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The predictive power of investment and accruals

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Abstract We test whether investment explains the accrual anomaly by splitting total accruals into investment-related and "nontransaction" accruals, items such as depreciation and asset write-downs that do not represent new investment expenditures. The two types of accruals have very different predictive power for firm performance, not just for future earnings but also for future cash flow and stock returns. Most importantly, nontransaction accruals have the strongest negative predictive slopes for earnings and stock returns, contrary to the predictions of the investment hypothesis. A long-short portfolio based on nontransaction accruals has a significant average return of 0.71 % monthly from 1972 to 2010 and remains profitable at the end of the sample when returns on other accrual strategies decline. Our results suggest that nontransaction accruals are the least reliable component of accruals and show that a significant portion of the accrual anomaly cannot be explained by investment.

Keywords Earnings persistence · Accruals · Investment · Stock returns · Anomalies

JEL Classification G14 · M41

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1 Introduction

The accrual anomaly is one of the strongest and most striking asset-pricing anomalies. Sloan (1996) shows that accruals, measured in his paper as changes in working capital minus depreciation, have strong predictive power for stock returns after controlling for a firm's size, beta, and other characteristics. Stocks in the bottom accrual decile outperform those in the top accrual decile by roughly 10 % annually, a result that has been confirmed in numerous follow-up studies.

The source of the accrual anomaly continues to be the subject of much debate. The literature offers two primary explanations, one emphasizing the link between accruals and earnings and the other emphasizing the link between accruals and investment. Distinguishing between the two is important both to clarify the economic forces underlying the anomaly and to understand better how investors use, and possibly misuse, accounting numbers.

Sloan (1996) proposes the first explanation, based on the idea that accruals inject transitory "distortions" into the earnings process. He shows that accruals are significantly less persistent than cash flows and, controlling for the level of earnings today, firms with higher accruals tend to have lower subsequent profits. Sloan suggests that investors do not understand this relation and consequently overvalue stocks with high accruals and undervalue stocks with low accruals. The strongest version of this hypothesis says that investors fixate on a firm's total earnings and do not differentiate at all between cash flows and accruals, so this hypothesis is sometimes known as the earnings-fixation hypothesis.

Fairfield et al. (2003) propose the second explanation, based on the link between accruals and investment. Fairfield et al. observe that Sloan's accrual variable is a component not only of earnings but also of growth in net operating assets (NOA). They show that changes in long-term NOA have similar predictive power as working-capital accruals. Thus, Fairfield et al. argue that the accrual anomaly reflects a general "growth effect" arising from diminishing marginal returns from investment. An alternative interpretation, emphasized by Fama and French (2006) and Wu et al. (2010), is that accruals and investment simply covary with rational variation in expected stock returns: a lower cost of equity should naturally lead to more investment. In either case, both interpretations of the investment hypothesis suggest that accruals predict stock returns only because they are closely tied to investment.

To date, the empirical literature has not distinguished directly between the two hypotheses above, though a number of studies provide evidence consistent with one or the other. For example, Xie (2001) and Richardson et al. (2005) show that "discretionary" and "less reliable" accruals are the least persistent and most mispriced types of accruals, consistent with idea that investors do not fully understand the earnings-generating process. Dechow and Ge (2006) find that special items help explain the mispricing of low-accrual firms, while Richardson et al. (2006a) show that accruals unrelated to sales growth contribute to the low persistence of accruals, again consistent with Sloan's (1996) earnings hypothesis. On the other hand, Zhang (2007) shows that the accrual anomaly is stronger when accruals are more highly correlated with employment growth, suggesting that growth plays an important role. Dechow et al. (2008) find that accruals and retained cash are similarly mispriced and "conjecture that the accrual anomaly could be driven by … a combination of diminishing marginal returns to new investment and agency-related overinvestment" (p. 539). Khan (2008) and Wu et al. (2010) conclude that accruals are related to risk, consistent with the idea that accruals are linked to investment and rational variation in expected returns.

An important limitation of the literature is that no study explicitly tests whether investment does (or does not) explain their results. For example, changes in long-term NOA—the measure of long-term accruals used by Fairfield et al. (2003), Richardson et al. (2006a) and Dechow et al. (2008)—reflect new investment expenditures made by the firm as well as accruals such as depreciation, asset write-downs, and deferred taxes that are *not* tied to new investment. Thus, ΔLTNOA captures the impact of both new investment and non-investment accounting charges. Similarly, the variables considered by Wu et al. (2010) combine investment- and non-investment-related changes in balance-sheet accounts, making it hard to know whether investment actually explains their findings. In short, existing studies do not explicitly test whether the predictive power of accruals can be traced to investment.

Our goal is to provide a direct test of whether investment explains the accrual anomaly. The key empirical challenge comes from the tight link between investment and accruals, since most investment expenditures have a one-to-one impact on accruals under the principles of historical cost accounting. This link makes it difficult to say whether the accrual anomaly is driven by a firm's underlying investment expenditures (the investment hypothesis) or the way expenditures are accounted for in the firm's financial statements (the earnings hypothesis). However, as noted above, investment and accruals are not identical: while many accruals reflect new investment, others such as depreciation and asset write-downs represent changes in the capitalized value of existing assets that are not tied to new investment transactions. We exploit this wedge between investment and so-called "nontransaction" accruals to test whether investment truly explains the accrual anomaly. As far as we know, our paper is the first to distinguish explicitly between investment-related and non-investment-related accruals.

To be more specific, we break a firm's total accruals (ΔNOA) into working-capital accruals, long-term investment accruals (new expenditures on long-term NOA), and an estimate of nontransaction accruals obtained from the statement of cash flows and earlier flow-of-funds statements. This decomposition isolates accruals that are linked primarily to accounting policy rather than new investment. The earnings hypothesis suggests that nontransaction accruals should have the strongest predictive power for earnings and stock returns, while the investment hypothesis implies the opposite. Thus, our decomposition allows us to test the competing predictions of the two hypotheses directly.

Our central empirical result is that nontransaction accruals contribute significantly to the accrual anomaly, both to the low persistence of accruals and to the predictive power of accruals for future stock returns. In fact, the predictive slopes on nontransaction accruals are larger in absolute value than the slopes on working-capital accruals and long-term investment. In standard persistence regressions (earnings regressed on prior-year earnings and accruals), the slope on nontransaction accruals (−0.45) is many times larger than the slopes on working-capital accruals (−0.13) and long-term investment (−0.08). Similarly, in predictive regressions for stock returns, the slope on nontransaction accruals is more than 70 % greater than the slopes on working-capital accruals and long-term investment. These results provide strong evidence that investment alone does not explain the accrual anomaly: accruals that are not directly tied to new investment have stronger predictive power for earnings and returns than investment-related accruals.

For additional perspective, we form portfolios based on the component of nontransaction accruals that is uncorrelated with working-capital accruals and long-term investment. This allows us to isolate returns associated with the portion of nontransaction accruals unrelated to investment. From 1972 to 2010, the bottom decile outperforms the top decile by a significant 0.71 % monthly, comparable in magnitude to the return spread when stocks are sorted by working-capital accruals or long-term investment. The nontransaction-accrual strategy also remains profitable at the end of the sample when returns on other accrual strategies decline. In short, accruals that are uncorrelated with current investment have strong predictive power for future stock returns, consistent with the predictions of the earnings hypothesis.

Our results are perhaps most closely related to Dechow and Ge (2006)'s study of special items. However, as we discuss in Sects. 2 and 3, special items and nontransaction accruals differ in keys ways—special items explain only 24 % of the variation in nontransaction accruals—and adding special items to our return regressions has little impact on the results. Nontransaction accruals also remain highly significant even when we control for prior investment. Thus, while nontransaction accruals often relate to past investment expenditures, the predictive power of nontransaction accruals does not simply capture a long-term investment effect carried over from prior years.

Our paper contributes to the literature in several ways. First, we provide a novel decomposition of accruals that allows us to test directly whether investment and non-investment accruals have different predictive power for earnings and stock returns. Prior studies combine investment and non-investment accruals, making it hard to discriminate between the earnings and investment hypotheses. The accrual variables in our decomposition have very different predictive power for firm performance—not just for subsequent earnings but also for subsequent cash flow, accruals, sales growth, and stock returns—confirming that our decomposition captures important differences among different types of accruals. Most important, nontransaction accruals have the strongest predictive power for future earnings and stock returns, contrary to the predictions of the investment hypothesis.

Second, our tests show that earnings positively predict stock returns and, depending on the exact specification, the slope on earnings can be nearly as large in magnitude as the negative slope on ΔNOA. The implication is that a single combined measure—earnings minus accruals, equal to the firm's free cash flow—predicts stock returns nearly as well as the two separate variables do when used together in a regression. Thus, our evidence suggests that a pure cash flow variable explains a significant portion of the accrual anomaly (see also Desai et al. 2004;

Dechow et al. 2008). However, we show that nontransaction accruals have strong predictive power for returns even controlling for a firm's free cash flow, again contrary to the investment hypothesis.

Third, we find that depreciation, along with other items in nontransaction accruals, has significant predictive power for stock returns. This result is surprising because prior studies suggest that depreciation contributes little to the accrual anomaly (e.g., Sloan 1996; Thomas and Zhang 2002). The strong depreciation effect in our tests is explained by the fact that our regressions control for earnings and long-term investment, not just working-capital accruals. The predictive power of depreciation is smaller if earnings and long-term investment are omitted from the regressions because depreciation correlates negatively with earnings and positively with investment.

Finally, we provide comprehensive evidence on the predictive power of accruals among larger firms. While prior studies show that accruals predict stock returns among larger firms (Fama and French 2008; Richardson et al. 2010), studies that examine the connection between accruals and future earnings typically do not consider large firms and small firms separately. In contrast, we repeat all of our tests dropping from the regressions micro-cap stocks, which represent only 3 % of total market value but over 61 % of firms in the sample. We find significant differences between the full-sample and large-firm regressions, but our main conclusions hold in both groups.

The remainder of the paper is organized as follows. Section 2 describes our accrual decomposition and further motivates our tests. Section 3 describes the data. Sections 4 and 5 report predictive regressions for earnings and stock returns. Section 6 concludes.

2 Accruals versus investment

The tight connection between accruals and investment makes it hard to test whether the predictive power of accruals is explained by firms' investment expenditures (the investment hypothesis) or the way expenditures are accounted for in firms' financial statements (the earnings hypothesis). Our empirical strategy is based on the simple observation that the connection between accruals and investment is imperfect. Thus, we attempt to isolate accruals not linked to new investment expenditures and test whether these nontransaction accruals have different implications for subsequent earnings and returns compared with other accruals.

The starting point for our analysis is the broad measure of accruals considered by Fairfield et al. (2003), Richardson et al. (2006a) and Dechow et al. (2008):

$$\text{Total accruals} = \text{change in net operating assets } (\Delta\text{NOA}). \qquad (1)$$

NOA is defined as noncash assets minus nondebt liabilities or, equivalently, as net working capital (WC) plus long-term net operating assets (LTNOA). Thus, total accruals can be expressed as:

$$\Delta\text{NOA} = \Delta\text{WC} + \Delta\text{LTNOA}. \tag{2}$$

Optimally, we would like to break each term in Eq. (2) into a component that reflects new investments made by the firm (net of asset sales) and a component that reflects nontransaction accruals driven by changes in the value of existing assets and liabilities rather than new expenditures. Our main tool for doing so is to use information about nontransaction accruals from the statement of cash flows (SCF) and earlier flow-of-funds statements on Compustat (we refer to these statements collectively as the statement of cash flows, but the variables are available on Compustat prior to the adoption of SFAS 95). In particular, using Compustat's variable names, we define nontransaction accruals (NTAcc) as:

$$\begin{aligned} -\text{NTAcc} = &+ \text{Depreciation and Amortization (SCF account)} \\ &+ \text{Deferred Taxes (SCF account)} \\ &+ \text{Equity in Net Loss (Earnings) of unconsolidated subsidiaries} \\ &+ \text{Loss (Gain) on Sale of Property, Plant and Equipment and Investments} \\ &+ \text{Funds from Operations}-\text{Other (including accruals related to special items)} \\ &+ \text{Extraordinary Items and Discontinued Operations} \\ &\ \text{(cash flow}-\text{income statement account).} \end{aligned} \tag{3}$$

These items include all non-working-capital adjustments made in the SCF to reconcile earnings with cash flow from operations and thus represent all accruals identified as distinct from investments in working capital and long-term assets—precisely what we want to measure. Notice that the terms on the right-hand side represent negative accruals, so their sum defines the negative of NTAcc. Also, the final item in the list is the difference between the value of extraordinary items and discontinued operations (EIDO) reported in the SCF and the value reported in the income statement. We define it this way because Compustat reconciles income before extraordinary items, not net income, with cash flow from operations. As a result, the value of EIDO in the SCF reflects the cash flow implications of EIDO, while the difference between the income statement and SCF values represents accruals associated with EIDO (which is what we want). The components of NTAcc are discussed in more detail in Sect. 3.

A limitation of the data is that we do not know whether the items included in NTAcc affect short-term or long-term assets and liabilities. However, since most items relate to long-term accruals, we assume that NTAcc primarily affects LTNOA. The remaining component of ΔLTNOA then provides a measure of long-term investment expenditures (InvAcc):

$$\text{InvAcc} = \Delta\text{LTNOA} - \text{NTAcc}. \tag{4}$$

The logic is that changes in LTNOA reflect net new investments made by the firm, such as acquisitions or capital expenditures, and changes in the capitalized value of existing assets that are reflected in NTAcc through items such as depreciation, deferred taxes, and asset impairments. Therefore, the portion of ΔLTNOA remaining after taking out nontransaction accruals provides a better measure of new investment than the total change. The separation of ΔLTNOA into investment and nontransaction accruals then implies the following decomposition of total accruals:

$$\Delta\text{NOA} = \Delta\text{WC} + \text{InvAcc} + \text{NTAcc}. \tag{5}$$

This decomposition serves as the basis for our empirical tests. It allows us to explore the differential predictive power of working-capital accruals, long-term investment, and nontransaction accruals for future earnings and stock returns. Our central thesis is that NTAcc should not predict subsequent returns, controlling for the other two components, if investment explains the accrual anomaly.

The decomposition in Eq. (5) provides a novel breakdown of accruals. Prior studies decompose accruals along a number of dimensions—short-term versus long-term, discretionary versus nondiscretionary, reliable versus unreliable—but do not distinguish explicitly between accruals driven by new investment expenditures and nontransaction accruals. The advantage of our approach is that, by isolating accruals that are not tied to new investment, we can directly test whether investment explains the accrual anomaly. Our motivation is similar to that of Richardson et al. (2006a), who test whether accruals that are unrelated to sales growth contribute to the low persistence of accruals. However, their efficiency measure encompasses all accruals that are not proportional to current sales growth, including new investments made by the firm, and therefore may capture the predictive power of both distortions and investment.

Our analysis also shares some similarities with Richardson et al. (2005), who rank accruals according to their perceived reliability. Our motivation differs, but one could argue that nontransaction accruals are subject to the most discretion and include many of the accruals that Richardson et al. highlight as "low reliability," including depreciation, asset write-downs, deferred taxes, and provision for bad debt (Richardson et al. 2005, pp. 448–450). These items rely disproportionately on the subjective judgment of managers and, for the most part, are not tied to verifiable transactions with third parties. This is a strength of our approach because it highlights the stark difference between the earnings and investment hypotheses: the earnings hypothesis, together with the reliability arguments of Richardson et al., suggests that nontransaction accruals should be the most mispriced component of accruals, while the investment hypothesis suggests that nontransaction accruals should have no predictive power after controlling for investment.

Our analysis of nontransaction accruals also overlaps with Dechow and Ge's (2006) study of special items. One important difference is that Dechow and Ge do not test whether special items correlate with investment or predict earnings and returns after controlling for investment. Furthermore, special items and nontransaction accruals differ in key ways. According to Compustat, special items represent "unusual or nonrecurring items" in the income statement. As such, special items exclude many nontransaction accruals (depreciation, deferred taxes, provision for bad debt, deferred revenue, goodwill amortization for unconsolidated subsidiaries, extraordinary items, etc.) and, at the same time, include not just accruals but also cash flows (litigation costs, restructuring charges, severance pay, cash flow from discontinued operations, etc.). As a consequence, we show below that nontransaction accruals and special items have a relatively modest correlation of 0.44 in our sample and controlling for special items has little impact on our results.

Another attractive feature of our approach is that it leads to a novel decomposition of earnings into accruals and cash flows. In particular, earnings minus nontransaction accruals provides a measure of operating cash flow (CF) before working capital and long-term investment:

$$\text{CF} = \text{NI} - \text{NTAcc}, \tag{6}$$

where NI is net income (prior to the adoption of SFAS 95, this measure is precisely what Compustat reports as "Funds from Operations–Total"). The firm's free cash flow can then be defined in two equivalent ways. First, following Dechow et al. (2008), free cash flow can be expressed as the difference between net income and total accruals:

$$\text{FCF} = \text{NI} - \Delta\text{NOA}. \tag{7}$$

Second, subtracting NTAcc from both terms on the right-hand side of this equation, we can re-express FCF as:

$$\text{FCF} = \text{CF} - \Delta\text{WC} - \text{InvAcc}. \tag{8}$$

In other words, free cash flow can be interpreted as either the difference between earnings and accruals or as cash flow left over after investments in working capital and long-term assets. The second interpretation illustrates why ΔWC and InvAcc together provide a better measure of new investment than does ΔNOA: the sum of ΔWC and InvAcc can be expressed as the difference between CF and FCF, which is exactly what we mean by a firm's investment expenditures.

3 Data and descriptive statistics

Accounting data for our tests come from the Compustat annual file, and stock returns come from the Center for Research in Security Prices (CRSP). Since our initial tests focus on accounting performance, we describe the Compustat data here and discuss the return data later.

3.1 Sample

The sample includes all nonfinancial firms on Compustat that have data for net income, total accruals, and average total assets in a given year (financial firms are identified using historical SIC codes from CRSP). Our tests start in 1971, the first year that Compustat has the data items for nontransaction accruals. In addition, because we repeat our tests using only firms larger than the NYSE 20th percentile ranked by market value (price times shares outstanding), we require firms to have beginning-of-year market value on CRSP. Our final sample has an average of 4036 stocks per year from 1971 to 2009, for a total of 157,411 firm-years. The sample of "all-but-tiny firms," larger than the NYSE 20th percentile, has 1542 firms per year, for a total of 60,149 firm-years.

The all-but-tiny sample essentially drops micro-cap stocks from the regressions. For example, at the start of 2009, the NYSE 20th percentile is $308 million, close to the popular cutoff between micro-cap and small-cap stocks (e.g., Investopedia.com, Fama and French 2008). From 1971 to 2009, micro-caps make up slightly more than 61 % of the sample but only 3 % of total market value (in 2009, the largest stock in the sample, Exxon, has a market value twice as large as the combined value of all micro-cap stocks). Thus, the all-but-tiny sample provides a simple check of whether our results are driven by the large number of economically small firms on Compustat or also extend to larger firms.

3.2 Variable definitions

The variable definitions are consistent with our analysis in Sect. 2. We begin with the following variables:

$$\begin{aligned}\text{NOA} &= \text{net operating assets (total assets} - \text{cash} - \text{total liabilities} + \text{debt}),\\ \text{WC} &= \text{net working capital (current assets} - \text{cash} - \text{current liabilities}\\ &\quad + \text{short-term debt}),\\ \text{LTNOA} &= \text{long-term net operating assets (NOA} - \text{WC}).\end{aligned}$$

Accruals equal the annual changes in these variables, supplemented with non-transaction accruals from the SCF (and its antecedents):

$$\begin{aligned}\text{dNOA} &= \text{annual change in NOA},\\ \text{dWC} &= \text{annual change in WC},\\ \text{dLTNOA} &= \text{annual change in LTNOA},\\ \text{NTAcc} &= \text{nontransaction accruals from the SCF (see Section 2)},\\ \text{InvAcc} &= \text{long-term investment accruals (dLTNOA} - \text{NTAcc}),\\ \text{Depr} &= \text{depreciation and amortization accruals (negative of expense)},\\ \text{OthAcc} &= \text{NTAcc} - \text{Depr}.\end{aligned}$$

Notice that the final two items above break nontransaction accruals into depreciation accruals and other accruals, a decomposition that allows us to test whether depreciation differs from other types of nontransaction accruals. Accruals therefore satisfy the following identities:

$$\begin{aligned} \text{dNOA} &= \text{dWC} + \text{dLTNOA}, \\ \text{dNOA} &= \text{dWC} + \text{InvAcc} + \text{NTAcc}, \\ \text{dNOA} &= \text{dWC} + \text{InvAcc} + \text{Depr} + \text{OthAcc}. \end{aligned}$$

Finally, our tests use information about a firm's earnings and cash flows:

$$\begin{aligned} \text{NI} &= \text{net income}, \\ \text{CF} &= \text{operating cash flow before working-capital investments (NI} - \text{NTAcc)}, \\ \text{FCF} &= \text{free cash flow (NI} - \text{dNOA)}. \end{aligned}$$

Following the convention in the literature, the variables are scaled by a firm's average total assets for the year, defined as the average of beginning and ending total assets. We then winsorize the variables annually at their 1st and 99th percentiles to reduce the impact of extreme outliers on the regressions. A consequence of this winsorization is that the various accounting identities do not hold exactly in the data for the small set of firms for which the winsorization affects one variable but not another. We show later, however, that this has minimal impact on our results.

3.3 Descriptive statistics

Table 1 reports summary statistics for the sample. The statistics represent the average from 1971 to 2009 of the annual cross-sectional mean, standard deviation, and 5th and 95th percentiles for each of the winsorized variables. We report the average of annual cross-sectional numbers to be consistent with the Fama–MacBeth regressions discussed below.

In the full sample, average operating cash flow is positive (5.0 %) but average net income and free cash flow are both negative (−2.7 % and −7.1 %, respectively). Working-capital accruals average 1.0 % of assets and changes in LTNOA average 3.4 % of assets, implying that total accruals equal 4.3 % of assets. The change in LTNOA reflects 11.0 % of new investment (InvAcc) and −7.6 % of nontransaction accruals (NTAcc), where the latter item consists of depreciation accruals of −5.1 % and other nontransaction accruals of −2.4 %. Long-term investment is the most volatile component of accruals, with a cross-sectional standard deviation equal to 16.4 %, but variation in working-capital accruals (10.3 %) and nontransaction accruals (9.0 %) is also large relative to typical earnings or cash flow. These volatilities imply that our tests have reasonable power to detect the predictive ability of different accruals.

The right-hand columns in Table 1 show that earnings, accruals, and investment behave much differently among larger firms. Average net income becomes positive (4.5 %) and average operating cash flow grows to 11.2 % of assets. Working-capital accruals (1.5 %) and long-term investment (12.4 %) also increase relative to the full sample, while nontransaction accruals drop slightly (−6.6 % of assets). As a result, dNOA is nearly twice as high among larger firms, 7.2 % of assets compared with 4.3 % of assets in the full sample. The cross-sectional dispersion in all variables is

Table 1 Descriptive statistics, 1971–2009

Variable	Description	All firms				All-but-tiny firms			
		Mean	SD	5th	95th	Mean	SD	5th	95th
NI	Net income	−0.03	0.21	−0.46	0.16	0.05	0.10	−0.13	0.17
CF	Operating cash flow[a]	0.05	0.17	−0.29	0.23	0.11	0.09	−0.02	0.25
FCF	Free cash flow[b]	−0.07	0.24	−0.55	0.19	−0.03	0.16	−0.34	0.17
dNOA	Change in NOA[c]	0.04	0.21	−0.28	0.39	0.07	0.15	−0.13	0.35
dWC	Change in WC[d]	0.01	0.10	−0.16	0.17	0.01	0.06	−0.08	0.13
dLTNOA	Change in LTNOA[e]	0.03	0.16	−0.18	0.31	0.06	0.12	−0.09	0.29
InvAcc	Long-term investment[f]	0.11	0.16	−0.06	0.42	0.12	0.13	−0.01	0.38
NTAcc	Nontransaction accruals[g]	−0.08	0.09	−0.24	0.00	−0.07	0.06	−0.17	−0.01
Depr	Depr. and amort.[h]	−0.05	0.04	−0.12	−0.01	−0.05	0.03	−0.10	−0.02
OthAcc	NTAcc − Depr	−0.02	0.07	−0.15	0.04	−0.02	0.04	−0.09	0.03

This table reports the average cross-sectional mean, standard deviation (SD), and 5th and 95th percentiles for the variables listed, all of which are scaled by average total assets for the year and winsorized annually at their 1st and 99th percentiles. The sample includes all nonfinancial firms on Compustat that have data for average total assets, net income, net operating assets, and beginning-of-year market value (from CRSP), for an average of 4036 firms per year and a total sample of 157,411 firm-years. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value, leaving 1542 firms per year and a total sample of 60,149 firm-years

[a] CF = Cash flow before investments in working capital and long-term assets = NI − NTAcc

[b] FCF = NI − dNOA

[c] NOA = Total assets – cash − nondebt liabilities

[d] WC = Current assets − cash − nondebt current liabilities

[e] LTNOA = NOA − WC

[f] InvAcc = dLTNOA − NTAcc

[g] NTAcc = Non-working-capital operating accruals from the statement of cash flows (SCF)

[h] Depr = Depreciation and amortization accruals (negative of expense) from the SCF

lower than in the full sample, but the variability of accruals is still substantial relative to earnings and cash flow. Long-term investment is again the most volatile component of accruals (13.0 %), while working-capital accruals and nontransaction accruals have standard deviations that are about half as large (6.3 % and 5.7 %, respectively).

Correlations among the variables, in Table 2, are similar in the two samples. Focusing on the full sample, net income is highly correlated with cash flow (0.88) and reasonably strongly correlated with all types of accruals other than long-term investment. The components of accruals tend to be positively correlated with each other, with the exception of long-term investment and nontransaction accruals (−0.33). Thus, firms with more negative NTAcc, often due to greater depreciation expense and asset write-downs, tend to be less profitable yet have higher investment expenditures (more on this below). Free cash flow is positively correlated with net income (0.50) and nontransaction accruals (0.20) but negatively correlated with total accruals (−0.57), working-capital accruals (−0.31), and long-term investment (−0.62).

Table 2 Correlations, 1971–2009

	NI	CF	FCF	dNOA	dWC	dLTNOA	InvAcc	NTAcc	Depr	OthAcc
Panel A: All firms										
NI	–	**0.88**	**0.50**	**0.37**	0.29	0.27	−0.02	**0.46**	0.18	**0.45**
CF	**0.88**	–	**0.48**	0.28	0.26	0.19	0.13	0.05	−0.06	0.10
FCF	**0.50**	**0.48**	–	**−0.57**	**−0.31**	**−0.51**	**−0.62**	0.20	0.09	0.18
dNOA	**0.37**	0.28	**−0.57**	–	**0.61**	**0.83**	**0.64**	0.25	0.09	0.24
dWC	0.29	0.26	**−0.31**	**0.61**	–	0.10	0.02	0.14	0.08	0.12
dLTNOA	0.27	0.19	**−0.51**	**0.83**	0.10	–	**0.82**	0.21	0.05	0.22
InvAcc	−0.02	0.13	**−0.62**	**0.64**	0.02	**0.82**	–	**−0.33**	−0.24	−0.25
NTAcc	**0.46**	0.05	0.20	0.25	0.14	0.21	**−0.33**	–	**0.58**	**0.84**
Depr	0.18	−0.06	0.09	0.09	0.08	0.05	−0.24	**0.58**	–	0.10
OthAcc	**0.45**	0.10	0.18	0.24	0.12	0.22	−0.25	**0.84**	0.10	–
Panel B: All-but-tiny firms										
NI	–	**0.81**	**0.36**	0.26	0.22	0.19	0.02	**0.34**	0.09	**0.36**
CF	**0.81**	–	**0.31**	0.19	0.17	0.14	0.22	−0.23	−0.28	−0.10
FCF	**0.36**	**0.31**	–	**−0.78**	**−0.38**	**−0.70**	**−0.72**	0.11	0.04	0.11
dNOA	0.26	0.19	**−0.78**	–	**0.54**	**0.87**	**0.75**	0.12	0.02	0.14
dWC	0.22	0.17	**−0.38**	**0.54**	–	0.10	0.05	0.11	0.09	0.06
dLTNOA	0.19	0.14	**−0.70**	**0.87**	0.10	–	**0.89**	0.08	−0.03	0.13
InvAcc	0.02	0.22	**−0.72**	**0.75**	0.05	**0.89**	–	**−0.35**	−0.30	−0.23
NTAcc	**0.34**	−0.23	0.11	0.12	0.11	0.08	**−0.35**	–	**0.65**	**0.80**
Depr	0.09	−0.28	0.04	0.02	0.09	−0.03	−0.30	**0.65**	–	0.12
OthAcc	**0.36**	−0.10	0.11	0.14	0.06	0.13	−0.23	**0.80**	0.12	–

This table reports the time-series average of the annual cross-sectional correlations among the variables listed, all of which are scaled by average total assets for the year and winsorized annually at their 1st and 99th percentiles (the variables are defined in Table 1). The sample includes all nonfinancial firms on Compustat with data for average total assets, net income, net operating assets, and beginning-of-year market value (from CRSP), for an average of 4036 firms per year and a total sample of 157,411 firm-years. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value, leaving 1542 firms per year and a total sample of 60,149 firm-years. Bold indicates correlations that are greater than 0.30 in absolute value

3.4 Nontransaction accruals: details

Table 3 provides more information about the items that go into nontransaction accruals. The items consist of all non-working-capital adjustments on Compustat that reconcile earnings with cash flow from operations, including depreciation, deferred taxes, the unremitted portion of earnings of unconsolidated subsidiaries, gains and losses on PP&E sales, accruals related to extraordinary items and discontinued operations, and miscellaneous Funds from Operations–Other. These variables encompass a diverse set of accruals but generally represent accounting charges that reduce earnings. The largest components, based on the means and standard deviations, are Depr and FFOther.

FFOther is a hodgepodge of items, including accruals related to special items, stock-based compensation, provision for bad debt, amortization of goodwill of

Table 3 Nontransaction accruals, 1971–2009

		All firms				All-but-tiny firms			
Variable	Description	Mean	SD	5th	95th	Mean	SD	5th	95th
NTAcc	Nontransaction accruals[a]	−0.08	0.09	−0.24	0.00	−0.07	0.06	−0.17	−0.01
Depr	Dep. and Amort.	−0.05	0.04	−0.12	−0.01	−0.05	0.03	−0.10	−0.02
DefTax	Deferred taxes	0.00	0.01	−0.02	0.02	0.00	0.01	−0.02	0.02
NetLoss	Loss (profit) of uncons. subs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
PPELoss	Loss (gain) on PP&E sale	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
FFOther	Funds from Opers-Other	−0.02	0.06	−0.13	0.01	−0.01	0.04	−0.08	0.01
EIDO	X-items and Disc Opers	0.00	0.02	−0.01	0.00	0.00	0.01	−0.01	0.00

This table reports descriptive statistics (cross-sectional mean, standard deviation, and 5th and 95th percentiles) for the components of nontransaction accruals, including all non-working-capital operating accruals in the statement of cash flows. Variables are scaled by average total assets for the year and winsorized annually at their 1st and 99th percentiles. The sample includes all nonfinancial firms on Compustat that have data for average total assets, net income, net operating assets, and beginning-of-year market value (from CRSP), for an average of 4036 firms per year and a total sample of 157,411 firm-years. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value, leaving 1542 firms per year and a total sample of 60,149 firm-years

[a] NTAcc = Depr + DefTax + NetLoss + PPELoss + FFOther + EIDO

unconsolidated subsidiaries, and other miscellaneous accruals. Unfortunately, Compustat does not provide a detailed breakdown of FFOther. To get some insight, we pulled financial statements from EDGAR for three separate years—1998, 2002, and 2006—for the 20 largest firms in our sample that had big negative FFOther *but no special items*. We selected firms without special items in order to get a sense of what types of non-special-item accruals are included in FFOther, and we selected data from 1998 to 2006, along with one intermediate year, because the former is the first year for which EDGAR has comprehensive data and the latter is the last year prior to the financial crisis. As reported in the Appendix, the most common items in FFOther relate to asset impairments, provision for bad debt, accruals related to minority interest, amortization of various assets and liabilities, and, in 2006, stock-based compensation and tax items. These accruals drive a significant wedge between earnings and cash flow but are not directly linked to new investment. Of course, in a broader sample, accruals related to unusual or nonrecurring special items would likely be important as well.

Figure 1 shows that nontransaction accruals, in general, and FFOther in particular, have become more important in recent decades, mirroring the increase in special items on the income statement. However, as noted earlier, most of the variation in NTAcc, OthAcc, and FFOther is not explained by special items: the cross-sectional R^2s when NTAcc, OthAcc, and FFOther are regressed on special items average just 0.24, 0.28, and 0.35, respectively, during our sample. These correlations reflect, in part, the fact that most firms report NTAcc and FFOther (98 and 75 %, respectively) but less than 40 % have special items (the R^2s jump to 0.36, 0.40, and 0.47, respectively, among firms that report nonzero special items).

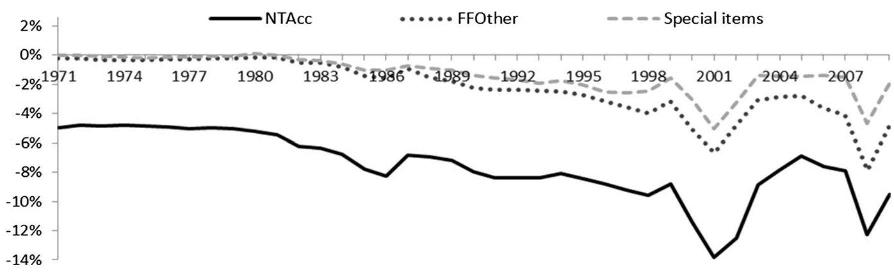

Fig. 1 Nontransaction accruals and special items, 1971–2009. The figure plots the average level of nontransaction accruals (NTAcc), Funds from Operations–Other (FFOther), and special items from 1971–2009. The variables, defined in Table 1, are scaled by average total assets for the year and winsorized annually at their 1st and 99th percentiles. The sample includes all nonfinancial firms on Compustat that have data for average total assets, net income, net operating assets, and beginning-of-year market value (from CRSP)

For additional insight, Table 4 explores the characteristics of firms that report high or low nontransaction accruals (bottom, middle, and top thirds of firms sorted annually by NTAcc). Focusing on the full sample, firms with the most negative NTAcc are substantially less profitable (−12.7 % vs. 2.5 %) and have lower returns in the current and prior years than firms with small or positive NTAcc. Low-NTAcc firms tend to have negative special items (−3.7 %), but special items make up a relatively small fraction of nontransaction accruals (−15.8 %) for those firms. Interestingly, firms that report the most negative NTAcc actually have the highest investment spending and M/B ratios, while all three groups have similar operating cash flow, sales growth, employee growth, and delisting and bankruptcy probabilities. Thus, while nontransaction accruals sometimes reflect asset write-downs and impairments, large negative NTAcc are not, in general, a sign of distress or negative growth. More broadly, NTAcc is often a large component of earnings but is not closely related to other contemporaneous measures of growth and performance.

4 Earnings and cash flow persistence

Our tests start with standard persistence regressions, i.e., we study how the different components of earnings correlate with firms' subsequent performance. An important way we deviate from the literature is that we explore not only the predictability of earnings but also of cash flow. As discussed below, the link between accruals and future cash flow sheds additional light on the lower persistence of accruals and reveals important differences among the different types of accruals.

4.1 Predicting earnings

Table 5 reports cross-sectional regressions of earnings on prior-year earnings and accruals. In particular, we report four sets of Fama and MacBeth (1973) regressions:

Table 4 Firms with low versus high nontransaction accruals, 1971–2009

		Full sample				All-but-tiny firms			
Variable	Description	Low	Med	High	t(H–L)	Low	Med	High	t(H–L)
NI	Net income	−0.13	0.02	0.02	4.42	0.01	0.06	0.06	3.23
CF	Oper. cash flow	0.03	0.08	0.04	0.14	0.13	0.12	0.09	−8.50
FCF	Free cash flow	−0.12	−0.05	−0.04	3.59	−0.05	−0.02	−0.02	2.20
dNOA	Chg. in NOA	0.00	0.07	0.07	4.58	0.06	0.08	0.08	2.86
dWC	Chg. in WC	−0.01	0.02	0.02	7.22	0.01	0.02	0.02	8.95
dLTNOA	Chg. in LTNOA	0.01	0.05	0.05	3.15	0.05	0.06	0.06	0.77
InvAcc	Long-term investment	0.17	0.11	0.06	−9.82	0.18	0.11	0.08	−9.06
NTAcc	Nontransaction accruals	−0.16	−0.06	−0.01	7.62	−0.12	−0.05	−0.02	8.73
Depr	Depr. and amort.	−0.08	−0.05	−0.03	18.68	−0.07	−0.05	−0.03	25.73
OthAcc	NTAcc − Depr	−0.08	−0.01	0.01	5.27	−0.05	−0.01	0.01	5.60
FFOther	Funds from Opers-Other	−0.06	−0.01	0.00	4.47	−0.04	−0.01	0.00	4.12
Special	Special items	−0.04	0.00	0.00	4.10	−0.02	0.00	0.00	3.31
dSales	Sales growth	0.20	0.18	0.18	−1.40	0.19	0.15	0.16	−1.45
dEmploy	Employee growth	0.07	0.08	0.09	2.51	0.09	0.08	0.09	−0.03
Capx	Capital expend.	0.10	0.07	0.05	−7.69	0.11	0.08	0.06	−10.62
Delists	Delisting freq.[a]	0.05	0.01	0.02	−3.83	0.01	0.00	0.00	−2.27
Bankruptcy	Bank prob.[b]	0.02	0.01	0.01	−4.39	0.01	0.00	0.00	−2.72
M/B	Log mkt-to-book	0.60	0.46	0.43	−8.35	0.71	0.61	0.63	−3.61
$Return_0$	Stock return, yr 0	0.09	0.17	0.17	4.20	0.09	0.13	0.13	1.84
$Return_{-1}$	Stock return, yr −1	0.08	0.14	0.15	4.58	0.21	0.20	0.23	1.63
Volatility	Annualized stock volatility	0.59	0.47	0.50	−3.31	0.43	0.36	0.37	-2.81

This table reports characteristics of the bottom, middle, and top one-third of firms sorted annually by nontransaction accruals. The average characteristic for each group is reported, along with the t-statistic, t(H–L), testing whether the average value is different for high- and low-NTAcc firms. Earnings, cash flow, and accruals are scaled by average total assets for the year and winsorized annually at their 1st and 99th percentiles. The sample includes all nonfinancial firms on Compustat that have data for average total assets, net income, net operating assets, and beginning-of-year market value (from CRSP), for an average of 4036 firms per year and a total sample of 157,411 firm-years. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value, leaving 1542 firms per year and a total sample of 60,149 firm-years

[a] Fraction of firms delisting for performance-related reasons (CRSP delist codes 400–599) within 12 months of the fiscal year-end

[b] Annualized bankruptcy probability based on Campbell et al. (2008, Table 3, Model 2)

Table 5 Persistence regressions, 1972–2009

	All firms				All-but-tiny firms			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
NI_{t-1}	0.75	0.75	0.82	0.82	0.75	0.75	0.80	0.81
t	51.43	50.71	29.10	28.94	46.95	45.95	67.34	64.86
$dNOA_{t-1}$	−0.11				−0.09			
t	−11.77				−8.09			
dWC_{t-1}		−0.13	−0.13	−0.13		−0.09	−0.08	−0.09
t		−14.06	−13.28	−13.46		−9.80	−8.84	−9.60
$dLTNOA_{t-1}$		−0.10				−0.08		
t		−8.79				−6.39		
$InvAcc_{t-1}$			−0.08	−0.07			−0.08	−0.07
t			−8.75	−8.32			−6.69	−6.54
$NTAcc_{t-1}$			−0.45				−0.30	
t			−8.92				−6.63	
$Depr_{t-1}$				−0.14				−0.08
t				−5.44				−3.30
$OthAcc_{t-1}$				−0.60				−0.43
t				−14.69				−7.65
R^2	0.474	0.474	0.492	0.496	0.496	0.496	0.513	0.520

This table reports average slopes and R^2s from annual cross-sectional regressions of earnings on prior-year earnings and accruals (intercepts are also included in all regressions). t-statistics, reported below the slope estimates, are based on the time-series variability of the estimates, incorporating a Newey–West correction with three lags to account for possible autocorrelation in the estimates. All variables are scaled by average total assets for the year and winsorized at their 1st and 99th percentiles. The sample includes all nonfinancial firms on Compustat with beginning-of-year market value (from CRSP) and data for all variables within each panel. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value. The variables are defined in Table 1

$$1: NI_t = a_0 + a_1 NI_{t-1} + a_2 dNOA_{t-1} + e_t,$$
$$2: NI_t = b_0 + b_1 NI_{t-1} + b_2 dWC_{t-1} + b_3 dLTNOA_{t-1} + e_t,$$
$$3: NI_t = c_0 + c_1 NI_{t-1} + c_2 dWC_{t-1} + c_3 InvAcc_{t-1} + c_4 NTAcc_{t-1} + e_t,$$
$$4: NI_t = d_0 + d_1 NI_{t-1} + d_2 dWC_{t-1} + d_3 InvAcc_{t-1} + d_4 Depr_{t-1} + d_5 OthAcc_{t-1} + e_t.$$

The goal, following Sloan (1996) and others, is to explore the differential persistence of accruals and cash flow, or, equivalently, to test whether accruals predict future earnings after controlling for current earnings. As noted by Fairfield et al. (2003) and Richardson et al. (2005), equivalent regressions could be estimated with cash flow replacing earnings as an independent variable. For example, Model 1 could be estimated as:

$$1^*: NI_t = e_0 + e_1 FCF_{t-1} + e_2 dNOA_{t-1} + e_t,$$

with slopes that are mechanically linked to those in Model 1: $e_1 = a_1$ and $e_2 = a_1 + a_2$. The slopes in Model 1* can be interpreted as the persistence of cash flow and accruals, while the slopes in Model 1 capture the persistence of cash flow ($a_1 = e_1$) and the *differential* persistence of accruals and cash flow ($a_2 = e_2 - e_1$).[1] The contribution of Models 2, 3, and 4 is to test whether different types of accruals have different implications for future performance (or, equivalently, exhibit differential persistence).

Models 1 and 2 in Table 5 replicate the findings of prior studies: earnings are persistent but, controlling for NI_{t-1}, higher accruals forecast lower subsequent profits. The slope on lagged earnings is 0.75 in both samples of firms and both models, while the slope on total accruals ($dNOA_{t-1}$) is −0.11 in the full sample and −0.09 in the all-but-tiny subsample (more than eight standard errors below zero). The implication is that accruals are significantly less persistent than cash flows. Furthermore, Model 2 shows that working-capital and long-term accruals are both strongly negatively related to future earnings, with slopes that are similar to each other and to the slope on $dNOA_{t-1}$ in Model 1. Our estimates are close to the slopes on dNOA reported by Richardson et al. (2006a) and Dechow et al. (2008).

Models 3 and 4, with dLTNOA broken into investment and nontransaction accruals, are new to this paper. The results reveal several key findings. First, working-capital accruals (dWC), long-term investment (InvAcc), and nontransaction accruals (NTAcc) all contribute to the predictive power of total accruals, with slopes that are more than six standard errors below zero. The slopes on dWC and InvAcc are similar to the slope on dNOA in Model 1, while the slope on NTAcc is many times larger, −0.45 in the full sample and −0.30 for all-but-tiny firms. Thus, NTAcc is by far the least persistent component of earnings, consistent with the argument that nontransaction accruals include many transitory and low-reliability accruals (the differences are statistically significant, with t-statistics testing equality that range from −4.50 to −7.53). The results suggest that our decomposition provides a powerful setting to test the earnings and investment hypotheses: NTAcc has strong predictive ability for future earnings but, as discussed in Sects. 2 and 3, represents a component of accruals not driven by new investment expenditures. The earnings hypothesis, but not the investment hypothesis, implies that NTAcc should also predict returns.

Model 4 shows that nontransaction accruals other than depreciation explain the large negative slope on NTAcc. Depreciation is highly significantly negative, with a predictive slope as large as the slopes on dWC and InvAcc, but other nontransaction accruals (OthAcc) have a slope that is roughly five times bigger, −0.60 in the full sample and −0.43 among larger firms. The implied persistence of OthAcc, adding the slopes on NI_{t-1} and $OthAcc_{t-1}$, equals just 0.22 in the full sample and 0.38 for larger firms, substantially lower than the implied persistence of 0.68–0.75 for the other components of accruals and 0.81–0.82 for cash flow. Thus, asset write-downs,

[1] Note that, while the term “persistence” is common in the accrual literature, it is a bit of a misnomer, referring to the slope in the earnings predictability regression rather than the autocorrelation of the variable itself. The two quantities can be very different, as we show below. For clarity, we always use the term “autocorrelation” when referring to the univariate time-series properties of the variables.

deferred taxes, and the other items in OthAcc have a largely transitory effect on earnings.[2]

A third important result is that, when we control for nontransaction accruals, the predictive power of long-term investment is weaker than the predictive power of working-capital accruals: in Model 3, $InvAcc_{t-1}$ has a slope of −0.08 (t-statistic of −8.75) for the full sample compared with a slope of −0.13 (t-statistic of −13.28) on dWC_{t-1}. This evidence suggests that, contrary to the hypothesis of Fairfield et al. (2003), working-capital accruals and long-term investment have different predictive power for subsequent profitability.

Finally, it is interesting to note that our estimates for the full and all-but-tiny samples are fairly similar, despite significant differences in the samples' univariate properties (Table 1). The slopes on NI_{t-1} are nearly identical in the two samples, while the slope on accruals tends to be modestly more negative in the full sample. Perhaps the most important difference between the groups is that working-capital accruals have stronger predictive power in the full sample, with a slope of −0.13 compared with a slope of −0.08 for larger firms (Model 3). Overall, however, our results suggest that the persistence of accruals and cash flow is fairly similar for small and large firms.

4.2 Predicting cash flow

Table 6 provides additional insight into the predictive power of accruals. In particular, we replicate the persistence regressions above but substitute operating cash flow (CF) and free cash flow (FCF) as dependent variables in place of earnings. The underlying question is whether the different types of accruals predict performance measured by cash flow in the same way they predict performance measured by earnings. The tests help illuminate differences among the components of accruals.

Several results stand out. First, controlling for current earnings, dNOA is strongly negatively related to firms' subsequent cash flow but different types of accruals have very different predictive power. For example, in the full-sample regressions in Panel A, with CF as the dependent variable, the slope on $InvAcc_{t-1}$ is close to zero while the slopes on dWC_{t-1} and $NTAcc_{t-1}$ are large and highly significant (−0.12 and −0.82, respectively, with t-statistics of −15.82 and −52.20 in Model 3). The results again show that our decomposition captures significant differences among different types of accruals, not just in their predictive power for earnings for also in their predictive power for cash flows. Indeed, the predictive R^2 in Panel A jumps substantially when dLTNOA is broken into investment and nontransaction accruals (Model 2 vs. Model 3), from 0.47 to 0.58 in the full sample and from 0.44 to 0.62 for larger stocks.

[2] The persistence slopes mentioned here differ markedly from the univariate autocorrelations of the variables. In fact, NTAcc is actually more highly autocorrelated (0.49) than either working-capital accruals (0.02) or long-term investment (0.28). Even OthAcc has a positive autocorrelation of 0.27. Thus, the persistence slopes in the earnings regressions do not simply reflect the univariate time-series properties of different accruals but instead tell us whether their effects on earnings tend to reverse.

Table 6 Predicting cash flow, 1972–2009

	All firms				All-but-tiny firms			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Panel A: Dependent variable is CF								
NI_{t-1}	0.63	0.63	0.77	0.76	0.67	0.67	0.79	0.77
t	40.04	39.89	47.84	45.73	21.00	20.63	64.18	58.44
$dNOA_{t-1}$	−0.08				−0.05			
t	−9.63				−7.83			
dWC_{t-1}		−0.13	−0.12	−0.12		−0.12	−0.09	−0.09
t		−16.59	−15.82	−15.73		−10.47	−12.97	−11.81
$dLTNOA_{t-1}$		−0.05				−0.03		
t		−3.96				−2.96		
$InvAcc_{t-1}$			−0.01	−0.01			−0.03	−0.03
t			−1.65	−1.66			−9.07	−9.08
$NTAcc_{t-1}$			−0.82				−0.82	
t			−52.20				−39.19	
$Depr_{t-1}$				−1.01				−1.03
t				−51.50				−55.78
$OthAcc_{t-1}$				−0.76				−0.70
t				−40.25				−35.53
R^2	0.471	0.474	0.580	0.581	0.439	0.444	0.621	0.625
Panel B: Dependent variable is FCF								
NI_{t-1}	0.48	0.48	0.54	0.54	0.41	0.40	0.43	0.43
t	6.43	6.38	5.96	5.90	7.57	7.43	6.76	6.81
$dNOA_{t-1}$	−0.23				−0.26			
t	−16.67				−9.92			
dWC_{t-1}		−0.16	−0.16	−0.16		−0.15	−0.15	−0.15
t		−5.46	−5.46	−5.40		−5.09	−5.42	−5.47
$dLTNOA_{t-1}$		−0.29				−0.32		
t		−14.17				−8.93		
$InvAcc_{t-1}$			−0.26	−0.26			−0.31	−0.31
t			−10.20	−10.11			−8.67	−8.72
$NTAcc_{t-1}$			−0.56				−0.46	
t			−11.00				−12.88	
$Depr_{t-1}$				−0.53				−0.43
t				−10.01				−6.35
$OthAcc_{t-1}$				−0.59				−0.51
t				−9.55				−13.13
R^2	0.228	0.235	0.249	0.249	0.130	0.139	0.146	0.148

This table reports average slopes and R^2s from annual cross-sectional regressions of cash flow before investment (Panel A) and cash flow after investment (Panel B) on prior-year earnings and accruals (intercepts are included in all regressions). t-statistics, reported below the slope estimates, are based on the time-series variability of the estimates, incorporating a Newey–West correction with three lags to account for possible autocorrelation in the estimates. All variables are scaled by average total assets during the year and winsorized at their 1st and 99th percentiles. The sample includes all nonfinancial firms on Compustat with beginning-of-year market value (from CRSP) and data for all variables within each panel. The all but tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value. The variables are defined in Table 1

The slope on dWC in Panel A is nearly identical to the slope in the earnings regressions in Table 5, implying that dWC predicts earnings because it predicts a drop in cash flow rather than a decline in working capital or nontransaction accruals (see also Allen et al. 2013).

In contrast, the slope on nontransaction accruals is much larger here than in Table 5 (−0.82 vs. −0.45, focusing on Panel A). This result implies that, controlling for current *earnings*, large negative NTAcc predict higher future cash flow. Alternatively, if we control for current *cash flow* in the regression, replacing NI_{t-1} with CF_{t-1}, the slope on $NTAcc_{t-1}$ equals the sum of the estimated slopes on NI_{t-1} and $NTAcc_{t-1}$ (see our discussion at the start of Sect. 4.1), giving a persistence slope of −0.05 in Panel A (0.77–0.82). Thus, conditional on a firm's current *cash flow*, NTAcc contain essentially no information about the firm's future cash flow. This result again shows that NTAcc are not just driven by write-downs or other charges that anticipate low future cash flow and provides additional evidence that nontransaction accruals have the least reliable information about a firm's subsequent performance.

Finally, it is interesting to note that, controlling for current earnings, long-term investment (InvAcc) is much more negatively related to future earnings in Table 5 than to future CF in Table 6. Thus, profitability drops following high InvAcc but operating cash flow does not (the difference reflects the fact that InvAcc is negatively associated with subsequent nontransaction accruals). This result is opposite the pattern for dWC, providing additional evidence that working-capital accruals and long-term investment have different implications for future performance.

In summary, Tables 5 and 6 show that our decomposition captures meaningful differences among different types of accruals. Working-capital accruals, long-term investment, and nontransaction accruals all contribute to the low persistence of dNOA but have economically and statistically different predictive power. NTAcc appears to be the least reliable component, with low persistence slopes in the earnings regressions and little information about future cash flows.

5 Predicting stock returns

As noted above, our accrual decomposition permits a powerful test of the earnings and investment hypotheses: nontransaction accruals are strongly negatively related to future earnings (controlling for current earnings and the other components of accruals) but represent a component of accruals that is not linked to new investment expenditures. The earnings hypothesis suggests that NTAcc will predict returns, while the investment hypothesis implies the opposite.

5.1 Return data

Our return tests use nearly the same sample of firms as our persistence regressions, with a few minor tweaks. In the persistence regressions, a firm must have Compustat data in both the current and prior fiscal years (t and t − 1). In contrast, the return regressions require firms to have CRSP data for year t and Compustat data for fiscal year t − 1. Thus a firm can be included in the return regressions even if it does not have Compustat data for fiscal year t. The motivation for this approach is to avoid introducing any survival bias into the sample: we want to include any firm that could enter an investor's portfolio at the start of the year, not just firms that survive until the end of the year on Compustat.

We assume that accounting data are publicly available 4 months after the fiscal year. Return year t is therefore defined as the 12 months starting in the fifth month after fiscal year t − 1. We regress monthly stock returns during this period on accruals for fiscal year t − 1. We focus on monthly returns to avoid making any assumptions about what to do with firms that drop off CRSP during the year. Our tests simply include a firm up until the month it drops off CRSP, including any delisting return.

The return regressions include an average of 4082 stocks per month from May 1972 through December 2010 (464 months), compared with an average of 4036 firms in the persistence regressions. The subsample of all-but-tiny stocks has 1595 stocks per month, compared with an average of 1542 firms in the persistence regressions. The average monthly stock return is 1.24 % in the full sample and 1.09 % for all-but-tiny stocks, with cross-sectional standard deviations of 16.9 % and 11.1 %, respectively.

5.2 Return regressions

Table 7 reports Fama–MacBeth regressions of monthly stock returns on lagged earnings and accruals. The regressions include a firm's market value (LogSize_{t-1}), book-to-market ratio (LogB/M_{t-1}), and past 12-month stock return (Ret_{Yr-1}) as control variables since they are well-known predictors of returns (momentum is weak at the annual horizon, but we include Ret_{Yr-1} for completeness).[3]

Columns (1) and (2) confirm that total accruals (dNOA), working-capital accruals (dWC), and long-term accruals (dLTNOA) all have strong predictive power for subsequent returns, consistent with prior studies. The slope on dNOA in column (1) is more than eight standard errors below zero in both samples, while the slopes on dWC and dLTNOA in column (2) are more than six standard errors below zero. The point estimates on the three variables range from −2.10 to −2.22 in the full sample and from −1.71 to −2.61 in the all-but-tiny sample, similar to the slopes on dWC and dLTNOA reported by Richardson et al. (2005) (dividing their annual coefficients by 12). The primary new result in columns (1) and (2) is that the slopes on dWC and dLTNOA are strong not only in the full sample but also among larger stocks. One interesting difference between the samples is that the slope on dWC is about 50 % greater than the slope on dLTNOA (−2.61 vs. −1.71) in the all-but-tiny sample, a difference that is statistically significant (the t-statistic testing

[3] LogSize_{t-1} is the natural log of the firm's market value at the start of return year t; LogB/M_{t-1} is the natural log of the book value of common equity for fiscal year t−1 minus LogSize_{t-1}; and Ret_{Yr-1} is the return in the 12 months leading up to the start of return year t (skipping the final month). The control variables reduce the sample to an average of 3969 stocks per month and the all-but-tiny subsample to 1495 stocks per month.

Table 7 Predicting monthly stock returns, May 1972–December 2010

	All firms					All-but-tiny firms				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
NI_{t-1}	1.07	1.05	1.29	1.21	1.25	2.11	2.17	2.71	2.62	2.57
t	2.56	2.52	2.98	2.79	2.85	3.75	3.90	4.82	4.63	4.41
$dNOA_{t-1}$	−2.16					−2.01				
t	−13.10					−8.64				
dWC_{t-1}		−2.10	−2.12	−2.09	−2.09		−2.61	−2.54	−2.50	−2.52
t		−8.11	−8.07	−7.95	−7.94		−6.29	−6.14	−6.02	−6.10
$dLTNOA_{t-1}$		−2.22					−1.71			
t		−11.16					−6.74			
$InvAcc_{t-1}$			−2.16	−2.19	−2.18			−1.71	−1.72	−1.72
t			−10.83	−11.03	−11.17			−6.78	−6.75	−6.78
$NTAcc_{t-1}$			−4.15					−4.43		
t			−8.19					−6.31		
$Depr_{t-1}$				−5.86	−5.73				−5.50	−5.17
t				−6.68	−6.63				−4.81	−4.81
$OthAcc_{t-1}$				−3.90	−3.70				−4.28	−3.73
t				−6.75	−5.92				−5.28	−4.20
$Special_{t-1}$					−2.02					−25.35
t					−0.77					−1.27
$LogSize_{t-1}$	−0.11	−0.11	−0.11	−0.11	−0.11	−0.07	−0.07	−0.07	−0.07	−0.07
t	−2.68	−2.66	−2.72	−2.67	−2.68	−1.61	−1.68	−1.60	−1.57	−1.58
$LogB/M_{t-1}$	0.26	0.26	0.27	0.27	0.27	0.21	0.21	0.24	0.24	0.24
t	4.22	4.20	4.38	4.45	4.53	2.56	2.58	3.04	2.97	3.00
Ret_{Yr-1}	0.05	0.05	0.04	0.04	0.04	0.29	0.28	0.28	0.28	0.30
t	0.44	0.39	0.32	0.31	0.37	2.16	2.10	2.10	2.08	2.26
R^2	0.028	0.029	0.030	0.031	0.031	0.046	0.048	0.052	0.054	0.055

This table reports average slopes and R^2s from cross-sectional regressions of monthly stock returns (in %) on lagged earnings, accruals, and other firm characteristics (the regression intercepts are omitted from the table). t-statistics, reported below the slope estimates, are based on the time-series variability of the estimates. All predictor variables are winsorized annually at their 1st and 99th percentiles and updated once per year, 4 months after the end of the firm's prior fiscal year. Prior-year earnings and accruals (NI, dNOA, dWC, InvAcc, NTAcc, Depr, OthAcc) are scaled by average total assets for that year and are defined in Table 1. LogSize is the natural log of market value; LogB/M is natural log of book equity minus LogSize; and Ret_{Yr-1} is the prior-year stock return, skipping the final month. Accounting data come from Compustat, and market data come from CRSP. The sample includes all nonfinancial firms on CRSP and Compustat with nonmissing data for current returns and lagged LogSize, NI, and dNOA. The all-but-tiny sample drops firms below the NYSE 20th percentile based on LogSize

equality is −2.01). Thus, among larger stocks, working-capital accruals have stronger predictive power than long-term accruals.

Column (3) shows that investment and nontransaction accruals both contribute to the predictive power of dLTNOA, with slopes that are more than six standard errors from zero. Mirroring our findings in Sect. 4, the slope on NTAcc is roughly twice as big as the slopes on dWC and InvAcc (the differences are statistically significant, with t-statistics testing equality ranging from −2.36 to −3.97). These results again demonstrate significant differences among different types of accruals. More importantly, the evidence contradicts the hypothesis that investment explains the accrual anomaly: nontransaction accruals are not tied to current investment expenditures yet have strong predictive power for both earnings and stock returns—indeed, the slope on NTAcc is stronger than the slope on investment-related accruals. The results are consistent with Sloan's (1996) earnings hypothesis and, in particular, the idea that investors do not fully recognize the low persistence of NTAcc.

A concern voiced by several readers is that the regressions in Table 7 do not control for investment in prior years, which might relate to current NTAcc and predict returns several years in the future. Recall, however, that NTAcc is *negatively* correlated with investment—high investment tends to be associated with more negative depreciation accruals, write-downs, and the other components of NTAcc—so controlling for lagged investment would *increase*, not explain, the predictive power of NTAcc. Indeed, the slope on NTAcc becomes slightly bigger, −4.19 with a t-statistic of −8.10 in the full sample, if we add $InvAcc_{t-2}$ to the regression in column (3) (in a similar spirit, Richardson et al. (2006b) show that prior-year accruals add little to predictive regressions that include current-year accruals).

In column (4), depreciation and other nontransaction accruals both have strong predictive power for returns. Depreciation accruals have the most negative slopes in both samples, with point estimates of −5.86 and −5.50 and t-statistics of −6.68 and −4.81. These results are surprising since prior studies suggest that depreciation contributes little to the accrual anomaly (Sloan 1996; Thomas and Zhang 2002). The strong depreciation effect in our tests can be explained by the fact that our regressions include not just working-capital accruals but also earnings and long-term investment. Depreciation accruals are positively correlated with NI and negatively correlated with InvAcc (see Table 2), so controlling for those variables significantly strengthens the slope on Depr [the slope drops by more than 50 % if we omit NI and InvAcc from the full-sample regression in column (4)]. In essence, the predictive power of depreciation is typically masked in the literature because of its correlation with profits and investment.

The strong negative slope on depreciation is interesting because Depr has a *smaller* slope than OthAcc in the earnings persistence regressions in Table 5. This results suggests that investors are more surprised by the low persistence of Depr than the substantially lower persistence of OthAcc. One potential explanation is that, because depreciation itself is quite stable (with a first-order autocorrelation of 0.87), investors might not realize that depreciation has relatively low persistence when forecasting earnings, with a persistence slope of 0.68–0.73 in Table 5 (adding the slopes on NI_{t-1} and $Depr_{t-1}$). Investors might overlook depreciation, in part, if they focus on measures of earnings before depreciation (e.g., EBITDA). An alternative possibility is that stock prices react not only to earnings but also to cash flow, and investors may be surprised by the strong negative relation between Depr and subsequent cash flow found in Table 6.

The significance of Depr illustrates another important fact: the predictive power of nontransaction accruals is not just driven by write-downs and other special items.

More explicitly, column (5) shows that controlling for special items has little impact on our results: special items are insignificant, and the other slopes remain similar to the estimates in column (4). For example, in the full sample, the slope on OthAcc—the component of accruals that is most highly correlated with special items—drops only slightly from −3.90 in column (4) to −3.70 in column (5) and remains highly significant. Thus, the predictive power of NTAcc does not simply reflect the impact of special items documented by Dechow and Ge (2006).[4]

A final important result in Table 7 is that, controlling for accruals, earnings have significant predictive power for returns. Across the different specifications, the slope on NI_{t-1} varies from 1.05 to 1.29 in the full sample (t-statistics of 2.52–2.98) and from 2.11 to 2.71 among larger stocks (t-statistics of 3.75–4.82). The positive slope is consistent with post-earnings-announcement drift in returns [as well as the evidence in Fama and French (2006, 2008) and Novy-Marx (2013)], though the accrual literature has often missed this effect. In fact, the lack of a reliably positive slope on earnings has been one of the problems for Sloan's (1996) earnings-fixation hypothesis: if investors fixate on earnings, they should be just as surprised by the higher persistence of cash flows as they are by the lower persistence of accruals. Thus, our positive slope on NI_{t-1} provides new support for the earnings-fixation hypothesis.

In terms of magnitudes, the slope on earnings is about half the slope on accruals in the full sample and similar to the slope on accruals among larger stocks. If the magnitudes were identical, a single combined measure, earnings minus accruals, would encompass the predictive power of both variables (i.e., variables with identical slopes can be combined with no loss of explanatory power). As noted in Sect. 2, the combined variable equals a firm's free cash flow, FCF = NI − dNOA. The evidence in Table 7 therefore suggests that a pure cash flow variable might capture a significant portion of the accrual anomaly.

Table 8 tests that hypothesis directly. The table is identical to Table 7 except that FCF_{t-1} is used in place of NI_{t-1} in the regressions. Note that, if the relation FCF = NI − dNOA held exactly in the data, the change in variables would have no impact on the regressions except that the slope on dNOA would now equal the difference between the slopes on NI and dNOA estimated in Table 7 (the slope on FCF would be the same as the slope on NI). In practice, the relation does not hold exactly because we winsorize the variables, but the impact of this slippage is relatively small.[5]

[4] One complication is that special items are zero for most firms at the start of the sample. This does not create a problem for the other variables, but it does make the slope on special items highly volatile prior to 1975. For robustness, we note that the results are similar if we drop the early years from the tests (special items remain insignificant, while other variables continue to have strong predictive power.) We have also repeated the tests using a dummy variable that equals one if special items are less than −2 % of assets and zero otherwise, following the approach of Dechow and Ge (2006). Again, the dummy variable itself is not significant, and the slopes on the other variables are very close to those reported in Table 7. In addition, we explored the predictive power of asset impairments using the supplemental data items GDWLIP and WDP on Compustat, available after 2001. Those items are insignificant and have little effect on the other slopes, though power is limited given the relatively short sample.

[5] We view the benefits of winsorization as outweighing the benefits of having the accounting identities hold perfectly in the data. An alternative approach would be to winsorize only net income and the components of accruals and to construct dNOA and FCF from the winsorized variables. However, it is not clear which variables to winsorize first and which to construct after, so we prefer the simpler approach of just winsorizing all of the predictors separately. The key goal, in our view, is to ensure that all of the

Table 8 Predicting monthly stock returns: Accruals versus FCFs, May 1972–December 2010

	All firms					All-but-tiny firms				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
FCF_{t-1}	1.04	1.04	1.32	1.24	1.28	2.15	2.13	2.52	2.44	2.40
t	2.67	2.75	3.34	3.12	3.21	4.01	4.11	4.81	4.63	4.48
$dNOA_{t-1}$	−1.14					0.12				
t	−3.00					0.23				
dWC_{t-1}		−1.10	−0.80	−0.85	−0.82		−0.41	0.05	0.02	−0.04
t		−2.49	−1.77	−1.87	−1.81		−0.64	0.08	0.03	−0.06
$dLTNOA_{t-1}$		−1.18					0.44			
t		−3.01					0.85			
$InvAcc_{t-1}$			−0.82	−0.93	−0.89			0.83	0.73	0.71
t			−1.97	−2.22	−2.15			1.56	1.38	1.31
$NTAcc_{t-1}$			−2.73					−1.71		
t			−4.93					−2.13		
$Depr_{t-1}$				−4.55	−4.38				−2.90	−2.60
t				−4.60	−4.52				−2.27	−2.12
$OthAcc_{t-1}$				−2.49	−2.26				−1.54	−1.07
t				−4.17	−3.63				−1.77	−1.13
$Special_{t-1}$					−2.01					−25.98
t					−0.76					−1.31
$LogSize_{t-1}$	−0.11	−0.11	−0.11	−0.11	−0.11	−0.07	−0.07	−0.07	−0.07	−0.07
t	−2.63	−2.60	−2.71	−2.65	−2.66	−1.51	−1.54	−1.58	−1.53	−1.55
$LogB/M_{t-1}$	0.25	0.25	0.27	0.27	0.27	0.21	0.21	0.23	0.23	0.23
t	4.13	4.14	4.35	4.41	4.48	2.63	2.63	2.95	2.91	2.96
Ret_{Yr-1}	0.04	0.03	0.04	0.03	0.04	0.28	0.27	0.28	0.28	0.30
t	0.32	0.28	0.30	0.29	0.35	2.07	2.03	2.08	2.07	2.25
R^2	0.028	0.029	0.030	0.031	0.031	0.046	0.049	0.052	0.054	0.055

This table reports average slopes and R^2s from cross-sectional regressions of monthly stock returns (in %) on lagged cash flow, accruals, and other firm characteristics. (The regression intercepts are omitted from the table.) t-statistics, reported below the slope estimates, are based on the time-series variability of the estimates. All predictor variables are winsorized annually at their 1st and 99th percentiles and updated once per year, 4 months after the end of the firm's prior fiscal year. Prior-year cash flow and accruals (FCF, dNOA, dWC, InvAcc, NTAcc, Depr, OthAcc) are scaled by average total assets for that year and are defined in Table 1. LogSize is the natural log of market value; LogB/M is natural log of book equity minus LogSize; and Ret_{Yr-1} is the prior-year stock return, skipping the final month. Accounting data come from Compustat, and market data come from CRSP. The sample includes all nonfinancial firms on CRSP and Compustat with nonmissing data for current returns and lagged LogSize, NI, and dNOA. The all-but-tiny sample drops firms below the NYSE 20th percentile based on LogSize

Table 8 shows that the slopes on accruals shrink significantly when we control for FCF, but accruals—especially nontransaction accruals—have some incremental predictive power. In the full sample, the slope on dNOA declines by

Footnote 5 continued
variables capture what they intend to capture and that the results are not driven by a few extreme data points. Our approach satisfies those requirements.

about a half relative to the estimate in Table 7 but remains three standard errors below zero. The slopes on dWC and InvAcc are marginally significant, with t-statistics of −1.77 and −1.97, while the slope on NTAcc and its components (Depr and OthAcc) remains highly significant (t-statistics of −4.17 to −4.93 in columns 3 and 4). In the all-but-tiny sample, FCF fully absorbs the predictive power of dNOA, dWC, and InvAcc—many of the estimates actually become positive—but nontransaction accruals continue to be significant, with t-statistics ranging from −1.77 to −2.27 in columns (3) and (4). Thus, FCF absorbs a significant portion of the accrual anomaly but cannot explain the predictive power of nontransaction accruals, again contrary to the predictions of the investment hypothesis.

5.3 Portfolios

To provide additional perspective on the predictive power of accruals, Table 9 reports average monthly returns for accrual-sorted portfolios. We form four sets of portfolios, based on (1) total accruals, (2) working-capital accruals, (3) long-term investment, and (4) nontransaction accruals. The first three sets are constructed simply by sorting stocks based on dNOA, dWC, and InvAcc. For the final set, rather

Table 9 Average returns on accrual-sorted portfolios, 1972–2010

Portfolio	All firms				All-but-tiny firms			
	dNOA	dWC	InvAcc	NTAcc*	dNOA	dWC	InvAcc	NTAcc*
Low accruals	1.76	1.44	1.60	1.42	1.45	1.25	1.30	1.24
2	1.67	1.48	1.55	1.43	1.39	1.26	1.23	1.23
3	1.58	1.36	1.52	1.48	1.32	1.22	1.31	1.29
4	1.42	1.36	1.44	1.37	1.31	1.19	1.25	1.23
5	1.45	1.34	1.36	1.41	1.28	1.14	1.19	1.19
6	1.34	1.33	1.28	1.22	1.24	1.17	1.21	1.12
7	1.33	1.36	1.32	1.17	1.19	1.20	1.21	1.02
8	1.15	1.26	1.22	1.21	1.07	1.15	1.12	1.08
9	0.95	1.12	1.01	1.10	0.85	1.02	0.94	0.91
High accruals	0.41	0.82	0.50	0.71	0.43	0.62	0.58	0.70
Low–high	1.35	0.61	1.10	0.71	1.03	0.64	0.73	0.54
t-stat	10.48	6.99	8.77	6.19	7.87	6.04	5.07	5.07

This table reports average monthly returns (in %) for four sets of accrual-sorted portfolios, formed based on (1) total accruals (dNOA), (2) working-capital accruals (dWC), (3) long-term investment (InvAcc), and (4) the component of nontransaction accruals that is uncorrelated with dWC and InvAcc (this component is labeled NTAcc*). Low–High is the average return on decile 1 minus decile 10. Portfolios are equal-weighted and formed monthly using NYSE breakpoints. The accrual variables, defined in Table 1, are updated once per year, four months after the firm's fiscal year-end. Accounting data come from Compustat, and market data come from CRSP. The sample includes all nonfinancial firms on CRSP and Compustat with nonmissing data for current returns, dNOA, and net income. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value than sort directly on NTAcc, we sort on the component of NTAcc that is uncorrelated with the dWC and InvAcc, i.e., we regress NTAcc each month on dWC and InvAcc and sort stocks based on residuals from the regression (labeled NTAcc*). The goal is to isolate the component of accruals that is uncorrelated with investment to provide a clean test of whether non-investment-related accruals have predictive power.

Like our cross-sectional regressions, Table 9 shows that dNOA and all three components strongly relate to subsequent stock returns. Total accruals have the strongest predictive power, with a return spread between decile 1 and decile 10 of 1.35 % in the full sample and 1.03 % among all-but-tiny stocks (with t-statistics of 10.48 and 7.87, respectively). The return spreads are lower but still economically and statistically strong when we sort based on dWC, InvAcc, and NTAcc*. Most important, Table 9 shows that sorting stocks based on accruals constructed to be uncorrelated with investment creates a large spread in portfolio returns, with a long-short return of 0.71 % monthly in the full sample and 0.54 % in the all-but-tiny stock sample (with t-statistics of 6.19 and 5.07). Again, these results provide strong evidence a significant portion of the accrual anomaly cannot be explained by investment.[6]

Figure 2 explores how returns on the long-short portfolios change through time. Specifically, the figure plots average monthly returns over 10-year rolling windows (the x-axis identifies the final month of the window) for the four long-short portfolios described in Table 9, based on dNOA (dark solid line), dWC (dotted line), InvAcc (dashed line), and NTAcc* (light solid line).

Similar to the findings of Richardson et al. (2010) and Green et al. (2011), our results suggest that strategies based on dNOA and dWC have become less profitable in recent years, dropping markedly in the last 10 years of the sample. For example, focusing on results for all stocks (Panel A), the average monthly return on the dNOA strategy drops from 2.39 % in the 10 years ending December 2000 (close to its all-time peak) to 0.94 % in the 10 years ending December 2010. The average return on the dWC strategy drops from 1.13 % to 0.13 % during the same period. In contrast, the 10-year average return on the nontransaction accrual portfolio is relatively stable at the end of the sample—indeed, the return from January 2001–December 2010 is slightly higher than the average return over the whole period: the 10-year rolling average equals 0.80 % for the first 10 years of the sample, peaks at 1.28 % in the 10 years ending January 2004, and equals 0.76 % over the final 10 years. These results suggest that our NTAcc strategy has been affected less by whatever forces have reduced the profitability of other accrual strategies.

[6] As a robustness check, we have repeated the analysis dropping firms with large special items, defined as special items less than −2 % of assets, following Dechow and Ge (2006). The relation between returns and NTAcc* remains strong even in this sample, with a long-short return spread of 0.57 % monthly (t-statistic of 5.32) in the full sample and 0.43 % monthly (t-statistic of 3.83) among larger firms.

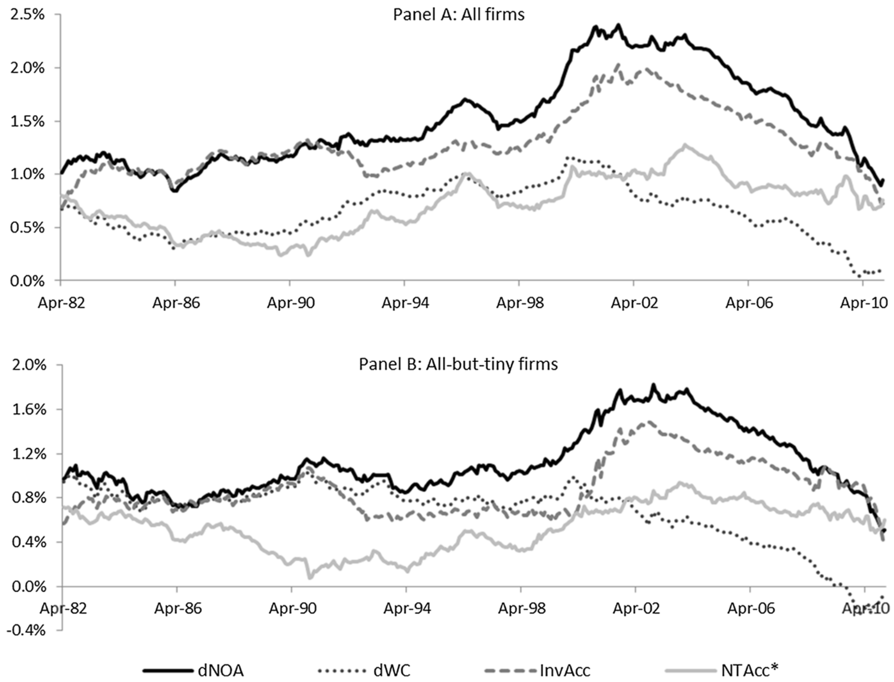

Fig. 2 Average monthly returns (10-year rolling windows) on long-short accrual strategies, 1982–2010. The figure plots 10-year average monthly returns, ending in the month indicated on the x-axis, for investment strategies based on total accruals (dNOA; *dark solid line*), working-capital accruals (dWC; *dotted line*), long-term investment (InvAcc; *dashed line*), and the component of nontransaction accruals that is uncorrelated with dWC and InvAcc (NTAcc*; *light solid line*). Each strategy invests in an equal-weighted portfolio of low-accrual stocks (*bottom decile*) and shorts an equal-weighted portfolio of high-accrual stocks (*top decile*) based on one of the four accrual measures. The variables, defined in Table 1, are updated once per year, 4 months after the firm's fiscal-year end. Accounting data come from Compustat and market data come from CRSP. The sample includes all nonfinancial firms on CRSP and Compustat with nonmissing data for current returns, dNOA, and net income. The all-but-tiny sample drops firms below the NYSE 20th percentile based on beginning-of-year market value

6 Conclusions

The accrual anomaly remains one of the most challenging asset-pricing anomalies to interpret because of the close link not only between accruals and earnings but also between accruals and investment. The second link makes it hard to test whether the market's reaction to accruals is due to a firm's underlying investment expenditures or to the way expenditures are recorded in the firm's financial statements.

Our paper is the first to distinguish explicitly between investment-related and non-investment-related accruals. The latter group, which we label nontransaction accruals, include items such as depreciation, amortization, asset write-downs, deferred taxes, and other accounting charges that are subject to substantial managerial discretion but do not represent new investment expenditures. Our central thesis is that nontransaction accruals should help to predict returns if investors fail to appreciate the low reliability and persistence of nontransaction accruals but not if investment drives the accrual anomaly, as proposed by Fairfield et al. (2003) and Wu et al. (2010).

Empirically, we find that nontransaction accruals have strong predictive power for subsequent stock returns, consistent with the earnings hypothesis. In Fama–MacBeth regressions, nontransaction accruals have the most negative predictive slopes for stock returns, with point estimates that are up to twice as large as the estimates on working-capital accruals and investment. The results provide strong evidence that investment does not fully explain the accrual anomaly.

More broadly, our evidence shows that working-capital accruals, long-term investment, and nontransaction accruals have very different predictive power for firm performance, not just for earnings but also for cash flow, free cash flow, and stock returns. Indeed, the predictive regression R^2s sometimes jump dramatically when the components of accruals are allowed to have different slopes. The results imply that our decomposition captures economically and statistically significant differences among different types of accruals. The results contradict the idea that the accrual anomaly is driven by a generic growth effect and suggest instead that different types of accruals capture different dimensions of firm performance.

It is useful to note that we have not tried to distinguish explicitly between risk and mispricing explanations for the accrual anomaly. However, our results are hard to reconcile with risk-based explanations proposed in the literature, which predict a link between stock returns and investment, not stock returns and nontransaction accruals (e.g., Khan 2008; Wu et al. 2010). Of course, nontransaction accruals might correlate with risk for reasons not captured by existing stories. One possibility is that a negative shock to a firm's investment opportunities could make the firm riskier and precipitate asset write-downs or other accounting charges that show up in nontransaction accruals today, reflecting the deteriorating value of a firm's assets. This would suggest that write-downs and large negative NTAcc might naturally be associated with higher expected stock returns, consistent with our evidence.

The problem for a risk-based story like the one above is that large negative NTAcc are associated, empirically, with *higher* M/B ratios and *higher* investment. Firms with large negative NTAcc do not have low operating cash flow, today or in the future, and continue to grow at least as rapidly as other firms. Our results are broadly consistent with Momentè et al.'s (2015) evidence that accruals' predictive power comes almost entirely from firm-specific accruals rather than industry-wide variation in accruals: the former are more likely to capture mispricing-based "distortions," while the latter are more likely to be driven by risk. In short, the evidence seems most consistent with a mispricing view in the spirit of Sloan (1996). But, again, our main conclusion is more basic: investment-based stories for the accrual anomaly—rational and irrational—do not explain many patterns in the data.

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Appendix

See Tables 10.

Table 10 Components of FFOther: 1998, 2002, 2006

Company	FFOther $	% assets	Components	$	% assets
Panel A: Examples from 1998					
Illinova Corp	−1520.5	−25.2	Impairment loss—net of tax	−1523.7	−25.3
			Allow. for funds during const.	3.2	0.1
MCN Energy Group Inc	−375.5	−8.6	Write-downs, losses, restr. chrgs.	−389.6	−8.9
			Other	14.1	0.3
United Cont. Hldgs Inc	−1058.0	−6.2	ESOP compensation expense	−829.0	−4.8
			Def. post-retirement expense	−149.0	−0.9
			Pension funding less than expense	−101.0	−0.6
			Other	21.0	0.1
Centerpoint Energy Inc	−1036.3	−5.5	Loss on indexed debt securities	−1176.2	−6.3
			Other	139.6	0.7
Adv. Fibre Comm Inc	−13.5	−4.7	Tax benefit from option exercise	−11.0	−3.8
			Provision for doubtful accounts	−3.7	−1.3
			Other	1.1	0.4
Nucor Corp	−102.5	−3.3	Minority interest	−102.5	−3.3
Aquila Inc	−183.0	−3.3	Change in risk mgmnt assets	−100.8	−1.8
			Divs from investments/prtnrshps.	−48.9	−0.9
			Provision for asset impairments	−27.7	−0.5
			Minority interest	−5.6	−0.1
Niag. Mohawk Hldgs	−383.4	−3.3	Powerchoice charge	−263.2	−2.2
			Amort. of MRA regulatory asset	−128.8	−1.1
			Other	8.6	0.1
OSI Restaurant Partners	−21.2	−3.3	Minority Interest	−21.2	−3.3
Mirage Resorts Inc	−113.6	−2.9	Preopening expense	−88.3	−2.2
			Provision for loss on receivables	−27.7	−0.7
			Other adjustments	2.4	0.1
MGM Resorts Intl.	−40.5	−2.6	Provision for doubtful accounts	−40.5	−2.6
Mcleodusa Inc—A	−35.2	−2.1	Accretion of int. on senior notes	−35.2	−2.1
Anadarko Petroleum	−71.2	−2.1	Impairments of intl prop.	−70.0	−2.1
			Amortization of restricted stock	−1.2	−0.0
Cinergy Corp	−197.7	−2.1	Unreal. loss from risk mgmnt.	−135.0	−1.4
			W.V. Power Assoc. settlement	−80.0	−0.8

Table 10 continued

Company	FFOther $	% assets	Components	$	% assets
			Other	17.3	0.1
Lexmark Intl Inc—CL A	−26.5	−2.0	Other non-cash charges	−26.5	−2.0
Lubrizol Corp	−29.9	−1.9	Special charges/asset impair.	−36.9	−2.4
			Other	7.0	0.5
AMF Bowling Inc	−36.7	−1.9	Amortization of bond discount	−36.7	−1.9
Columbia Energy Grp	−121.4	−1.8	Miscellaneous	−121.4	−1.8
Panamsat Corp	−89.1	−1.5	Insurance settlement	−184.0	−3.2
			Interest expense, capitalized	60.0	1.0
			Amort. of gains on sale leasebacks	36.1	0.6
			Other	−1.2	−0.1
Georgia-Pacific Timber	−18.0	−1.5	Other	−18.0	−1.5
Panel B: Examples from 2002					
CDW Corp.	−72.3	−7.1	Stock-based compensation	−70.6	−6.9
			Other	−1.7	−0.2
Biogen IDEC Inc.	−103.0	−6.4	Stock-based compensation	−74.4	−4.6
			Non-cash interest expense	−26.9	−1.7
			Other	−1.7	−0.1
Corp. Exec. Board Co.	−19.9	−6.4	Stock-based compensation	−18.4	−5.9
			Amort. of mark. sec. premium	−1.5	−0.5
Apria Healthcare	−46.4	−6.2	Provision for doubtful accounts	−45.1	−6.0
			Amort. of debt issuance costs	−1.3	−0.2
Pharm. Product Dev.	−34.4	−5.9	Asset impairment	−33.8	−5.8
			Other	−0.6	−0.1
Alliance Data Systems	−75.1	−5.1	Credit card rec. settlement—net	−49.2	−3.4
			FV loss on int. rate derivative	−12.0	−0.8
			Provision for doubtful accounts	−11.0	−0.8
			Other	−2.9	−0.1
Weight Watchers Int'l	−26.2	−4.8	Foreign currency exch. rate adj.	−17.1	−3.1
			Stock-based compensation	−6.3	−1.2
			Reserve for obsolete inventory	−2.7	−0.5
			Other	−0.1	−0.0
Bunge Ltd	−327.0	−4.7	Unrealized foreign exchange loss	−126.0	−1.8
			Minority Interest	−102.0	−1.5
			Provision for recoverable taxes	−44.0	−0.6
			Provision for doubtful accounts	−37.0	−0.5
			Other	−18.0	−0.3
West Corporation	−24.8	−3.9	Provision for doubtful accounts	−24.5	−3.9

Table 10 continued

Company	FFOther $	% assets	Components	$	% assets
			Minority Interest	−0.3	−0.0
Lifepoint Hospitals Inc.	−23.0	−3.6	ESOP expense	−9.7	−1.5
			Reserve for general liability claims	−9.2	−1.4
			Other	−4.1	−0.7
EOG Resources	−127.5	−3.5	Exploration costs	−60.2	−1.7
			Mark-to-market gains; derivatives	−48.5	−1.3
			Other—net	−13.6	−0.4
			ESOP expense	−5.2	−0.1
Therasense Inc.	−6.0	−3.2	Amort. of deferred stock comp.	−5.9	−3.1
			Provision for doubtful accounts	−0.1	−0.1
Mid Atlantic Med Srvcs	−20.9	−3.1	Stock compensation expense	−20.5	−3.0
			Provision for doubtful accounts	−0.4	−0.1
Burlington Resources	−318.0	−3.0	Exploration costs	−286.0	−2.7
			Changes in derivative fair values	−32.0	−0.3
Vector Group Ltd.	−19.9	−2.8	Provision for uncoll. note rec.	−13.2	−1.9
			Minority Interest	9.5	1.4
			Provision for loss on invest.	−6.8	−1.0
			Non-cash interest expense	−5.1	−0.7
			Other	−4.3	−0.6
Polaris Industries Inc.	−16.2	−2.8	Non-cash compensation	−16.2	−2.8
Powerwave Tech.	−9.8	−2.7	Provision for obsolete inventory	−5.8	−1.6
			Provision for doubtful accounts	−4.0	−1.1
Amer. Pharm. Prtnrs.	−6.0	−2.6	Stock-based compensation	−4.7	−2.0
			Imputed int. on liab. to VivoRx	−1.3	−0.6
Bruswick Corp.	−70.3	−2.2	Income taxes	−64.3	−2.0
			Other	−6.0	−0.2
Covance Inc.	−13.7	−2.1	Stock-based compensation	−11.7	−1.8
			Other	−2.0	−0.3
Panel C: Examples from 2006					
NVR Inc	−230.3	−9.7	Land deposit impairments	−173.8	−7.3
			Mortgage loan settlement—net	−63.7	−2.7
			Other	7.3	0.3
HCA Holdings Inc	−2181.0	−9.5	Provision for doubtful accounts	−2660.0	−11.6
			Income Taxes	552.0	2.4
			Other	73.0	−0.3
Ultra Petroleum Corp	−96.7	−9.2	Deferred/non-cash income taxes	−105.7	−10.0
			Other	9.0	0.8
Intuitive Surgical Inc	−36.9	−6.3	Amort. of deferred comp.	−25.3	−4.3

Table 10 continued

Company	FFOther $	% assets	Components	$	% assets
			Stock-based compensation	−5.2	−0.9
			Income tax benefits—acquisition	−6.4	−1.1
Smith International Inc	−248.6	−5.3	Minority interests	−191.4	−4.1
			Stock-based compensation	−27.3	−0.6
			Increase in LIFO Reserves	−18.9	−0.4
			Other	−11.0	−0.2
DirecTV	−697.0	−4.5	Deferred income taxes	−770.0	−5.0
			Gain on disposition of business	117.7	0.8
			Other	−44.7	−0.3
OSI Restaurant Partners	−95.6	−4.5	Stock-based compensation	−70.6	−3.3
			Provision for impaired assets	−14.2	−0.7
			Other	−10.8	−0.5
Celgene Corp	−87.2	−4.4	Stock-based compensation	−76.7	−3.9
			Other	−10.5	−0.5
Alliance Data Systems	−133.4	−4.2	Credit card rec. settlement—net	−80.8	−2.6
			Provision for doubtful accounts	−38.1	−1.2
			Other	−14.3	−0.4
MDC Holdings Inc	−157.7	−4.1	Asset impairments	−112.0	−2.9
			Writeoffs of land option deposits	−29.7	−0.8
			Other	−16.0	−0.4
C H Robinson	−54.4	−3.6	Stock-based compensation	−47.3	−3.1
			Provision for doubtful accounts	−7.1	−0.5
Frontline Ltd	−162. 8	−3.6	Minority interest	−158.7	−3.5
			Derivative adj. to market value	−9.4	−0.2
			Other	5.3	0.1
Nucor Corp	−252.5	−3.3	Minority interest	−219.2	−2.9
			Stock-based compensation	−40.1	−0.5
			Other	6.8	0.1
Altera Corp	−66.6	−3.3	Stock-based compensation	−66.6	−3.3
Cognizant Tech	−33.8	−3.1	Stock-based compensation	−32.3	−2.9
			Provision for doubtful accounts	−1.5	−0.2
FMC Technologies Inc	−64.3	−2.8	Employee benefit plan costs	−52.0	−2.3
			Other	−12.3	−0.5
Navteq Corp	−18.3	−2.6	Stock-based compensation	−14.5	−2.0
			Provision for bad debt	−2.6	−0.4
			Other	−1.2	−0.2
Covance Inc	−28.8	−2.5	Stock-based compensation	−30.4	−2.6
			Other	1.6	0.1
Lincare Holdings Inc	−40.3	−2.3	Bad debt expense	−21.1	−1.2

Table 10 continued

Company	FFOther $	% assets	Components	$	% assets
			Stock-based compensation	−19.2	−1.1
Garmin Ltd	−35.8	−2.2	Provision of obsolete inventory	−23.3	−1.4
			Stock appreciation rights	−11.9	−0.7
			Other	−0.6	−0.1

This table reports the components of Funds from Operation-Other (FFOther, in $ millions and % of total assets) for the 20 largest firms in the sample that had big negative FFOther (in the bottom one-third of the sample when firms are sorted by FFOther scaled by average assets) but no special items in 1998 (Panel A), 2002 (Panel B), and 2006 (Panel C). The components of FFOther are taken from the statement of cash flows in the firm's 10-K, manually downloaded from the SEC's Edgar website

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