lag cash flows are positively related to accruals. There are two major exceptions. First, for *CC_ACC*, both contemporaneous and lead/lag cash flows are positively related to accruals, particularly in the lowest accrual decile. This is consistent with our prediction that conditionally conservative accruals are more likely to be negative in the face of sustained poor cash flow performance. Second, for *NA_ACC*, both contemporaneous and lead/lag cash flows are strongly negatively related to accruals, suggesting that firms making acquisitions have persistently low cash flows.

Figure 3 depicts the time series patterns in the mean value of comprehensive earnings (*EARN*) during years *t*-5 to *t*+5 for the top and bottom deciles of each accrual category partitioned on accruals in year *t*. We again use the same axes scales as in Figures 1 and 2 to facilitate comparison. Consistent with Sloan (1996), earnings are positively related to contemporaneous accruals and lead/lag accruals for most of the accrual categories. The exceptions are *FINACC* and *NA_ACC*. For *FINACC*, the results are consistent with prior research suggesting that firms issue/repurchase debt just before income deteriorates/improves (e.g., Bradshaw, Richardson and Sloan, 2006). For *NA_ACC*, we see that companies with high non-articulating accruals have persistent losses. This suggests that companies growing via stock-based acquisitions have persistently low earnings. It is important to note that non-articulating accruals have a very different impact on earnings than other operating accruals, highlighting the importance of examining them as a separate category. The results for *NA_ACC* also suggest that Casey et al.'s (2017) interpretation of their earnings persistence regressions is wrong. Casey et al. find that non-articulating accruals have high earnings persistence and infer that high *NA_ACC* firms having persistently high earnings due to successful acquisitions. In contrast, we show that high *NA_ACC* firms actually have persistently low earnings.

Table 4 presents annual autocorrelation and correlation coefficients between the various categories of accruals, cash flows and comprehensive income. Comprehensive earnings exhibit the strongest serial correlation (0.70), followed by comprehensive cash flows (0.50). The components of accruals that are most strongly autocorrelated are *CC_ACC* (0.25) and *OA_OPACC* (0.21). In contrast, *WCACC* and *FINACC* show very weak autocorrelation. All categories of accruals except for *CC_ACC* are negatively correlated with contemporaneous cash flows, and all categories of accruals except *NA_ACC* are positively correlated with contemporaneous comprehensive income. *FINACC* is negatively correlated with *OPACC*, *WCACC*, *LTACC*, and *NA_ACC*, consistent with the use of debt to finance increases in operating assets. All accrual components except *FINACC* are positively correlated with *EMPGR*. *CF* is negatively correlated with *EMPGR*, reflecting the cash outflows that typically occur when firms grow their operations.

4.3 Empirical Results for Modeling Accrual Determinants

Table 5 presents the regression results for our primary model of the determinants of accruals (Eqn. 15). All regressions employ standard errors clustered by both firm and year to account for both cross-sectional and serial correlation in residuals. The first column reports results on the determinants of *COMPACC*, our comprehensive measure of accruals. All of the coefficient estimates are consistent with the predictions summarized in column 1 of Table 2, and the determinants combine to explain 45% of the variation in *COMPACC*. With respect to the growth variables, the interaction between growth and net capital intensity loads more significantly than the main effect for growth. This new result highlights the importance of conditioning on net capital intensity when modeling the impact of firm growth on accruals. With respect to the cash flow variables, we see that the second lead and lag of cash flows load significantly positively. These new results highlight the role of additional leads and lags of cash flows in explaining comprehensive accruals, which incorporates long-term accruals. Finally, *PL_MTLB*, our new determinant of conditionally conservative accruals, is positive and highly significant.

The remaining columns present similar results for each of the underlying accrual categories. These results are generally consistent with the predictions summarized in Table 2. With respect to the growth variables, we see three noteworthy results. First, *FINACC* is strongly negatively related to the main growth variable, reflecting the role of non-common-equity financing in funding the investing activities that accompany firm growth. Second, we see that *WCACC* is particularly strongly related to the interaction between growth and net capital intensity. This is because there is wide cross-sectional variation in working capital intensity, with numerous firms having negative net non-cash working capital. Third, we see that *NA_ACC* is particularly strongly related to the main growth variable. This is because *NA_ACC* can relate to diversifying acquisitions, which should lead to growth in employees, but may involve combining businesses with different levels of net capital intensity.

With respect to the cash flow variables, there are two noteworthy results. First, the second leads and lags of cash flows load consistently positively, and are larger for the long-term accrual components (*LTACC* and *OA_LTACC*) relative to the working capital accrual components (*WCACC* and *OA_WCACC*). This is consistent with the formers' role in capturing longer-term benefits and obligations. Second, *CC_ACC* is strongly *positively* related to contemporaneous cash flows. This reflects the increased frequency of asset impairments for firms with poor operating performance. Finally, *PL_MTLB*, the determinant of conditionally conservative accruals, has the predicted positive sign in all regressions, including in the *CC_ACC* regression.

4.4 Robustness Checks

A significant innovation in our model of accruals is to condition the impact of growth on the net capital intensity of the firm. The results in Table 5 show that the interaction between growth and net capital intensity is highly significant and generally more important than the main effect for growth. The regressions in Table 6 mirror those in the first five columns of Table 5 except that we decompose each of the accrual measures into the accruals relating to changes in assets and the accruals relating to changes in liabilities. Table 6 provides an alternative approach to conditioning growth on the level of net capital intensity. In Table 6, we separately model the asset and liability components of each accrual category. We then eliminate the net capital intensity interaction from the regression specification. We predict that growth leads to increases in both assets and liabilities, resulting in positive accruals for assets and negative accruals for liabilities (since increases in liabilities represent negative accruals). This approach has two conceptual differences over the use of the net capital intensity interaction in Table 5. First, it doesn't involve the use of an explanatory variable based on lagged accruals. Second, it allows the asset and liability components of accruals to have differing sensitivities to growth.

We predict that the asset accruals will be positively related to growth, while the liability accruals will be negatively related to growth. Predictions for other variables remain the same as those listed in Table 2. Asset accruals show a strong positive relation to growth in all but the *FINACC* regression. This result is intuitive, since financial asset accruals capture long-term financial investments that are not necessarily related to growth in employees. For example, a firm might liquidate financial assets held as investments in order to fund growth in operations. Liability accruals, on the other hand, show a strong negative relation to growth for all accrual categories. This negative relation is particularly pronounced for long-term operating accruals and financial accruals. The coefficients on the cash flow variables generally have the predicted signs for both asset and liability accruals, reflecting their common role in eliminating timing differences for both types of accruals. The notable exception is accruals for long-term operating liabilities (*LTACC_L*), where there is no significant relation. This might be because these accruals often relate to very long-dated obligations, such as pension obligations. The coefficients on *PL_MTLB* are mostly positive for asset accruals and mostly negative for liability accruals. The negative coefficient for liability accruals is inconsistent with conditional conservatism and likely arises because conditionally conservative accounting is primarily applied to assets, so *PL_MTLB* acts as more of a general growth proxy for liabilities. The key takeaway from Table 6 is that the impact of growth on accruals depends critically on the relative proportion of assets versus liabilities.

We next examine the sensitivity of our results to the inclusion of additional leads and lags of cash flows. Recall that in theory, additional leads/lags of cash flows should add additional information so long as they reflect the reversal/origination of accruals that originate/reverse in the current period. In practice, the bulk of reversals are likely to occur in adjacent periods, and so more distant leads and lags should become less relevant. While our primary regressions in Table 5 include just two leads and two lags, the regressions in Table 7 examine the impact of adding up to eight leads and lags to the main comprehensive accruals (*COMPACC*) regression. The results indicate that up to four lags of cash flows and up to seven leads of cash flows load with the predicted positive coefficients and are statistically significant. It is also noteworthy that the magnitudes and statistical significance of the coefficients on the cash flow leads and lags systematically decrease as the length of the lead or lag increases. Finally, beyond the addition of a third lead and lag in column (2), increases in explanatory power are minimal.

The final regression in column (8) reports the results using just two leads and lags of cash flows, as in Table 5, but limits the sample to column (7)'s sample that requires eight non-missing leads and lags. This last specification allows us to determine whether the addition of more leads and lags significantly alters the regression coefficients on any of the other determinants of accruals while holding the sample constant. A comparison of the regression coefficients between columns (7) and (8) indicates that there is very little difference in the other regression coefficients. Thus, using only two leads and lags does not appear to cause serious omitted variable biases in the other regression coefficients.

Finally, we examine the robustness of our results to alternative determinants of conditionally conservative accruals. First, following Basu (1997), we use *DumRET* and *DumRET*RET* to model conditionally conservative accruals in lieu of *PL_MTLB*. Second, we follow Ball and Shivakumar (2006) in using *DumCF* and *DumCF*CF* to model conditionally conservative accruals. Results (unreported) are qualitatively similar using these alternative determinants of conditional conservatism, and adjusted R^2s are slightly lower.

Our approach to measuring accruals that capture conditionally conservative accounting is subject to measurement error because the Compustat data item *FOPO*, on which *CC_ACC* is based, may include other gains and losses that are unrelated to conditional conservatism. We therefore investigate the sensitivity of our results to using the sum of asset write-downs and goodwill impairments as an alternative measure of *CC_ACC*. The drawback of this approach is that Compustat only provides these data items in the latter part of our sample period. The regression coefficients (unreported) are similar using this alternate measure.[9]

4.5 Selected Applications

We close this section by applying our comprehensive measures of accruals and associated accrual decompositions to three common applications of accruals analysis:

(i) Estimating earnings persistence,

(ii) Explaining future stock returns, and

(iii) Identifying earnings misstatements.

Prior research has extensively documented the differential persistence of the accrual and cash flow components of earnings. We provide evidence on the persistence of accruals components of earnings using our comprehensive measure of accruals and our accrual decompositions. Table 8 presents results for regressions of comprehensive earnings in year *t*+1 on the comprehensive cash flow and accrual components of earnings in year *t*. Column (1) presents the results for *COMPACC*, while

[9] Supplementary results for the unreported robustness tests are available from the authors on request.

columns (2) through (5) present results for our decompositions of *COMPACC*. In column (1), the coefficient on *COMPACC* is 0.566 whereas the coefficient on *CF* is higher at 0.745. This result is broadly consistent with earlier research showing that the accrual component of earnings is less persistent than the cash flow component of earnings (e.g., Sloan, 1996; Richardson et al., 2005). Column (3) disaggregates *COMPACC* into *WCACC*, *LTACC* and *FINACC*. The coefficient is highest on *FINACC* and lowest on *WCACC*. This result is again consistent with Richardson et al. (2005). Column (4) disaggregates *COMPACC* into *FINACC*, *CC_ACC*, *NA_ACC* and *OA_OPPACC*. *CC_ACC* is by far and away the least persistent component of accruals for future earnings, with a coefficient of only 0.292. This result is consistent Dechow and Ge (2006) and the fact that conditionally conservative accruals cause transitory reductions in earnings by recognizing the cumulative anticipated effect of bad news. *NA_ACC*, on the other hand, has a relatively high persistence coefficient of 0.683. This result is consistent with Casey et al. (2017) who find that non-articulating current operating accruals are highly persistent. They hypothesize that this result arises because acquisitions signal higher future earnings. However, as seen in Panel F of Figure 3, there is a very different explanation for this result. High non-articulating accruals are actually associated with low contemporaneous and future earnings, and the high persistence coefficient indicates that the low earnings persist. Finally, column (5) shows that the persistence of *OA_WCACC* is relatively low with a coefficient of only 0.558.

Prior research has also documented a negative relation between accruals and future stock returns that is particularly pronounced for less persistent accruals (e.g., Sloan, 1996; Richardson et al., 2005). Table 9 extends these results to our accrual decompositions by regressing future stock returns on the cash flow and accrual components of earnings. We use 12-month raw buy-and-hold returns, measured starting four months after the fiscal year end. Column (1) confirms the well-known negative relation between comprehensive accruals and future stock returns. Columns (2) and (3) essentially replicate the analysis in Richardson et al. (2005), showing that both current and noncurrent operating accruals drive return predictability. Columns (4) and (5) provide results for our new decomposition of accruals into conditionally conservative, non-articulating and other articulating accruals. There are several results of interest here. First, *CC_ACC* has the largest negative coefficient, suggesting that these accruals are the 'most mispriced' by investors.[10] This result is consistent with Dechow and Ge (2006) and suggests that investors overlook the fact that conditionally conservative accruals result in temporarily depressed earnings that will bounce back in the next year (see Panel E of Figure 3). It also highlights the importance of isolating conditionally conservative accruals when analyzing accrual persistence and mispricing. The coefficients on non-articulating and other articulating accruals are both significantly negative and similar in magnitude. Recall, however, that they have very different interpretations. The negative coefficient on non-articulating accruals suggests that investors fail to grasp the unusually high persistence of poor performance of companies engaging in non-cash acquisitions (see Panel F of Figure 3). Meanwhile, the negative coefficient on other articulating accruals indicates that investors fail to grasp the unusually low persistence of high earnings associated with high non-articulating accruals (see Panels G and H of Figure 3). Thus, this decomposition isolates components of earnings with very different implications for future earnings and returns, while corroborating Sloan's (1996) hypothesis that investors fail to distinguish between these different implications.

The last application of our comprehensive accrual decompositions is to the detection of accounting misstatements. Table 10 employs probit regressions in which the dependent variable is an indicator variable, *AAER1*, equaling 1 for the first year an earnings overstatement is identified in an SEC Accounting and Auditing Enforcement Release (AAER), and zero otherwise. The AAER misstatement events relate to earnings misstatements in annual financials, and the sample construction is detailed in Dechow et al. (2011). Consistent with Richardson et al. (2006), the coefficients on most accrual components are positive and statistically significant. The only exception is *CC_ACC*, and this is to be expected, since *CC_ACC* relates exclusively to negative accruals that would not contribute to earnings

[10] The results for *CC_ACC* have lower statistical significance, but this reflects the lower variation in this accrual component.

overstatements. Columns (4) and (5) indicate that other articulating accruals dominate non-articulating accruals in identifying accounting misstatements. This is again consistent with expectations, as these are the accruals over which managers exercise the most discretion to directly impact earnings. Collectively, these results highlight the importance of isolating other articulating accruals when trying to detect accounting misstatements.

5. Conclusions and Implications

This paper provides a comprehensive definition of accounting accruals that incorporates all non-cash adjustments to common equity and provides a corresponding empirical measure of accruals using Compustat variables. We also provide two decompositions of our comprehensive measure of accruals that isolate categories of accruals that serve different purposes and have different properties. We next formulate an integrated model of accrual determinants and we identify the most important determinants of each category of accruals. Finally, we illustrate how different categories of accruals can be useful in different applications.

Our research has a number of implications for future research. Perhaps most importantly, our research highlights the need for research on accounting accruals to carefully consider the empirical measure of accruals employed. In most cases, the accrual measures employed in the prior literature represent a small subset of our comprehensive measure of accruals. Absent a specific reason to focus on a specific subset of accruals, we suggest that future research use our comprehensive measure of accruals. The choice of the accruals measure may critically impact research results and inferences, since different categories of accruals have different properties.

Our research also provides several improvements for the modeling of 'normal' or 'non-discretionary' accruals. First, we show that the impact of firm growth on accruals depends critically on the net capital intensity at the beginning of the period. Second, we show that additional leads and lags of cash flows beyond one year can provide additional explanatory power for accruals, particularly for long-term operating accruals. Third, we introduce a piecewise market-to-lagged-book variable as a new and parsimonious approach for modeling conditionally conservative accruals.

Finally, our research should help to guide researchers in selecting the appropriate category of accruals for specific research questions. For example, research on earnings misstatements should focus on other articulating accruals and exclude conditionally conservative accruals and non-articulating accruals. Research examining short-term accrual reversals should focus on articulating working capital accruals in mature firms with stable earnings. Such accruals should reverse in a timely fashion and should map closely into contemporaneous and adjacent cash flows. Finally, research on conditional conservatism should focus directly on the amount and timing of accruals related to asset impairments.

REFERENCES

Ali, A., X. Chen, T. Yao and T. Yu. 2008. Do mutual funds profit from the accruals anomaly? *Journal of Accounting Research* 46 (1), 1-26.

Allen, E.J., C.R. Larson, and R.G. Sloan. 2013. Accrual reversals, earnings and stock returns. *Journal of Accounting and Economics* 56 (1), 113-129.

Arif, S., N. Marshall and T.L. Yohn. 2016. Understanding the relation between accruals and volatility: A real options-based investment approach. *Journal of Accounting and Economics* 62 (1), 65-86.

Ashbaugh-Skaife, H., D.W. Collins, W.R. Kinney and R. LaFond. 2008. The effect of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review* 83 (1), 217-250.

Ayers, B.C., J. Jiang and P.E. Yeung. 2006. Discretionary accruals and earnings management: An analysis of pseudo earnings targets. *The Accounting Review* 81 (3), 617-652.

Baber, W.R., S.H. Kang, and Y. Li. 2011. Modeling discretionary accrual reversal and the balance sheet as an earnings management constraint. *The Accounting Review* 86 (4), 1189-1212.

Badertscher, B.A., D.W. Collins and T.Z. Lys. 2012. Discretionary accounting choices and the predictive ability of accruals with respect to future cash flows. *Journal of Accounting and Economics* 53 (1-2), 330-352.

Ball, R. and L. Shivakumar. 2006. The role of accruals in asymmetrically timely gain and loss recognition. *Journal of Accounting Research* 44 (2), 207-242.

Balsam, S., E. Bartov and C. Marquardt. 2002. Accruals management, investor sophistication, and equity valuation: Evidence from 10-Q filings. *Journal of Accounting Research* 40 (4), 987-1012.

Barth, M.E., G. Clinch and D. Israeli. 2016. What do accruals tell us about future cash flows? *Review of Accounting Studies* 21 (3), 768-807.

Barth, M.E., D.P. Cram and K.K. Nelson. 2001. Accruals and the prediction of future cash flows. *The Accounting Review* 76 (1), 27-58.

Barth, M.E. and A.P. Hutton. 2004. Analyst earnings forecast revisions and the pricing of accruals. *Review of Accounting Studies* 9 (1), 59-96.

Bartov, E., F.A. Gul and J.S.L. Tsui. 2000. Discretionary-accruals models and audit qualifications. *Journal of Accounting and Economics* 30 (3), 421-452.

Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24 (1), 3-37.

Battalio, R.H., A. Lerman, J. Livnat and R.R. Mendenhall. 2012. Who, if anyone, reacts to accrual information? *Journal of Accounting and Economics* 53 (1-2), 205-224.

Beneish, M.D. and M.E. Vargus. 2002. Insider trading, earnings quality, and accrual mispricing. *The Accounting Review* 77 (4), 755-791.

Bernard, V.L. and D.J. Skinner. 1996. What motivates managers' choice of discretionary accruals? *Journal of Accounting and Economics* 22 (1-3), 313-325.

Bernard, V.L. and T.L. Stober. 1989. The nature and amount of information in cash flows and accruals. *The Accounting Review* 64 (4), 624-652.

Bhojraj, S. and B. Swaminathan. 2009. How does the corporate bond market value capital investments and accruals? *Review of Accounting Studies* 14 (1), 31-62.

Bowen, R.M., D. Burgstahler, and L.A. Daley. 1987. The incremental information content of accrual versus cash flows. *The Accounting Review* 62 (4), 723-747.

Bradshaw, M.T., S.A. Richardson and R.G. Sloan. 2001. Do analysts and auditors use information in accruals? *Journal of Accounting Research* 39 (1), 45-74.

Bradshaw, M.T., S.A. Richardson and R.G. Sloan. 2006. The relation between corporate financing activities, analysts' forecasts and stock returns. *Journal of Accounting and Economics* 42 (1-2), 53-85.

Burnett, B.M., B.M. Cripe, G.W. Martin and B.P. McAllister. 2012. Audit quality and the trade-off between accretive stock repurchases and accrual-based earnings management. *The Accounting Review* 87 (6), 1861-1884.

Bushman, R.M., A. Lerman and X.F. Zhang. 2016. The Changing Landscape of Accrual Accounting. *Journal of Accounting Research* 54 (1), 41-78.

Butler, M., A.J. Leone and M. Willenborg. 2004. An empirical analysis of auditor reporting and its association with abnormal accruals. *Journal of Accounting and Economics* 37 (2), 139-165.

Byzalov, D. and S. Basu. 2016. Conditional conservatism and disaggregated bad news indicators in accrual models. *Review of Accounting Studies* 21 (3), 859-897.

Cahan, S.F. 1992. The effect of antitrust investigations on discretionary accruals: a refined test of the political-cost hypothesis. *The Accounting Review* 67 (1), 77-95.

Calegari, M.J. 2000. The effect of tax accounting rules on capital structure and discretionary accruals. *Journal of Accounting and Economics* 30 (1), 1-31.

Call, A.C., S. Chen, B. Miao and Y.H. Tong. 2014. Short-term earnings guidance and accrual-based earnings management. *Review of Accounting Studies* 19 (2), 955-987.

Callen, J.L. and D. Segal. 2004. Do accruals drive firm-level stock returns? A variance decomposition analysis. *Journal of Accounting Research* 42 (3), 527-560.

Casey, R., F. Gao, M. Kirschenheiter, S. Li and S. Pandit. 2017. Articulation-based accruals. *Review of Accounting Studies*, forthcoming.

Chan, L.H., K.C.W. Chen, T.Y. Chen and Y.X. Yu. 2015. Substitution between real and accruals-based earnings management after voluntary adoption of compensation clawback provisions. *The Accounting Review* 90 (1), 147-174.

Chen, C.Y., C.J. Lin and Y.C. Lin. 2008. Audit partner tenure, audit firm tenure, and discretionary accruals: Does long auditor tenure impair earnings quality? *Contemporary Accounting Research* 25 (2), 415-445.

Cheng, C.S.A. and W.B. Thomas. 2006. Evidence of the abnormal accrual anomaly incremental to operating cash flows. *The Accounting Review* 81 (5), 1151-1167.

Chichernea, D.C., A.D. Holder and A. Petkevich. 2015. Does return dispersion explain the accrual and investment anomalies? *Journal of Accounting and Economics* 60 (1), 133-148.

Chu, J. 2012. Accruals, growth, and future firm performance. *SSRN* working paper 1999685.

Chung, H.S. and S. Kallapur. 2003. Client importance, nonaudit services, and abnormal accruals. *The Accounting Review* 78 (4), 931-955.

Cohen, D.A., A. Dey and T.Z. Lys. 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *The Accounting Review* 83 (3), 757-787.

Cohen, D.A. and T.Z. Lys. 2006. Weighing the evidence on the relation between external corporate financing activities, accruals and stock returns. *Journal of Accounting and Economics* 42 (1-2), 87-105.

Cohen, D.A. and P. Zarowin. 2010. Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics* 50 (1), 2-19.

Collins, D.W., G.J. Gong and P. Hribar. 2003. Investor sophistication and the mispricing of accruals. *Review of Accounting Studies* 8 (2-3), 251-276.

Collins, D.W. and P. Hribar. 2000. Earnings-based and accrual-based market anomalies: one effect or two? *Journal of Accounting and Economics* 29 (1), 101-123.

Core, J.E., W.R. Guay and R. Verdi. 2008. Is accruals quality a priced risk factor? *Journal of Accounting and Economics* 46 (1), 2-22.

Dhaliwal, D., V. Naiker and F. Navissi. 2010. The association between accruals quality and the characteristics of accounting experts and mix of expertise on audit committees. *Contemporary Accounting Research* 27 (3), 787-827.

Dechow, P.M. 1994. Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics* 18, 3-42.

Dechow, P.M. and I.D. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 22 (Suppl.), 35-59.

Dechow, P.M. and W. Ge. 2006. The persistence of earnings and cash flows and the role of special items: Implications for the accrual anomaly. *Review of Accounting Studies* 11 (2-3), 253-296.

Dechow, P.M., W. Ge, C.R. Larson, and R.G. Sloan. 2011. Predicting material accounting misstatements. *Contemporary accounting research*, *28*(1), pp.17-82.

DeFond, M.L. and J. Jiambalvo. 1994. Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics* 17 (1-2), 145-176.

DeFond, M.L. and K.R. Subramanyam. 1998. Auditor changes and discretionary accruals. *Journal of Accounting and Economics* 25 (1), 35-67.

DeFond, M.L. and C.W. Park. 2001. The reversal of abnormal accruals and the market valuation of earnings surprises. *The Accounting Review* 76 (3), 375-404.

Desai, H.M., S. Rajgopal and M. Venkatachalam. 2004. Value-glamour and accruals mispricing: One anomaly or two? *The Accounting Review* 79 (2), 355-385.

Doyle, J.T., W. Ge and S. McVay. 2007. Accruals quality and internal control over financial reporting. *The Accounting Review* 82 (5), 1141-1170.

Drake, M.S. and L.A. Myers. 2011. Analysts' accrual-related over-optimism: do analyst characteristics play a role? *Review of Accounting Studies* 16 (1), 59-88.

Ecker, F., J. Francis, P. Olsson and K. Schipper. 2013. Estimation sample selection for discretionary accruals models. *Journal of Accounting and Economics* 56 (2-3), 190-211.

Fairfield, P.M., S. Whisenant and T.L. Yohn. 2003. The differential persistence of accruals and cash flows for future operating income versus future profitability. *Review of Accounting Studies* 8 (2-3), 221-243.

Feldman, R., S. Govindaraj, J. Livnat and B. Segal. 2011. Management's tone change, post earnings announcement drift and accruals. *Review of Accounting Studies* 15 (4) 915-953.

Francis, J., R. LaFond, P. Olsson and K. Schipper. 2005. The market pricing of accruals quality. *Journal of Accounting and Economics* 39 (2), 295-327.

Francis, J. and M. Smith. 2005. A reexamination of the persistence of accruals and cash flows. *Journal of Accounting Research* 43 (3), 413-451.

Frankel, R., J. Jennings and J. Lee. 2016. Using unstructured and qualitative disclosures to explain accruals? *Journal of Accounting and Economics* 62 (2-3), 209-227.

Geiger, M.A. and D.S. North. 2006. Does hiring a new CFO change things? An investigation of changes in discretionary accruals. *The Accounting Review* 81 (4), 781-809.

Givoly, D. and C. Hayn. 2000. The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics* 29 (3), 287-320.

Gong, G., L.Y. Li and H. Xie. 2009. The association between management earnings forecast errors and accruals. *The Accounting Review* 84 (2), 497-530.

Guay, W.R., S.P. Kothari and R.L Watts. 1996. A market-based evaluation of discretionary accrual models. *Journal of Accounting Research* 34 (Suppl.), 83-105.

Gul, F.A., C.J.P. Chen and J.S.L. Tsui. 2003. Discretionary accounting accruals, managers' incentives, and audit fees. *Contemporary Accounting Research* 20 (3), 441-464.

Guo, J. and X. Jiang. 2011. Accruals and the conditional equity premium. *Journal of Accounting Research* 49 (1), 187-221.

Hanlon, M. 2005. The persistence and pricing of earnings, accruals, and cash flows when firms have large book-tax differences. *The Accounting Review* 80 (1), 137-166.

Heninger, W.G. 2001. The association between auditor litigation and abnormal accruals. *The Accounting Review* 76 (1), 111-126.

Hafzalla, N., R. Lundholm and E.M Van Winkle. 2011. Percent accruals. *The Accounting Review* 86 (1), 209-236.

Healy, P.M. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7 (1-3), 85–107.

Hribar, P. and D.W. Collins. 2002. Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40 (1), 105-134.

Hribar, P. and N. Yehuda. 2015. The mispricing of cash flows and accruals at different life-cycle stages. *Contemporary Accounting Research* 32 (3), 1053-1072.

Hou, Yu. 2015. The role of diversification in the pricing of accruals quality. *Review of Accounting Studies* 20 (3), 1059-1092.

Hui, K.W., K.K. Nelson and P.E. Yeung. 2016. On the persistence and pricing of industry-wide and firm-specific earnings, cash flows, and accruals. *Journal of Accounting and Economics* 61 (1), 185-202.

Jones, J.J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2), 193-228.

Jones, K.L., G.V. Krishnan and K.D. Melendrez. 2008. Do models of discretionary accruals detect actual cases of fraudulent and restated earnings? An empirical analysis. *Contemporary Accounting Research* 25 (2), 499-531.

Kang, Q., Q. Liu and R. Qi. 2010. Predicting stock market returns with aggregate discretionary accruals. *Journal of Accounting Research* 48 (4), 815-858.

Keung, E. and M.S.H. Shih. 2014. Measuring discretionary accruals: are ROA-matched models better than the original Jones-type models? *Review of Accounting Studies* 19 (2), 736-76.

Khan, M. 2008. Are accruals mispriced? Evidence from tests of an intertemporal capital asset pricing model. *Journal of Accounting and Economics* 45 (1), 55-77.

Kim, D. and Y. Qi. 2010. Accruals quality, stock returns, and macroeconomic conditions. *The Accounting Review* 85 (3), 937-978.

Kothari S.P., A.J. Leone and C. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1), 163-197.

Kraft, A., A.J. Leone and C. Wasley. 2006. An analysis of the theories and explanations offered for the mispricing of accruals and accrual components. *Journal of Accounting Research* 44 (2), 293-339.

Kothari, S.P., N. Mizik and S. Roychowdhury. 2016. Managing for the moment: The role of earnings management via real activities versus accruals in SEO valuation. *The Accounting Review* 91 (2), 559-586.

Krishnan, G.V., B. Srinidhi and L.N. Su. 2008. Inventory policy, accruals quality and information risk. *Review of Accounting Studies* 13 (2-3), 369-410.

Kumar, K.R. and G.V. Krishnan. 2008. The value-relevance of cash flows and accruals: The role of investment opportunities. *The Accounting Review* 83 (4), 997-1040.

Larcker, D.F. and S.A. Richardson. 2004. Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research* 42 (3), 625-658.

Lawrence, A., R.G. Sloan and Y. Sun. 2013. Non-discretionary conservatism: Evidence and implications. *Journal of Accounting and Economics* 56 (2), 112-133.

Lev, B. and D. Nissim. 2006. The persistence of the accruals anomaly. *Contemporary Accounting Research* 23 (1), 193-226.

Levi, S. 2008. Voluntary disclosure of accruals in earnings press releases and the pricing of accruals. *Review of Accounting Studies* 13 (1), 1-21.

Lewellen, J. and R.J. Resutek. 2016. The predictive power of investment and accruals. *Review of Accounting Studies* 21 (4), 1046-1080.

Linck, J.S., J. Netter and T. Shu. 2013. Can managers use discretionary accruals to ease financial constraints? Evidence from discretionary accruals prior to investment. *The Accounting Review* 88 (6), 2117-2143.

Lobo, G.J. and I.M. Song. 1989. The incremental information in SFAS No. 33 income disclosures over historical cost income and its cash and accrual components. *The Accounting Review* 64 (2), 329-343.

Louis, H. and D. Robinson. 2005. Do managers credibly use accruals to signal private information? Evidence from the pricing of discretionary accruals around stock splits. *Journal of Accounting and Economics* 39 (2), 361-380.

Louis, H., D. Robinson and A. Sbaraglia. 2008. An integrated analysis of the association between accrual disclosure and the abnormal accrual anomaly. *Review of Accounting Studies* 13 (1), 23-54.

Louis, H. and A.X. Sun. 2016. Abnormal accruals and managerial intent: Evidence from the timing of merger announcements and completions. *Contemporary Accounting Research* 33 (3), 1101-1135.

Marquardt, C.A. and C.I. Wiedman. 2004. How are earnings managed? An examination of specific accruals. *Contemporary Accounting Research* 21 (2), 461-491.

Mashruwala, C. and S. Mashruwala. 2011. The pricing of accruals quality: January vs. the rest of the year. *The Accounting Review* 86 (4), 1349-1381.

Mashruwala, C., S. Rajgopal and T. Shevlin. 2006. Why is the accrual anomaly not arbitraged away? The role of idiosyncratic risk and transaction costs. *Journal of Accounting and Economics* 42 (1-2), 3-33.

McInnis, J. and D.W. Collins. 2011. The effect of cash flow forecasts on accrual quality and benchmark beating. *Journal of Accounting and Economics* 51 (3), 219-239.

McNichols, M.F. 2002. Discussion of the quality of accruals and earnings: the role of accrual estimation errors. *The Accounting Review* 77 (Suppl.), 61-69.

Miao, B., S.H. Teoh and Z. Zhu. 2016. Limited attention, statement of cash flow disclosure, and the valuation of accruals. *Review of Accounting Studies* 21 (2), 473-515.

Mohanram, P.S. 2014. Analysts' cash flow forecasts and the decline of the accruals anomaly. *Contemporary Accounting Research* 31 (4), 1143-1170.

Momente, F, F. Reggiani and S. Richardson. 2015. Accruals and future performance: Can it be attributed to risk? *Review of Accounting Studies* 20 (4), 1297-1333.

Ogneva, M. 2012. Accrual quality, realized returns, and expected returns: the importance of controlling for cash flow shocks. *The Accounting Review* 87 (4), 1415-1444.

Ohlson, J.A. 2014. Accruals: An overview. *China Journal of Accounting Research*, 7 (2), 65-80.

Ohlson, J.A. and P. Bilinski. 2015. Risk versus anomaly: A new methodology applied to accruals. *The Accounting Review* 90 (5), 2057-2077.

Penman, S.H. and N. Yehuda. 2009. The pricing of earnings and cash flows and an affirmation of accrual accounting. *Review of Accounting Studies* 14 (4), 453-479.

Pincus, M. and S. Rajgopal. 2002. The interaction between accrual management and hedging: Evidence from oil and gas firms. *The Accounting Review* 77 (Suppl.), 127-160.

Pincus, M., S. Rajgopal and M. Venkatachalam. 2007. The accrual anomaly: International evidence. *The Accounting Review* 82 (10), 169-203.

Pfeiffer, R.J. Jr., P.T. Elgers, M.H. Lo, and L.L. Rees. 1998. Additional evidence on the incremental information content of cash flows and accruals: The impact of errors in measuring market expectations. *The Accounting Review* 73 (3), 373-385.

Pfeiffer, R.J. Jr. and P.T. Elgers. 1999. Controlling for lagged stock price responses in pricing regressions: an application to the pricing of cash flows and accruals. *Journal of Accounting Research* 37 (1), 239-247.

Radhakrishnan, S. and S. Wu. 2014. Analysts' cash flow forecasts and accrual mispricing. *Contemporary Accounting Research* 31 (4), 1191-1219.

Ramanna, K. and S. Roychowdhury. 2010. Elections and discretionary accruals: Evidence from 2004. *Journal of Accounting Research* 48 (2), 445-475.

Rayburn, J. 1986. The association of operating cash flow and accruals with security returns. *Journal of Accounting Research* 24 (Suppl.), 112-133.

Rees, L., S. Gill, and R. Gore. 1996. An investigation of asset write-downs and concurrent abnormal accruals. *Journal of Accounting Research* 34 (Suppl.), 157-169.

Resutek, R.J. 2010. Intangible returns, accruals, and return reversal: a multiperiod examination of the accrual anomaly. *The Accounting Review* 85 (4), 1347-1374.

Richardson, S.A., R.G. Sloan, M.T. Soliman and I. Tuna. 2005. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics* 39 (3), 437-485.

Richardson, S.A., R.G. Sloan, M.T. Soliman and I. Tuna. 2006. The implications of accounting distortions and growth for accruals and profitability. *The Accounting Review* 81 (3), 713-743.

Ryan, S.G., J.W. Tucker and P.A. Zarowin. 2006. Classification and market pricing of the cash flows and accruals on trading positions. *The Accounting Review* 81 (2), 443-472.

Shi, L. and H. Zhang. 2012. Can the earnings fixation hypothesis explain the accrual anomaly? *Review of Accounting Studies* 17 (1), 1-21.

Sloan, R.G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71 (3), 289-315.

Srinidhi, B.N. and F.A. Gul. 2007. The differential effects of auditors' nonaudit and audit fees on accrual quality. *Contemporary Accounting Research* 24 (2), 595–629.

Subramanyam, K.R. 1996. The pricing of discretionary accruals. *Journal of Accounting and Economics* 22 (1-3), 313-325.

Wilson, G.P. 1986. The relative information content of accruals and cash flows: combined evidence at the earnings announcement and annual report release date. *Journal of Accounting Research* 24 (Suppl.), 165-200.

Wilson, G.P. 1987. The incremental information content of the accrual and funds components of earnings after controlling for earnings. *The Accounting Review* 62 (2), 293-322.

Wongsunwai, W. 2013. The effect of external monitoring on accruals-based and real earnings management: Evidence from venture-backed initial public offerings. *Contemporary Accounting Research* 30 (1), 296-324.

Wu, J., L. Zhang, and X.F. Zhang. 2010. The q-theory approach to understanding the accrual anomaly. *Journal of Accounting Research* 48 (1), 177–223.

Xie, H. 2001. The mispricing of abnormal accruals. *The Accounting Review* 76 (3), 357-373.

Xu. W. 2010. Do management earnings forecasts incorporate information in accruals? *Journal of Accounting and Economics* 49 (3), 227-246.

Zang, A. 2012. Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review* 87 (2), 675-703.

Zhang, X.F., 2007. Accruals, investment, and the accrual anomaly. *The Accounting Review 82* (5), 1333-1363.

Zhu, W. 2016. Accruals and price crashes. *Review of Accounting Studies* 21 (2), 349-399.

APPENDIX

Variable Definitions

Variable	Definition
Comprehensive accruals, cash flows, and earnings	
$COMPACC_{i,t}$	Comprehensive accruals using the balance sheet approach Calculated as $\Delta CEQ - \Delta CHE$
$CF_{i,t}$	Comprehensive cash flows Calculated as $EARN - COMPACC$
$EARN_{i,t}$	Comprehensive earnings Calculated as $CITOTAL - DVP + STKCO$, or as $NI - DVP + STKCO$ if $CITOTAL$ is missing. Missing DVP is treated as 0.
First decomposition of comprehensive accruals per Equations (5) and (6)	
$OPACC_{i,t}$	Operating accruals using the balance sheet approach Calculated as $(\Delta AT - \Delta CHE - \Delta IVAEQ - \Delta IVAO) - (\Delta LT - \Delta DLC - \Delta DLTT)$
$WCACC_{i,t}$	Working capital accruals using the balance sheet approach Calculated as $(\Delta ACT - \Delta CHE) - (\Delta LCT - \Delta DLC)$
$LTACC_{i,t}$	Long term accruals using the balance sheet approach Calculated as $OPACC - WCACC$
$FINACC_{i,t}$	Financial accruals Calculated as $COMPACC - OPACC$
Second decomposition of comprehensive accruals per Equations (7) and (8), additional variables	
$CC\_ACC_{i,t}$	Conditionally conservative articulating accruals from the statement of cash flows Calculated as $\min((-FOPO + TXBCO + STKCO,0)) + \min((XIDO - XIDOC),0)$, where $\min(x,y)$ is the minimum of x and y. Missing variables are treated as 0. *FOPO* is funds from operations, other/not classified elsewhere. *TXBCO* is the excess tax benefits of stock options reported in the operating activities section of the cash flow statement. *STKCO* is the stock compensation expense. *XIDO* is extraordinary items and discontinued operations from the income statement. *XIDOC* is extraordinary items and discontinued operations from the statement of cash flows.
$NA\_ACC_{i,t}$	Non-articulating accruals Calculated as $OPACC - (NI - DVP + STKCO - OANCF - (IVNCF + IVCH - SIV - IVSTCH))$
$OA\_OPACC_{i,t}$	Other articulating operating accruals Calculated as $OPACC - CC\_ACC – NA\_ACC$
$OA\_WCACC_{i,t}$	Other articulating working capital accruals Calculated as $-RECCH - INVCH - APALCH - TXACH - AOLOCH$
$OA\_LTACC_{i,t}$	Other articulating long-term accruals Calculated as $OA\_OPACC - OA\_WCACC$
Accrual model variables	
$EMPGR_{i,t}$	Annual percentage employee growth
$PL\_MTLB_{i,t}$	The piecewise linear transformation of *MTLB* Calculated as $MTLB - 1$ if $MTLB<1$, or 0 otherwise; where *MTLB* is the market-to-lagged-book ratio of assets, calculated as $(CSHO_t * PRCC\_F_t - CEQ_{t-1} + AT_{t-1}) / AT_{t-1}$
Net capital intensity variants	
$NCA_{i,t}$	Net comprehensive assets Calculated as $CEQ - CHE$
$NOA_{i,t}$	Net operating assets Calculated as $(AT - CHE - IVAEQ - IVAO) - (LT - DLC -DLTT)$
$NOA^{WC}_{i,t}$	Net working capital assets, which is the current portion of *NOA* Calculated as $(ACT - CHE) - (LCT - DLC)$

$NOA^{LT}_{i,t}$	Net long-term operating assets, which is the non-current portion of *NOA* Calculated as *NOA - NWCA*
$NFA_{i,t}$	Net financial assets Calculated as *NCA - NOA*
Asset and liability components of accruals	
$COMPACC\_A_{i,t}$	The asset component of comprehensive accruals Calculated as *ΔAT - ΔCHE*
$COMPACC\_L_{i,t}$	The liability component of comprehensive accruals Calculated as *COMPACC - COMPACC_A*
$OPACC\_A_{i,t}$	The asset component of operating accruals Calculated as *ΔAT - ΔCHE - ΔIVAEQ - ΔIVAO*
$OPACC\_L_{i,t}$	The liability component of operating accruals Calculated as *OPACC - OPACC_A*
$WCACC\_A_{i,t}$	The asset component of working capital accruals Calculated as (*ΔACT - ΔCHE)*
$WCACC\_L_{i,t}$	The liability component of working capital accruals Calculated as *WCACC - WCACC_A*
$LTACC\_A_{i,t}$	The asset component of long-term operating accruals Calculated as *OPACC_A - WCACC_A*
$LTACC\_L_{i,t}$	The liability component of long-term operating accruals Calculated as *LTACC - LTACC_A*
$FINACC\_A_{i,t}$	The asset component of financial accruals Calculated as *ΔIVAEQ + ΔIVAO*
$FINACC\_L_{i,t}$	The liability component of financial accruals Calculated as *FINACC - FINACC_A*

All variables except *EMPGR* and *PL_MTLB* are scaled by average total assets.

The two decompositions of comprehensive accruals states that accruals are comprised of operating and financial accruals: *COMPACC = OPACC + FINACC*. Under the first decomposition, operating accruals are decomposed into its working capital component and its long-term component. For reference, the two decompositions are reproduced here.

First decomposition:

COMPACC = (WCACC + LTACC) + FINACC
where *OPACC = WCACC + LTACC*

Alternatively, under the second decomposition, operating accruals are decomposed into its conditionally conservative component, non-articulation component and 'other articulating' operating component. 'Other articulating' operating accruals are composed of its 'other articulating' working capital component and its 'other articulating' long-term component.

Second decomposition:

COMPACC = (CC_ACC + NA_ACC + OA_OPACC) + FINACC
where *OPACC = CC_ACC + NA_ACC + OA_OPACC* and *OA_OPACC = OA_WCACC + OA_LTACC*

EXHIBIT 1

Piecewise Linear Transformation of Market-to-Lagged-Book (PL_MTLB)

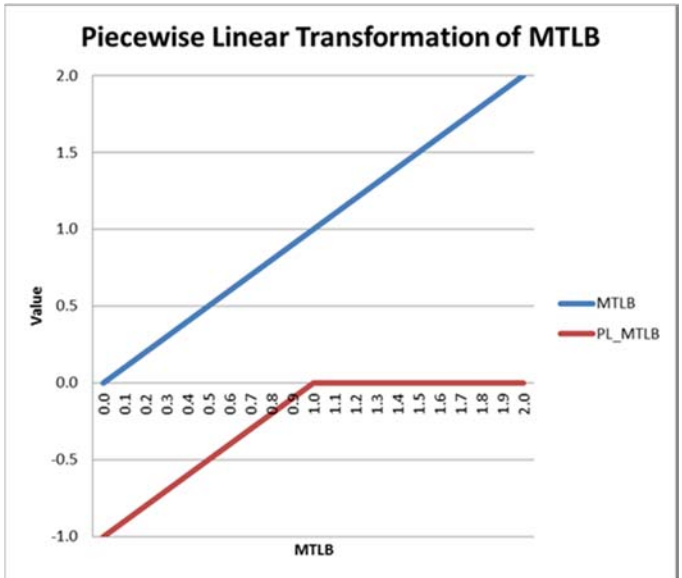
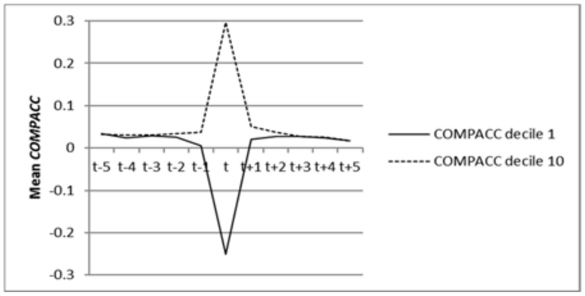


Exhibit 1 depicts the piecewise linear transformation variable (*PL_MTLB*) that is used to model conditionally conservative accruals. *PL_MTLB* takes the value of *MTLB*-1 when *MTLB*<1 and takes the value of zero when *MTLB*>1. *MTLB* is the market-to-lagged-book ratio of assets.

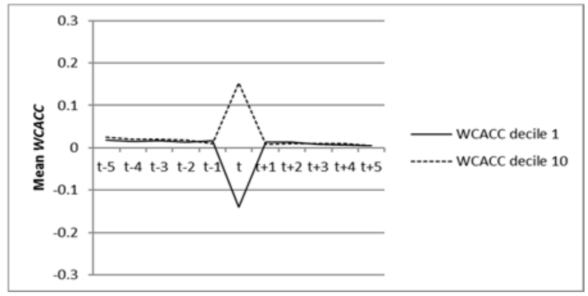
FIGURE 1

Time Series of Accruals by Top and Bottom Deciles of Accruals

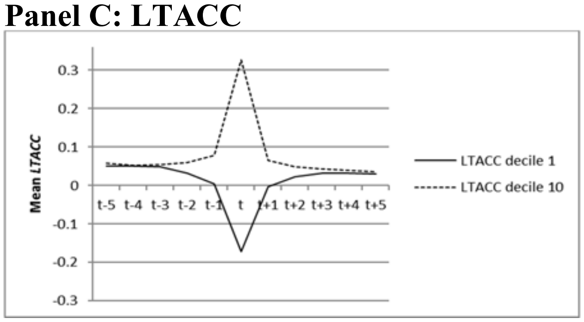
Panel A: COMPACC



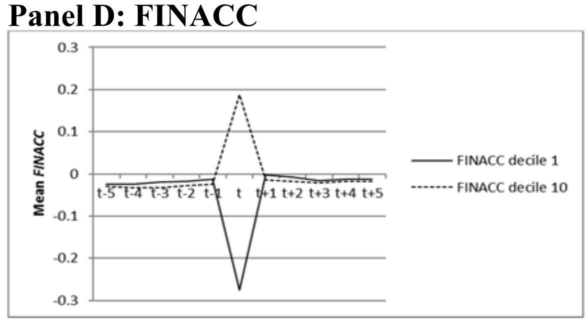
Panel B: WCACC



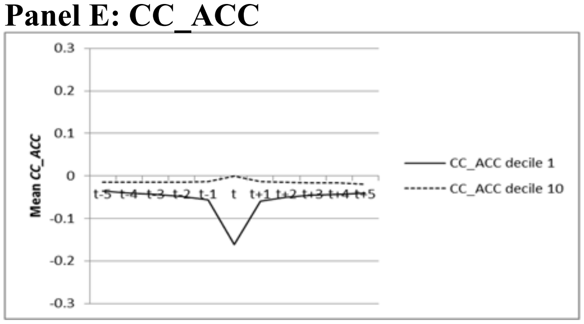
Panel C: LTACC



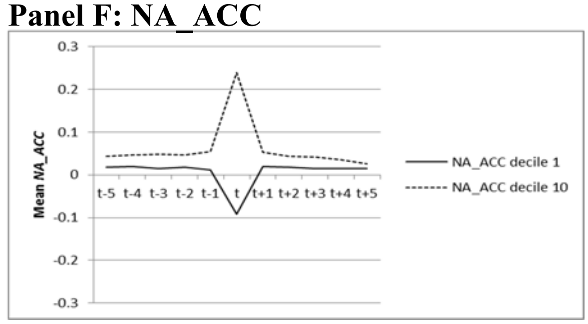
Panel D: FINACC



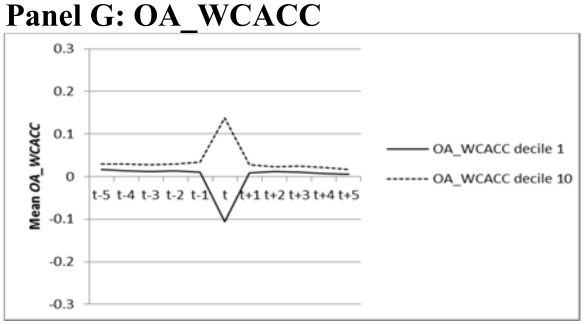
Panel E: CC_ACC



Panel F: NA_ACC



Panel G: OA_WCACC



Panel H: OA_LTACC

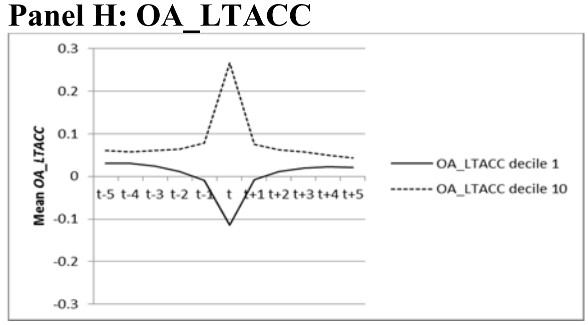
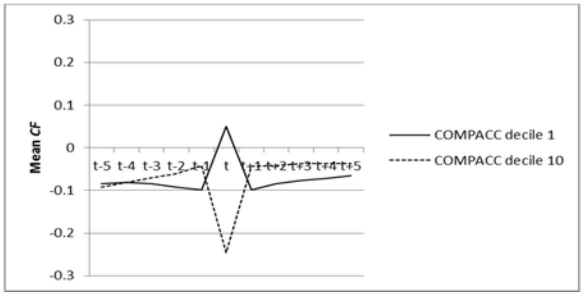


Figure 1 presents the time series of mean accruals, using the various components of accruals from our two decompositions, from five years before the partition event to five years after. Year *t* is when decile portfolios are formed based on the partitioning accruals variable. The sample consists of 76,541 observations from 1988 to 2014.

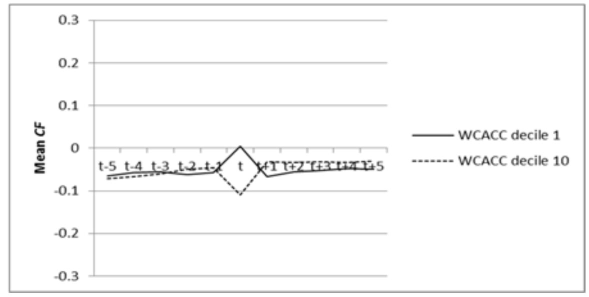
FIGURE 2

Time Series of Cash Flows (CF) by Top and Bottom Deciles of Accruals

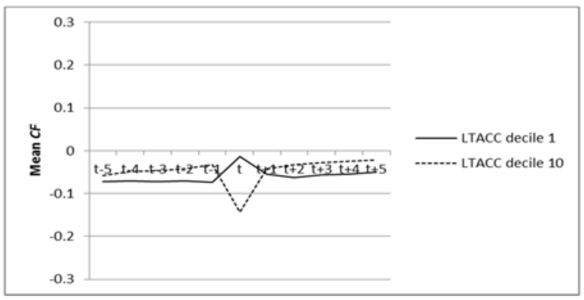
Panel A: COMPACC



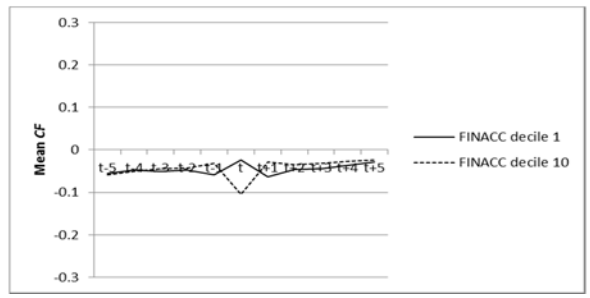
Panel B: WCACC



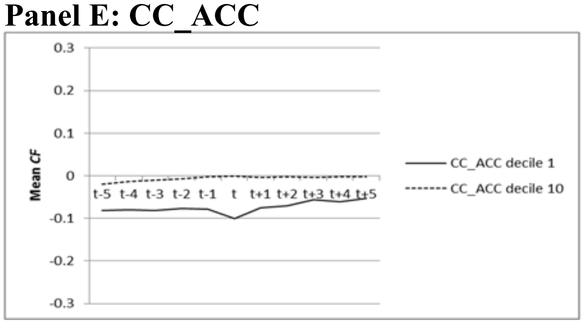
Panel C: LTACC



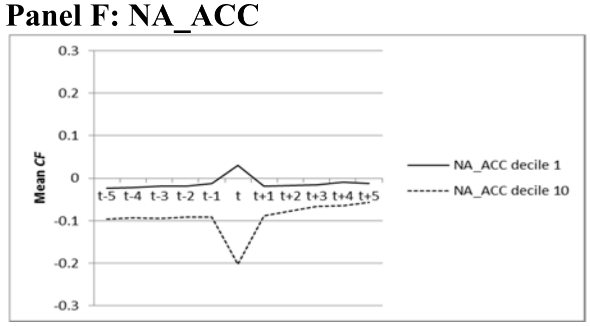
Panel D: FINACC



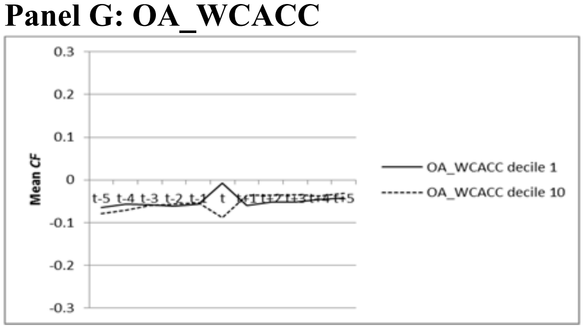
Panel E: CC_ACC



Panel F: NA_ACC



Panel G: OA_WCACC



Panel H: OA_LTACC

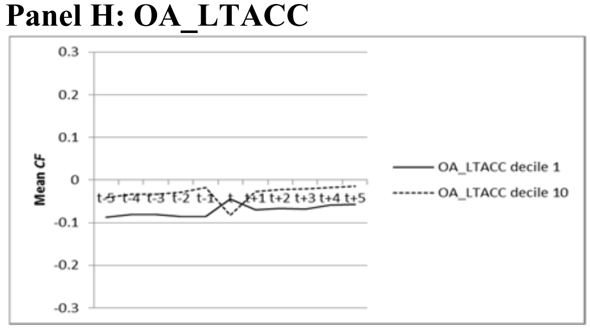
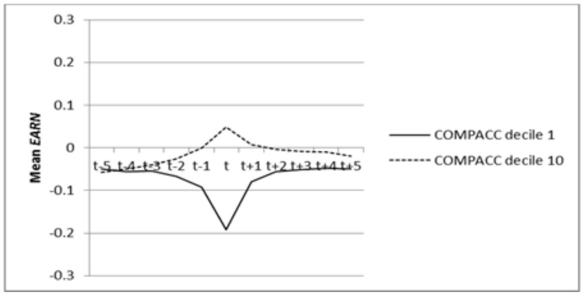


Figure 2 presents the time series of mean comprehensive cash flows (*CF*) from five years before the partition event to five years after. Year *t* is when decile portfolios are formed based on the partitioning accruals variable. The sample consists of 76,541 observations from 1988 to 2014.

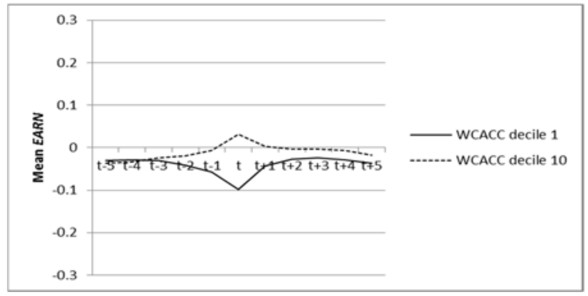
FIGURE 3

Time Series of Comprehensive Earnings (EARN) by Top and Bottom Deciles of Accruals

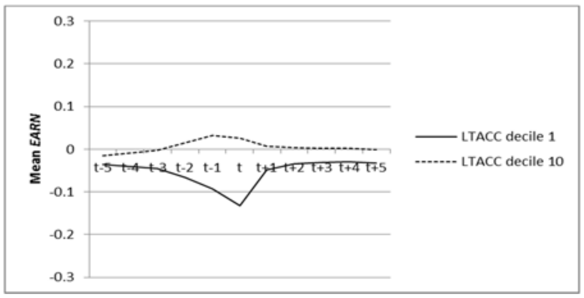
Panel A: COMPACC



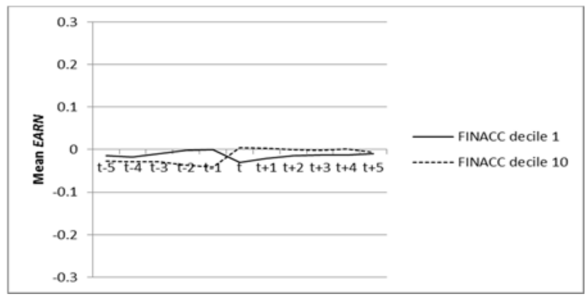
Panel B: WCACC



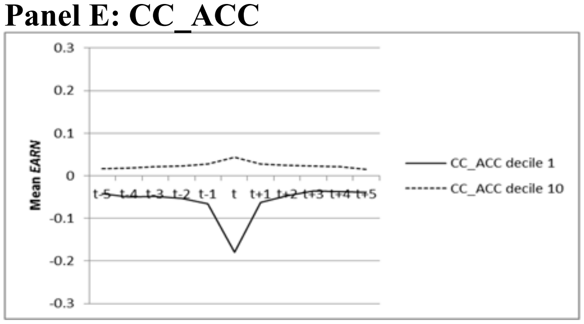
Panel C: LTACC



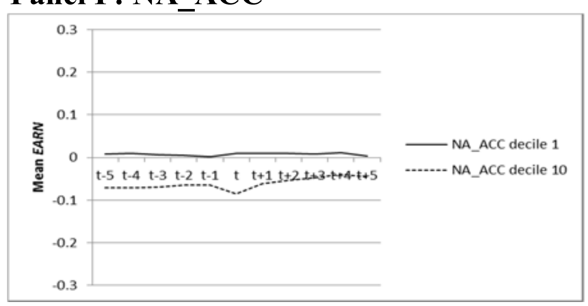
Panel D: FINACC



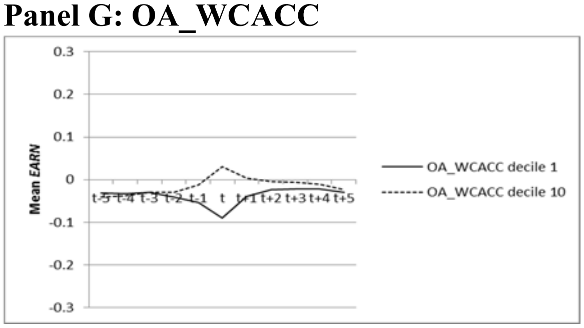
Panel E: CC_ACC



Panel F: NA_ACC



Panel G: OA_WCACC



Panel H: OA_LTACC

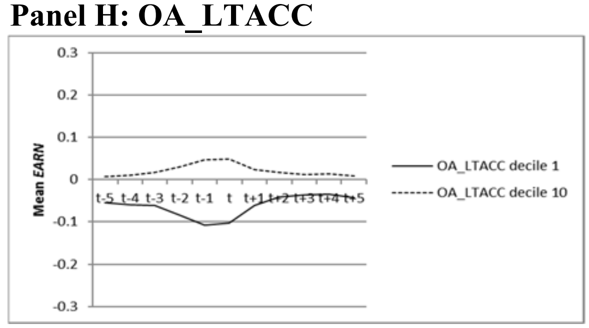


Figure 3 presents time series of mean comprehensive earnings (*EARN*) from five years before the partition event to five years after. Year *t* is when decile portfolios are formed based on the partitioning accruals variable. The sample consists of 76,541 observations from 1988 to 2014.

TABLE 1

Survey of Prior Accrual Measures

Group 1: Working capital accruals, before/excluding depreciation	
1A. Balance sheet approach	
(ΔACT - ΔCHE) - (ΔLCT - ΔDLC)	Baber, Kang and Li (2011)
	Bushman, Lerman and Zhang (2016)
	Core, Guay and Verdi (2008)
	DeFond and Park (2001)
	Geiger and North (2006)
	Hou (2015)
	Kim and Qi (2010)
	Lewellen and Resutek (2016)
	Lobo and Song (1989)
	Mashruwala and Mashruwala (2011)
	Mohanram (2014)
	Momente, Reggiani and Richardson (2015)
	Ogneva (2012)
	Resutek (2010)
	Richardson, Sloan, Soliman and Tuna (2005)
	Srinidhi and Gul (2007)
	Wilson (1986; 1987)
	Wongsunwai (2013)
(ΔACT - ΔCHE) - (ΔLCT - ΔDLC - ΔTXP)	Allen, Larson and Sloan (2013)
	Byzalov and Basu (2016)
ΔRECT + ΔINVT + ΔACO - ΔAP - ΔTXP - ΔLCO	Bowen, Burgstahler and Daley (1987)
	Dechow (1994)
	Pfeiffer, Elgers, Lo and Rees (1998)
	Pfeiffer and Elgers (1999)
ΔRECT + ΔINVT - ΔAP	Bernard and Stober (1989)
ΔRECT + ΔINVT + ΔXPP - ΔAP -ΔTXP	Givoly and Hayn (2000)
1B. Cash flow approach	
- (RECCH + INVCH + APALCH + TXACH + AOLOCH)	Bradshaw, Richardson and Sloan (2001)
	Cheng and Thomas (2006)
	Dechow and Dichev (2002)
	Dhaliwal, Naiker and Navissi (2010)
	Doyle, Ge and McVay (2007)
	Drake and Myers (2011)
	Frankel, Jennings and Lee (2016)
	Gong, Li and Xie (2009)
	Jones, Krishnan and Melendrez (2008)
	Levi (2008)
	McNichols (2002)
Group 2: Working capital accruals, after/including depreciation	
2A. Balance sheet approach	
(ΔACT - ΔCHE) - (ΔLCT - ΔDLC - ΔTXP) - DP	Ali, Chen, Yao and Yu (2008)
	Beneish and Vargus (2002)
	Chichernea, Holder and Petkevich (2015)
	Desai, Rajgopal and Venkatachalam (2004)
	Guo and Jiang (2011)
	Kang, Liu and Qi (2010)
	Khan (2008)
	Kraft, Leone and Wasley (2006)

	Lev and Nissim (2006)
	Mashruwala, Rajgopal and Shevlin (2006)
	Ohlson and Bilinski (2015)
	Sloan (1996)
	Wu, Zhang and Zhang (2010)
	Zhang (2007)
(ΔACT - ΔCHE) - (ΔLCT - ΔDLC) - DP	Balsam, Bartov and Marquardt (2002)
	Barth and Hutton (2004)
	Bartov, Gul and Tsui (2000)
	Bhojraj and Swaminathan (2009)
	Calegari (2000)
	Callen and Segal (2004)
	Cohen and Lys (2006)
	Core, Guay and Verdi (2008)
	Ecker, Francis, Olsson and Schipper (2013)
	Francis, LaFond, Olsson and Schipper (2005)
	Francis and Smith (2005)
	Guay, Kothari and Watts (1996)
	Gul, Chen, and Tsui (2003)
	Heninger (2001)
	Hou (2015)
	Keung and Shih (2014)
	Kothari, Leone and Wasley (2005)
	Kothari, Mizik and Roychowdhury (2016)
	Krishnan, Srinidhi and Su (2008)
	Linck, Netter and Shu (2013)
	Louis and Robinson (2005)
	Louis, Robinson and Sbaraglia (2008)
	Pincus, Rajgopal and Venkatachalam (2007)
ΔACT - ΔLCT - ΔTXDITC - DP	Rayburn (1986)
ΔRECT + ΔINVT - ΔAP -ΔTXP - DP - TXDI	Cahan (1992)
ΔRECT + ΔINVT + ΔACO - (ΔLCT - ΔTXP - ΔDLC) - DP	Rees, Gill and Gore (1996)
ΔRECT + ΔINVT + ΔACO - ΔAP - ΔLCO - DP	Arif, Marshall and Yohn (2016)
	Fairfield, Whisenant and Yohn (2003)
2B. Cash flow approach	
- (RECCH + INVCH + APALCH + TXACH + AOLOCH + DPC)	Chung and Kallapur (2003)
	Hribar and Collins (2002)
Group 3: Working capital accruals, with other non-current items	
3A. Before/excluding depreciation	
IBC + DPC - OANCF	Ashbaugh-Skaife, Collins, Kinney and LaFond (2008)
	Burnett, Cripe, Martin and McAllister (2012)
NI + DP - OANCF	Givoly and Hayn (2000)
PI - (OANCF - XIDOC - TXPD)	Hanlon (2005)
Δ(DLC+DLTT+PSTK+TSTKP+DVPA-CHE-IVAO+CEQ+MIB)	Penman and Yehuda (2009)
3B. After/including depreciation	
IBC – OANCF	Ashbaugh-Skaife, Collins, Kinney and LaFond (2008)
	Badertscher, Collins and Lys (2012)
	Ball and Shivakumar (2006)
	Battalio, Lerman, Livnat and Mendenhall (2012)
	Bradshaw, Richardson and Sloan (2001)
	Bushman, Lerman and Zhang (2016)

	Call, Chen, Miao and Tong (2014) Chan, Chen, Chen and Yu (2015) Chen, Lin and Lin (2008) Dechow and Ge (2006) Feldman, Govindaraj, Livnat and Segal (2010) Hui, Nelson and Yeung (2016) Jones, Krishnan and Melendrez (2008) Keung and Shih (2014) Larcker and Richardson (2004) Lev and Nissim (2006) Levi (2008) Louis and Sun (2016) Miao, Teoh and Zhu (2016) Radhakrishnan and Wu (2014)
IBC - (OANCF - XIDOC)	Butler, Leone and Willenborg (2004) Ayers, Jiang and Yeung (2006) Bhojraj and Swaminathan (2009) Cohen, Dey and Lys (2008) Cohen and Zarowin (2010) Collins, Gong and Hribar (2003) Collins and Hribar (2000) Hribar and Collins (2002) Marquardt and Wiedman (2004) McInnis and Collins (2011) Shi and Zhang (2012) Xu (2010) Zang (2012)
IB - (OANCF - XIDOC)	Barth, Cram and Nelson (2001) Cheng and Thomas (2006)
IB - OANCF	Bernard and Skinner (1996) DeFond and Subramanyam (1998) Kumar and Krishnan (2008) Ramanna and Roychowdhury (2010) Subramanyam (1996) Xie (2001)
NI - OANCF	Hafzalla, Lundholm and Van Winkle (2011) Kraft, Leone and Wasley (2006) Ryan, Tucker and Zarowin (2006)
IB - (OANCF + INTPN)	Barth, Clinch and Israeli (2016)
IB - (OIADP - XINT - TXT - (ΔRECT + ΔINVT + ΔACO - ΔAP - ΔTXP - ΔLCO))	Dechow (1994)
NI - (FOPT - ΔRECT - ΔINVT - ΔACO + ΔAP +ΔTXP + ΔLCO)	DeFond and Jiambalvo (1994)
ΔAT - ΔCHE - ΔIVAO - (ΔLT - ΔDLC - ΔDLTT)	Hribar and Yehuda (2015) Mohanram (2014) Momente, Reggiani and Richardson (2015) Richardson, Sloan, Soliman and Tuna (2006)
ΔAT - ΔCHE - (ΔLT - ΔDLC - ΔDLTT)	Lewellen and Resutek (2016) Zhu (2016)
(AT - CHE) - (AT - DLC - DLTT - MIB - PSTK - CEQ)	Wu, Zhang and Zhang (2010)
- (DPC + XIDOC + TXDC + ESUBC + FOPO + SPIIV) + (ΔRECT + ΔINVT + ΔACO -ΔAP - ΔTXP - ΔLCO)	Pincus and Rajgopal (2002)
Group 4: Non-current and other accruals	
(ΔAT - ΔACT - ΔIVAO) - (ΔLT - ΔLCT - ΔDLTT)	Mohanram (2014) Momente, Reggiani and Richardson (2015) Richardson, Sloan, Soliman and Tuna (2005)

(ΔAT - ΔACT) - (ΔLT - ΔLCT - ΔDLTT)	Lewellen and Resutek (2016)
(ΔIVST + ΔIVAO) - (ΔDLTT + ΔDLC + ΔPSTK)	Mohanram (2014) Richardson, Sloan, Soliman and Tuna (2005)
ΔSEQ - ΔCHE + ΔDLC + ΔDLTT	Baber, Kang and Li (2011)
-ΔCHE + ΔDLC + ΔDLTT + ΔCEQ + ΔPSTK + ΔMIB	Bhojraj and Swaminathan (2009)
IB - (OIADP - XINT - TXT)	Dechow (1994)
- (ESUBC + XIDOC + DPC + TXDC + SPPIV + FOPO)	Pfeiffer, Elgers, Lo and Rees (1998) Pfeiffer and Elgers (1999)
DPC + TXDC + ESUBC + SRET + FOPO + (XIDOC - XIDO)	Lewellen and Resutek (2016)
Group 5: Aggregate accruals	
IB - ΔCHE	Dechow (1994)
[ΔAT - ΔCHE - ΔIVAO - (ΔLT - ΔDLC - ΔDLTT)] + (ΔIVST+ΔIVAO) - (ΔDLC + ΔDLTT + ΔPSTK)	Richardson, Sloan, Soliman and Tuna (2005)
IBC - OANCF - INVCF - FINCF + SSTK - PRSTKC - DV	Richardson, Sloan, Soliman and Tuna (2005)

TABLE 2

Summary of Predictions

	Dependent variable =							
	$COMPACC_{i,t}$	$OPACC_{i,t}$	$WCACC_{i,t}$	$LTACC_{i,t}$	$FINACC_{i,t}$	$CC\_ACC_{i,t}$	$NA\_ACC_{i,t}$	$OA\_OPACC_{i,t}$
				Growth in Scale of Operations:				
$EMPGR_{i,t}$	+	+	+	+	-	.	+	+
$EMPGR_{i,t}* NCI_{i,t-1}$	+	+	+	+	+	.	.	+
				Alleviating Timing Differences:				
$CF_{i,t-1-\tau}$	+	+	.	+	+	+	+	+
$CF_{i,t-1}$	+	+	+	+	+	+	+	+
$CF_{i,t}$	-	-	-	-	-	+	-	-
$CF_{i,t+1}$	+	+	+	+	+	+	+	+
$CF_{i,t+1+\tau}$	+	+	.	+	+	+	+	+
				Conditional Conservatism:				
$PL\_MTLB_{i,t}$	+	+	+	+	+	++	.	+

This table summarizes our predictions for the how the growth, timing difference and conditional conservatism roles traditionally attributed to accruals are reflected in the various accrual definitions.

TABLE 3

Summary Statistics

	N	Mean	SD	Min	Q1	Median	Q3	Max
Accruals								
$COMPACC_{i,t}$	76,541	0.025	0.149	-0.564	-0.030	0.024	0.083	0.539
$OPACC_{i,t}$	76,541	0.041	0.174	-0.579	-0.035	0.025	0.103	0.726
$WCACC_{i,t}$	76,541	0.007	0.081	-0.324	-0.024	0.005	0.039	0.308
$LTACC_{i,t}$	76,541	0.034	0.140	-0.439	-0.021	0.013	0.067	0.673
$FINACC_{i,t}$	76,541	-0.016	0.128	-0.578	-0.047	0.000	0.031	0.410
$CC\_ACC_{i,t}$	76,541	-0.026	0.059	-0.394	-0.021	-0.004	0.000	0.000
$NA\_ACC_{i,t}$	76,541	0.023	0.102	-0.307	-0.003	0.004	0.027	0.649
$OA\_OPACC_{i,t}$	76,541	0.045	0.131	-0.364	-0.021	0.030	0.099	0.538
$OA\_WCACC_{i,t}$	76,541	0.012	0.069	-0.228	-0.016	0.008	0.039	0.260
$OA\_LTACC_{i,t}$	76,541	0.033	0.105	-0.260	-0.016	0.014	0.062	0.488
Comprehensive cash flows and comprehensive earnings								
$CF_{i,t}$	76,541	-0.031	0.192	-0.994	-0.054	0.005	0.051	0.377
$CI_{i,t}$	76,541	-0.005	0.191	-1.002	-0.021	0.038	0.084	0.301
Accrual model variables								
$EMPGR_{i,t}$	76,541	0.073	0.290	-0.600	-0.047	0.024	0.130	1.800
$PL\_MTLB_{i,t}$	76,541	-0.033	0.095	-0.930	0.000	0.000	0.000	0.000
Net capital intensity variants								
$NCA_{i,t-1}$	76,541	0.309	0.237	-0.550	0.191	0.331	0.462	0.813
$NOA_{i,t-1}$	76,541	0.505	0.243	-0.440	0.369	0.549	0.680	0.966
$NOA^{WC}_{i,t-1}$	76,541	0.131	0.179	-0.283	0.004	0.103	0.241	0.622
$NOA^{LT}_{i,t-1}$	76,541	0.376	0.219	-0.045	0.205	0.358	0.534	0.928
$NFA_{i,t-1}$	76,541	-0.196	0.219	-0.927	-0.324	-0.169	-0.019	0.621

This table presents the empirical distributions of key variables. See the Appendix for variable definitions. The sample consists of 76,541 observations from 1988 to 2014.

TABLE 4

Spearman and Pearson Correlation Matrix

	Variables										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) $COMPACC_{i,t}$	***0.06******	-0.39***	0.37***	0.67***	0.47***	0.53***	0.23***	0.30***	0.24***	0.52***	0.31***
(2) $CF_{i,t}$	-0.43***	***0.50******	0.68***	-0.26***	-0.15***	-0.23***	-0.10***	0.24***	-0.43***	-0.12***	-0.18***
(3) $EARN_{i,t}$	0.43***	0.48***	***0.70******	0.27***	0.21***	0.20***	0.07***	0.50***	-0.24***	0.28***	0.07***
(4) $OPACC_{i,t}$	0.68***	-0.27***	0.32***	***0.13******	0.57***	0.87***	-0.54***	0.26***	0.49***	0.75***	0.51***
(5) $WCACC_{i,t}$	0.47***	-0.21***	0.22***	0.61***	***-0.01****	0.11***	-0.22***	0.14***	0.14***	0.55***	0.22***
(6) $LTACC_{i,t}$	0.51***	-0.17***	0.29***	0.81***	0.15***	***0.13******	-0.53***	0.22***	0.50***	0.59***	0.50***
(7) $FINACC_{i,t}$	0.17***	-0.07***	0.06***	-0.49***	-0.24***	-0.45***	***0.01****	-0.00	-0.36***	-0.41***	-0.33***
(8) $CC\_ACC_{i,t}$	0.18***	0.10***	0.27***	0.17***	0.11***	0.15***	-0.01***	***0.25******	-0.22***	0.04***	0.04***
(9) $NA\_ACC_{i,t}$	0.19***	-0.26***	-0.07***	0.35***	0.14***	0.35***	-0.28***	-0.15***	***0.13******	-0.03***	0.34***
(10) $OA\_OPACC_{i,t}$	0.56***	-0.20***	0.31***	0.81***	0.57***	0.62***	-0.40***	0.03***	0.00	***0.21******	0.38***
(11) $EMPGR_{i,t}$	0.36***	-0.11***	0.23***	0.50***	0.25***	0.48***	-0.25***	0.08***	0.20***	0.42***	***0.14******

This table presents the correlation matrix for key variables used in the accruals analyses. The Pearson correlation coefficients are reported in the top right, Spearman correlation coefficients are reported in the bottom left and the autocorrelation coefficients are reported along the diagonal in bold italics. See the Appendix for variable definitions. ***, **, and * denote significance at the 1, 5, and 10 percent levels respectively, using *t*-statistics obtained from two-sided tests. The sample consists of 76,541 observations from 1988 to 2014.

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TABLE 5

Results for Modeling Accruals

$$ACC_{i,t} = \alpha_0 + \alpha_1 EMPGR_{i,t} + \alpha_2 EMPGR_{i,t} * NCI_{i,t-1} + \alpha_3 CF_{i.t-2} + \alpha_4 CF_{i.t-1} + \alpha_5 CF_{i.t} + \alpha_6 CF_{i.t+1} + \alpha_7 CF_{i.t+2} + \alpha_8 PL\_MTLB_{i,t} + \varepsilon_{i,t}$$

	Dependent variable =									
	$COMPACC_{i,t}$	*$OPACC_{i,t}$*	*$WCACC_{i,t}$*	*$LTACC_{i,t}$*	*$FINACC_{i,t}$*	*$CC\_ACC_{i,t}$*	*$NA\_ACC_{i,t}$*	*$OA\_OPACC_{i,t}$*	*$OA\_WCACC_{i,t}$*	*$OA\_LTACC_{i,t}$*
Intercept	0.029***	0.031***	0.006***	0.025***	-0.002	-0.020***	0.012***	0.041***	0.012***	0.029***
	(16.952)	(12.273)	(4.898)	(14.907)	(-1.271)	(-28.692)	(10.657)	(14.815)	(8.827)	(16.250)
$EMPGR_{i,t}$	0.050***	0.150***	0.010***	0.138***	-0.165***	-0.017***	0.106***	0.056***	-0.000	0.074***
	(9.736)	(22.040)	(4.217)	(17.190)	(-30.689)	(-5.836)	(24.054)	(8.316)	(-0.150)	(12.158)
*$EMPGR_{i,t}$ * $NCI_{i,t-1}$*	0.218***	0.337***	0.550***	0.250***	-0.000***	0.083***	-0.041***	0.281***	0.342***	0.168***
	(13.807)	(19.597)	(39.165)	(13.062)	(-5.730)	(11.554)	(-4.847)	(20.765)	(27.204)	(12.759)
$CF_{i,t-2}$	0.081***	0.052***	0.008***	0.043***	0.026***	0.010***	0.006*	0.030***	0.003	0.027***
	(12.977)	(6.666)	(3.687)	(6.351)	(5.128)	(3.099)	(1.699)	(7.252)	(1.353)	(7.616)
$CF_{i,t-1}$	0.161***	0.093***	0.021***	0.069***	0.065***	0.019***	0.010***	0.056***	0.013***	0.042***
	(28.024)	(15.390)	(5.393)	(11.365)	(13.299)	(6.081)	(3.441)	(12.752)	(4.280)	(13.357)
$CF_{i,t}$	-0.547***	-0.335***	-0.104***	-0.219***	-0.206***	0.052***	-0.230***	-0.141***	-0.068***	-0.066***
	(-67.800)	(-37.940)	(-17.618)	(-22.771)	(-22.935)	(15.024)	(-20.972)	(-11.350)	(-18.104)	(-7.555)
$CF_{i,t+1}$	0.175***	0.105***	0.051***	0.048***	0.066***	0.013***	0.019***	0.058***	0.029***	0.026***
	(35.660)	(17.689)	(17.490)	(11.123)	(11.482)	(5.240)	(3.314)	(13.144)	(13.416)	(6.056)
$CF_{i,t+2}$	0.123***	0.080***	0.023***	0.054***	0.039***	0.007***	0.021***	0.045***	0.017***	0.026***
	(23.558)	(19.123)	(10.432)	(13.878)	(9.538)	(2.824)	(5.322)	(8.285)	(7.238)	(6.701)
$PL\_MTLB_{i,t}$	0.314***	0.256***	0.066***	0.177***	0.046***	0.107***	0.013**	0.127***	0.061***	0.062***
	(20.094)	(17.499)	(10.455)	(10.941)	(7.865)	(5.489)	(2.459)	(7.508)	(8.779)	(6.091)
N	76,541	76,541	76,541	76,541	76,541	76,541	76,541	76,541	76,541	76,541
Adj. R^2	0.452	0.385	0.176	0.327	0.166	0.119	0.263	0.207	0.094	0.163

This table presents the results of our accruals model, where growth, matching, and asymmetric timeliness roles explain variation in the different definitions of accruals.

The $NCI_{i,t-1}$ variant used to explain the impact of growth on accruals matches the accrual variable on the left-hand side. To explain *COMPACC*, the *NCI* variant used is $NCA_{i,t-1}$, beginning net comprehensive assets. To explain *OPACC*, *CC_ACC*, *NA_ACC* and *OA_OPACC*, the *NCI* variant used is $NOA_{i,t-1}$, beginning net operating assets. To explain *WCACC* and *OA_WCACC*, the *NCI* variant used is $NOA^{WC}_{i,t-1}$, beginning net working capital assets. To explain *LTACC* and *OA_LTACC*, the *NCI* variant used is NOA^{LT}_{it-1}, beginning net long-term operating assets. To explain *FINACC*, the *NCI* variant used is $NFA_{i,t-1}$, net financial assets.

Standard errors are clustered by firm and year. *T*-statistics are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively, based on two-sided tests. The sample consists of 76,541 observations from 1988 to 2014, where *t*-2 is as early as 1986 and *t*+2 is as late as 2016. All variables except *EMPGR* and *PL_MTLB* are scaled by average total assets. See the Appendix for variable definitions.

TABLE 6

Results for Separately Modeling Asset and Liability Accruals

$$\boldsymbol{ACC\_A_{i,t}\ or\ ACC\_L_{i,t} = \alpha_0 + \alpha_1 EMPGR_{i,t} + \alpha_2 CF_{i.t-2} + \alpha_3 CF_{i.t-1} + \alpha_4 CF_{i.t} + \alpha_5 CF_{i.t+1} + \alpha_6 CF_{i.t+2} + \alpha_7 PL\_MTLB_{i,t} + \varepsilon_{i,t}}$$

	Dependent variable =									
	$COMPACC\_A_{i,t}$	$COMPACC\_L_{i,t}$	$OPACC\_A_{it}$	$OPACC\_L_{i,t}$	$WCACC\_A_{i,t}$	$WCACC\_L_{i,t}$	$LTACC\_A_{i,t}$	$LTACC\_L_{i,t}$	$FINACC\_A_{i,t}$	$FINACC\_L_{i,t}$
Intercept	0.051***	-0.022***	0.048***	-0.017***	0.018***	-0.011***	0.030***	-0.006***	0.003***	-0.006***
	(14.027)	(-9.538)	(13.891)	(-12.189)	(7.116)	(-8.619)	(19.100)	(-10.376)	(9.972)	(-3.052)
$EMPGR_{i,t}$	0.381***	-0.279***	0.380***	-0.114***	0.142***	-0.093***	0.232***	-0.016***	-0.001	-0.161***
	(51.896)	(-41.024)	(53.567)	(-41.312)	(25.024)	(-40.528)	(37.921)	(-11.946)	(-0.650)	(-29.725)
$CF_{i,t-2}$	0.050***	0.030***	0.045***	0.006***	0.000	0.007***	0.043***	-0.002***	0.003**	0.020***
	(6.549)	(5.696)	(5.656)	(2.593)	(0.139)	(3.589)	(6.488)	(-2.577)	(2.437)	(4.602)
$CF_{i,t-1}$	0.088***	0.069***	0.072***	0.011***	0.008**	0.010***	0.061***	-0.001	0.012***	0.049***
	(10.413)	(13.182)	(10.213)	(3.444)	(2.286)	(3.663)	(10.194)	(-1.381)	(7.406)	(12.285)
$CF_{i,t}$	-0.325***	-0.213***	-0.269***	-0.037***	-0.063***	-0.031***	-0.196***	0.000	-0.038***	-0.152***
	(-28.852)	(-18.187)	(-27.418)	(-8.625)	(-13.965)	(-10.693)	(-21.077)	(0.099)	(-14.463)	(-16.819)
$CF_{i,t+1}$	0.126***	0.057***	0.103***	0.004*	0.048***	0.005***	0.050***	-0.002**	0.015***	0.047***
	(18.780)	(10.822)	(17.190)	(1.771)	(19.794)	(3.079)	(11.242)	(-2.329)	(8.252)	(9.982)
$CF_{i,t+2}$	0.090***	0.035***	0.080***	-0.001	0.026***	-0.002	0.051***	-0.000	0.006***	0.031***
	(17.241)	(6.867)	(16.271)	(-0.226)	(8.982)	(-0.947)	(12.414)	(-0.175)	(4.084)	(7.441)
$PL\_MTLB_{i,t}$	0.351***	-0.032***	0.325***	-0.053***	0.124***	-0.041***	0.188***	-0.013***	0.019***	0.019***
	(20.067)	(-5.168)	(19.010)	(-11.285)	(15.078)	(-9.765)	(11.635)	(-10.366)	(8.562)	(3.269)
N	76,541	76,541	76,541	76,541	76,541	76,541	76,541	76,541	76,541	76,541
Adj. R^2	0.432	0.247	0.424	0.173	0.243	0.179	0.330	0.030	0.024	0.161

This table presents the results of our accrual model, where growth, matching, and asymmetric timeliness roles explain variation in the different definitions of asset and liability accruals. By separating accruals into its asset and liability components, we allow growth to differentially explain asset-related accruals (denoted *_A*) versus liability-related accruals (denoted *_L*). Standard errors are clustered by firm and year. *T*-statistics are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively, based on two-sided tests. The sample consists of 76,541 observations from 1988 to 2014, where *t*-2 is as early as 1986 and *t*+2 is as late as 2016. All variables except *EMPGR* and *PL_MTLB* are scaled by average total assets. See the Appendix for variable definitions.

TABLE 7

Results for Modeling Accruals with Extra Leading and Lagging Cash Flows

$$COMPACC_{i,t} = \alpha_0 + \alpha_1 EMPGR_{i,t} + \alpha_2 EMPGR_{i,t} * NCA_{i,t-1} + \alpha_3 CF_{i.t-7} + \cdots + \alpha_{11} CF_{i.t} + \cdots + \alpha_{19} CF_{i.t+8} + \alpha_{20} PL\_MTLB_{i,t} + \varepsilon_{i,t}$$

	Dependent variable = *COMPACC*$_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.029***	0.030***	0.031***	0.031***	0.032***	0.032***	0.033***	0.034***
	(16.952)	(17.023)	(16.191)	(14.932)	(13.672)	(12.298)	(13.633)	(14.872)
$EMPGR_{i,t}$	0.050***	0.050***	0.051***	0.045***	0.044***	0.041***	0.031***	0.030***
	(9.736)	(10.011)	(8.614)	(7.129)	(5.911)	(6.141)	(3.956)	(3.969)
$EMPGR_{i,t}$	0.218***	0.206***	0.202***	0.215***	0.226***	0.223***	0.238***	0.253***
$* NCA_{i,t-1}$	(13.807)	(14.780)	(11.277)	(11.088)	(9.214)	(9.457)	(8.897)	(9.998)
$CF_{i,t-8}$							-0.005	
							(-0.695)	
$CF_{i,t-7}$						-0.006	0.002	
						(-0.867)	(0.304)	
$CF_{i,t-6}$					0.004	0.011***	0.007	
					(1.028)	(2.772)	(1.383)	
$CF_{i,t-5}$				-0.000	0.004	0.004	0.009	
				(-0.069)	(0.673)	(0.671)	(1.431)	
$CF_{i,t-4}$			0.009***	0.011***	0.010***	0.012***	0.011*	
			(2.964)	(3.955)	(3.993)	(3.369)	(1.798)	
$CF_{i,t-3}$		0.036***	0.036***	0.033***	0.037***	0.040***	0.045***	
		(10.093)	(7.866)	(5.612)	(5.670)	(5.572)	(7.176)	
$CF_{i,t-2}$	0.081***	0.068***	0.062***	0.065***	0.070***	0.072***	0.070***	0.098***
	(12.977)	(11.367)	(9.700)	(9.942)	(9.691)	(8.406)	(7.138)	(9.216)
$CF_{i,t-1}$	0.161***	0.146***	0.144***	0.144***	0.146***	0.141***	0.134***	0.161***
	(28.024)	(21.979)	(17.010)	(16.246)	(15.036)	(14.439)	(11.171)	(13.262)

$CF_{i,t}$	-0.547***	-0.572***	-0.582***	-0.586***	-0.589***	-0.605***	-0.622***	-0.594***
	(-67.800)	(-61.596)	(-54.102)	(-50.363)	(-48.542)	(-45.727)	(-49.831)	(-47.635)
$CF_{i,t+1}$	0.175***	0.155***	0.145***	0.137***	0.126***	0.117***	0.121***	0.151***
	(35.660)	(25.735)	(24.943)	(20.301)	(17.495)	(13.818)	(12.301)	(17.994)
$CF_{i,t+2}$	0.123***	0.099***	0.087***	0.080***	0.074***	0.075***	0.082***	0.116***
	(23.558)	(17.183)	(14.229)	(11.462)	(9.096)	(8.991)	(9.710)	(13.392)
$CF_{i,t+3}$		0.077***	0.067***	0.063***	0.058***	0.054***	0.050***	
		(12.224)	(10.944)	(9.526)	(6.682)	(5.841)	(4.975)	
$CF_{i,t+4}$			0.048***	0.046***	0.046***	0.045***	0.043***	
			(9.076)	(8.919)	(7.805)	(5.778)	(4.553)	
$CF_{i,t+5}$				0.017**	0.015**	0.022***	0.024***	
				(2.482)	(2.038)	(3.115)	(2.855)	
$CF_{i,t+6}$					0.016**	0.015*	0.016*	
					(2.134)	(1.894)	(1.936)	
$CF_{i,t+7}$						0.012**	0.013	
						(1.977)	(1.530)	
$CF_{i,t+8}$							-0.001	
							(-0.122)	
$PL\_MTLB_{i,t}$	0.314***	0.320***	0.317***	0.318***	0.325***	0.338***	0.333***	0.338***
	(20.094)	(19.427)	(15.858)	(14.591)	(14.161)	(12.662)	(9.773)	(10.403)
N	76,541	64,238	53,503	43,238	34,503	27,131	21,084	21,084
Adj. R^2	0.452	0.470	0.476	0.474	0.483	0.497	0.509	0.497

This table presents the results of regressions of comprehensive accruals (*COMPACC*) on growth, extended cash flow matching, and asymmetric timeliness variables. Standard errors are clustered by firm and year. *T*-statistics are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively, based on two-sided tests. The sample in column (1) consists of 76,541 observations from 1988 to 2014, where *t*-2 is as early as 1986 and *t*+2 is as late as 2016. Subsequent columns' samples are restricted by requiring non-missing intertemporal cash flows. All variables except *EMPGR* and *PL_MTLB* are scaled by average total assets. See the Appendix for variable definitions.

TABLE 8

Explaining Future Comprehensive Earnings with Cash Flows and Accruals

$$EARN_{i,t+1} = \alpha_0 + \alpha_1 CF_{i,t} + \alpha_2 COMPACC_{i.t} + \varepsilon_{i,t}$$

	Dependent variable = $EARN_{,t+1}$				
	(1)	(2)	(3)	(4)	(5)
Intercept	0.002	0.003	0.002	-0.008***	-0.009***
	(0.536)	(0.896)	(0.637)	(-2.867)	(-3.302)
$CF_{i,t}$	0.745***	0.737***	0.736***	0.797***	0.795***
	(71.276)	(71.403)	(73.455)	(70.359)	(68.956)
$COMPACC_{i,t}$	0.566***				
	(33.681)				
$OPACC_{i,t}$		0.538***			
		(33.807)			
$WCACC_{i,t}$			0.546***		
			(33.118)		
$LTACC_{i,t}$			0.559***		
			(31.900)		
$FINACC_{i,t}$		0.582***	0.586***	0.643***	0.647***
		(41.479)	(40.458)	(45.339)	(45.454)
$CC\_ACC_{i,t}$				0.292***	0.287***
				(9.671)	(9.783)
$NA\_ACC_{i,t}$				0.683***	0.677***
				(37.785)	(39.500)
$OA\_OPACC_{i,t}$				0.598***	
				(40.477)	
$OA\_WCACC_{i,t}$					0.558***
					(30.815)
$OA\_LTACC_{i,t}$					0.650***
					(40.727)
N	76,541	76,541	76,541	76,541	76,541
Adj. R^2	0.495	0.487	0.489	0.493	0.492

This table presents the results of regressions of future earnings (*EARN*) on cash flows (*CF*) and accruals, which are decomposed in subsequent columns. Standard errors are clustered by firm and year. *T*-statistics are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively, based on two-sided tests. The sample consists of 76,541 observations from 1988 to 2014, where *t*-2 is as early as 1986 and *t*+2 is as late as 2016. All variables are scaled by average total assets. See the Appendix for variable definitions.

TABLE 9

Explaining Future Stock Returns with Cash Flows and Accruals

$$RET_{i,t+1} = \alpha_0 + \alpha_1 CF_{i,t} + \alpha_2 COMPACC_{i.t} + \varepsilon_{i,t}$$

	Dependent variable = RET_{it+1}				
	(1)	(2)	(3)	(4)	(5)
Intercept	0.204***	0.210***	0.212***	0.196***	0.197***
	(3.895)	(3.994)	(3.993)	(4.150)	(4.165)
CF_{it}	-0.274	-0.270	-0.273	-0.199	-0.199
	(-1.446)	(-1.435)	(-1.447)	(-1.206)	(-1.212)
$COMPACC_{it}$	-0.656***				
	(-2.708)				
$OPACC_{it}$		-0.715***			
		(-2.905)			
$WCACC_{it}$			-0.668***		
			(-2.867)		
$LTACC_{it}$			-0.782***		
			(-2.841)		
$FINACC_{it}$		-0.407*	-0.428*	-0.323*	-0.320*
		(-1.884)	(-1.918)	(-1.858)	(-1.836)
CC_ACC_{it}				-1.270**	-1.263**
				(-2.256)	(-2.245)
NA_ACC_{it}				-0.645**	-0.636**
				(-2.532)	(-2.503)
OA_OPACC_{it}				-0.636***	
				(-3.151)	
OA_WCACC_{it}					-0.713***
					(-3.245)
OA_LTACC_{it}					-0.646***
					(-3.029)
N	75,562	75,562	75,562	75,562	75,562
Adj. R^2	0.009	0.011	0.012	0.013	0.013

Returns are raw 12-month buy-and-hold returns starting from month=+4 after the fiscal year end. Standard errors are clustered by firm and year. *T*-statistics are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively, based on two-sided tests. The sample size is restricted by requiring non-missing RET_{t+1}.

TABLE 10

Explaining the First Year of an AAER Misstatement Event with Cash Flows and Accruals

$$\boldsymbol{AAER1_{i,t} = \alpha_0 + \alpha_1 CF_{i,t} + \alpha_2 COMPACC_{i.t} + \varepsilon_{i,t}}$$

	Dependent variable = $AAER1_{i,t}$				
	(1)	(2)	(3)	(4)	(5)
Intercept	-2.857***	-2.874***	-2.876***	-2.916***	-2.928***
	(-50.158)	(-48.353)	(-48.482)	(-49.039)	(-47.662)
$CF_{i,t}$	0.275**	0.256**	0.235**	0.359***	0.389***
	(2.406)	(2.219)	(2.069)	(2.599)	(2.884)
$COMPACC_{i,t}$	1.003***				
	(5.447)				
$OPACC_{i,t}$		1.028***			
		(6.427)			
$WCACC_{i,t}$			1.400***		
			(3.756)		
$LTACC_{i,t}$			0.914***		
			(5.780)		
$FINACC_{it}$		0.415*	0.372*	0.535**	0.492**
		(1.833)	(1.658)	(2.215)	(2.225)
$CC\_ACC_{i,t}$				-0.050	-0.076
				(-0.160)	(-0.239)
$NA\_ACC_{i,t}$				0.926***	0.909***
				(3.479)	(3.627)
$OA\_OPACC_{i,t}$				1.348***	
				(7.535)	
OA_WCACC_{it}					2.103***
					(4.515)
$OA\_LTACC_{i,t}$					1.198***
					(8.302)
N	76,541	76,541	76,541	76,541	76,541
Likelihood Ratio χ^2	28.55	38.09	41.00	48.45	58.28
Pseudo R^2	0.011	0.015	0.016	0.019	0.022

The dependent variable, *AAER1*, is an indicator variable = 1 if year *t* is the first year of an Accounting and Auditing Enforcement Release misstatement event. Standard errors are clustered by firm and year. *Z*-statistics are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively, based on two-sided tests. McFadden's pseudo R^2 is calculated as $R^2 = 1 - \frac{\ln(L_{model})}{\ln(L_{intercept})}$, where L_{model} is the maximized likelihood value from the specified model and $L_{intercept}$ is the maximized likelihood value from the intercept-only model.