Earnings Quality and Stock Returns

Konan Chan, Louis K. C. Chan, Narasimhan Jegadeesh and Josef Lakonishok*

February 2004

*Department of Finance, National Taiwan University, Taipei 106, Taiwan(K. Chan); Department of Finance, College of Business, University of Illinois at Urbana-Champaign, Champaign, IL 61820 (L. Chan and Lakonishok); Department of Finance, Goizueta Business School, Emory University, Atlanta GA 30322 (Jegadeesh), and NBER (Lakonishok). We thank Theodore Sougiannis, Siew Hong Teoh, as well as participants at the American Finance Association 2001 Meetings and the Berkeley Program in Finance Spring 2002 seminar for helpful comments and suggestions.

Abstract

An exclusive focus on bottom-line income misses important information about the quality of earnings. Accruals (the difference between accounting earnings and cash flow) are reliably, negatively associated with future stock returns. Earnings increases that are accompanied by high accruals, suggesting low-quality earnings, are associated with poor future returns. We explore various hypotheses — earnings manipulation, extrapolative biases about future growth, and under-reaction to changes in business conditions — to explain accruals' predictive power. Distinctions between the hypotheses are based on evidence from operating performance, the behavior of individual accrual items, discretionary versus nondiscretionary components of accruals, and special items. We check for robustness using within-industry comparisons, and data on U.K. stocks.

Security analysts, firm managers, and investors all devote a great deal of attention to firms' reported earnings. Forecasts of earnings are widely disseminated in the financial press, and revisions in analysts' forecasts are closely followed. Managers are keenly interested in maintaining growth in earnings because their compensations are often tied to their firms' profits. News that a firm has fallen short of earnings expectations can immediately send its stock price plummeting; firms that beat expectations, on the other hand, are handsomely rewarded by investors.

The focus on earnings is so intense that it has been suggested that the market fixates on firms' bottom line income, to the exclusion of other indicators of operating performance. Such single-minded attention fails to recognize that reported net income is the result of an extended accounting process with considerable room for managerial discretion at every step. The perils of focusing exclusively on bottom-line earnings are vividly highlighted by the recent spate of corporate accounting scandals. Given the heightened attention to accounting income, managers have an incentive to be aggressive in applying accounting rules so as not to disappoint investors and analysts. The Securities and Exchange Commission (2003) cites hundreds of cases where managers have used accounting maneuvers to puff up their firms' profits. Examples of high-profile firms that have inflated earnings for extended periods include Enron, Tyco International and Xerox.

As a result, there have been growing concerns about firms' "quality of earnings," or the extent to which reported earnings reflect operating fundamentals. In the context of stock prices, to the extent that the market fixates on reported income and does not take into account the quality of firms' earnings, there may be temporary deviations of prices away from their correct values. Put another way, measures of earnings quality may have predictive power for future movements in stock prices.

This paper examines whether, and why, there is information in earnings quality for future stock returns. We focus on one measure, accounting accruals, which has recently gained attention as a potentially important indicator related to earnings quality, and which may be useful for equity valuation. Accruals represent the difference between a firm's accounting earnings and its underlying cash flow. Large positive accruals indicate that earnings are much higher than cash flows. Earnings and cash flow can differ because accounting conventions with respect to the timing and magnitude of revenues and expenses (the so-called "revenue recognition" and "matching" principles) are not necessarily based on cash inflows and outflows. Some

revenues can be counted toward earnings in the current period, for example, even though they have not yet been received in cash. Similarly, certain expenses (such as depreciation) are deducted from revenues even though they entail no cash outlays.

Sloan (1996) finds that stocks with high accruals, signifying earnings are high relative to cash flows, subsequently have lower returns and under-perform stocks with low accruals. One popular interpretation of this evidence, which serves as the explanation by default, equates accruals with managerial book-keeping mischief (see, for example, Abarbanell and Lehavy (2000)). Academic evidence supporting the existence of managerial manipulation of earnings is provided in Friedland (1994), Degeorge, Patel and Zeckhauser (1999), and Teoh, Welch and Wong (1998a, 1998b). As managers inflate earnings above cash flows, accruals rise. High accruals may reflect, for example, increases in accounts receivable as managers record sales prematurely, or decreases in current liabilities as managers understate liabilities such as warranty expenses. Since investors fixate on reported bottom-line income, they are temporarily fooled. This viewpoint has far-reaching consequences. It suggests, for instance, that it may be necessary to limit managers' discretion with respect to accounting, since investors apparently cannot unravel the valuation effect of reported earnings in a timely manner under current reporting standards.

Such an interpretation may be premature. There is some evidence that accounting accruals are above average for firms subject to enforcement actions by the SEC (see Dechow et al. (1996)). However, there is no documented evidence that managers deliberately manipulate earnings through accruals for firms with high accruals in general. The level of accruals thus serves as a coarse measure of earnings manipulation. If manipulation is not the culprit, reforms to limit managerial flexibility may be counter-productive. Accordingly, we also explore several other hypotheses about why accruals are associated with subsequent returns. These hypotheses draw on the idea that the effect of accruals may stem from the same patterns of investor behavior as other widely-documented regularities in stock returns, such as the book-to-market effect as well as price and earnings momentum. Explanations for these phenomena have been developed in recent research on behavioral finance (see Barberis and Thaler (2002), Hirshleifer (2001) for surveys of this literature).

In particular, accruals are driven by changes in working capital, which in turn tend to rise with sales. A high level of accruals may thus be a reflection of strong past growth in sales. Some evidence from studies

in psychology suggest that individuals extrapolate past trends from short histories too far into the future (see the discussion in Shleifer (2000)). For example, managers of growing firms with high accruals may be lulled into thinking that there is much stronger persistence in sales growth than is the case. They build up inventories and other working capital items on the basis of inflated expectations. Similarly, analysts and investors tend to anchor too heavily on past growth in their forecasts and valuations (De Bondt and Thaler (1990), La Porta (1996), La Porta, Lakonishok, Shleifer and Vishny (1997), Chan, Karceski and Lakonishok (2003a)). As a result, the market pricing of firms with high accruals is built on an overoptimistic estimate of future growth rates, so future returns are likely to turn out to be disappointing.

Another explanation is that the components of accruals contain information about operating performance but the market reacts to this information slowly. The components of accruals, such as changes in inventories, receivables, and payables are commonly used by security analysts as indicators of business conditions. A firm that faces difficulties in generating sales or is over-producing, will experience a build-up of inventories. Similarly, poor sales or credit difficulties may lead to a rise in payables. While firms with high accruals are not necessarily falling into financial distress, the components of accruals pick up early signs that sales growth is slowing, even though the bottom-line earnings number remains healthy for the time being. There is extensive evidence that the market responds with a delay, or underreacts, to the information in various accounting numbers (see, for example, Bernard and Thomas (1989), Chan, Jegadeesh and Lakonishok (1996), Abarbanell and Bushee (1998), and Piotroski (2000)). Such a pattern of under-reaction may reflect another behavioral trait documented in the psychology literature, namely that individuals are too slow in updating their beliefs when new evidence arrives (see Edwards (1968)). Accordingly an alternative hypothesis is that there is a slow response to the information contained in accruals. In particular, accruals rise as a result of a relative slowdown in business conditions, but initially the market does not fully respond to this signal. As a result accruals lead the subsequent negative stock price reaction.

Our analysis of the predictive power of accruals for stock returns confronts these hypotheses — earnings manipulation, extrapolative biases concerning future growth, or under-reaction to business conditions. We distinguish between these explanations along the following dimensions. First, we examine the operating performance of firms with high and low accruals. Specifically we check whether the timing of changes in

accruals coincides with the timing of changes in underlying profitability, as proxied by indicators such as sales turnover, or operating profit margin. Second, we examine the individual components of accruals (including accounts receivable, inventories and accounts payable). Some items give managers more discretion (for example, with regard to the timing of revenue recognition) so focusing on such items may highlight the effects of manipulation. Hribar(2000) and Thomas and Zhang (2002), for instance, focus on the relation between inventory changes and future stock returns. Importantly, the predictions of the earnings management and under-reaction hypotheses differ for some components of accruals. Under the conventional interpretation that accruals solely reflect earnings manipulation, an increase in accounts payable is a favorable event because it reduces accruals. However increases in payables, to the extent that they signal difficulties in meeting payments, should be unfavorable from the standpoint of the underreaction hypothesis. Third, we decompose accruals into nondiscretionary and discretionary components and examine the information in each component for returns. Our analysis differs from the earlier work in Jones (1991) and Xie (2001) because our decomposition is based on sales growth. An increase in sales may, for instance, give rise to an increase in inventories and accounts receivable, thereby raising the nondiscretionary component of accruals. If extrapolative biases are boosting investor valuations of firms with high accruals the nondiscretionary, sales-related, accrual component should do well in predicting future returns. On the other hand, the manipulation hypothesis and underreaction hypothesis suggest that only the discretionary component of accruals that is unrelated to sales growth should predict future returns. Fourth, we focus on the behavior of special items for firms with relatively high levels of accruals. Special items are intended to capture the impact of unusual or nonrecurring events on a firm's income statement (such as inventory writedowns). If managers manipulate earnings, the effects of the manipulation will ultimately unwind, and it is likely that the corrections are reported as special items in subsequent years (although financial statements generally do not spell out the nature of the transactions reported under special items). We thus track special items to pick up the footprints of earnings manipulation in prior years.

Our robustness checks extend the available evidence in two new directions. First, we verify that accruals predict returns within industries. Since working capital requirements differ across lines of business, the level of accruals and hence their potential influence vary across industries. The association between accruals and

returns is likely to be stronger in industries where non-cash working capital makes up a larger component of firms' assets. Second, all the extant literature examines the effect of accruals with U.S. data. This raises the possibility that the association between accruals and returns is spurious, and arises from collective data-snooping. To address this issue, we also use data from the United Kingdom. The U.K. stock market is the second largest after the U.S. in terms of capitalization with accounting conventions that closely match those in the U.S., but it has not been previously studied in this context.

These are our main findings. Accruals are reliably, negatively related to future stock returns, as first documented by Sloan (1996). Firms with high current accruals experience a sudden, large increase in accruals over the prior year, accompanied by a substantial deterioration in cash flows. The high accrual years mark a turning point in the fortunes of these firms. Firms with large accruals exhibit high levels of past earnings and sales growth. They continue to report growing earnings even as accruals are high and only in the subsequent year do earnings show signs of deterioration. Accordingly, the time series behavior of accruals and operating performance for firms with the largest accruals gives strong evidence that managers are manipulating earnings, and the market is initially misled. Furthermore, in subsequent years, the amount of income-decreasing special items relative to total assets is larger for the firms with high accruals.

We also find that the non-discretionary component of accruals, constructed by extrapolating past trends in sales growth and accruals, does not predict future returns. Xie (2001), using different methods, finds a similar result. This evidence is not consistent with the extrapolation hypothesis.

The evidence on accruals' predictive power is robust. Comparing homogeneous sets of firms within an industry, higher accruals are associated with lower returns. Similar results also emerge from U.K. stocks. In particular, we find that in the U.K. accruals help predict returns, and that changes in inventory are by far the most important component of accruals for predicting returns.

In a larger context beyond why accruals predict returns, our results reinforce the growing evidence that the quality of earnings matters. When an increase in earnings is accompanied by high accruals, suggesting low-quality earnings, subsequent stock returns are sub-par. Notably, in a two-way classification, the marginal contribution of accruals in predicting returns exceeds the contribution of earnings surprises. The joint importance of accruals and earnings surprises is also emphasized by Collins and Hribar (2000).

Two points deserve mention at the outset. First, even under the conventional notion that accruals represent opportunistic manipulation by managers, the effects of high and low accruals may not be symmetric. Given the attention devoted by investors and the media to companies' short-term earnings performance, there are intense pressures to paint a rosy picture of a firm's earnings prospects (see, for example, Chan, Karceski and Lakonishok (2003b)). In comparison, the motives to lower current earnings and defer them to the future are less compelling. Accordingly, traces of manipulation are more likely to be present when accruals are high than when accruals are low. Secondly, the hypotheses are not mutually exclusive. When sales growth starts to slow, for example, managers may face mounting pressures to inflate earnings in order to meet analyst forecasts, thereby leading to an increase in accruals. These pressures may be stronger insofar as investors and analysts maintain exaggerated expectations about future profitability growth. At the same time, inventory may start to accumulate as sales growth declines, and accounts receivable may rise as competitive pressures force firms to extend better credit terms, so accruals increase. In short, any stark distinctions between the hypotheses may be artificial, so an eclectic interpretation may be more appropriate. In their examination of the evidence, Thomas and Zhang (2002) arrive at a similar conclusion.

The rest of the paper is organized as follows. Section 1 outlines the connections, as well as differences, between our work and related studies in the accounting research literature. This section also describes the sample and helps to motivate the importance of earnings quality through a simple two-way classification. Section 2 documents the accrual effect. Various hypotheses as to why accruals predict returns are explored in section 3. The results from cross-sectional regressions are reported in section 4. Tests for robustness are provided in section 5. Section 6 concludes.

1 Preliminaries

1.1 Related research

Financial researchers' interest in accruals can be traced back to the extensive literature documenting the predictability of the cross-section of returns based on firm profitability measures. In particular, a large number of papers uses earnings-price ratios (the ratio of net income to stock price) to explain the cross-

section of future returns (Basu (1977), Chan, Hamao and Lakonishok (1991), Fama and French (1992)). Net income is a noisy measure of operating performance, however. Managers have much leeway with respect to the timing and measurement of revenues and expenses, so earnings can be manipulated. Further, special items such as restructuring charges and write-offs can have large temporary effects on earnings.

Several papers use cash flow (earnings plus depreciation) relative to price as an improved measure of profitability. Compared to earnings, cash flow measures are in general less volatile and more difficult to manipulate by managers. Moreover, there is no consensus in the investment industry as to the best measure of cash flow, so even if managers had the capability, it is not clear what they would manipulate. Perhaps for these reasons cash flow yield generally has stronger explanatory power for returns. For example, in one-way sorts by earnings-price ratios, the extreme deciles of stocks have differences in annual returns of about 3.9 percent over the subsequent year (Lakonishok, Shleifer and Vishny (1994)). When sorted by cash flow to price ratios, the return spreads are about 9.9 percent.[1] The upshot is that at least one component of accruals, depreciation, adds information beyond net income. More generally, Rayburn (1986), Wilson (1987), Bowen et al. (1987), Bernard and Stober (1989), Houge and Loughran (2000) find that stock prices respond to innovations in accruals (which include not only depreciation but also changes in other working capital accounts) as well as innovations in operating cash flows.

Sloan (1996) documents an intriguing return anomaly associated with accruals. He finds that stocks with large positive (income-increasing) accruals in a given year tend to have low returns in subsequent years. These stocks have an average size-adjusted return of -5.5 percent in the following year. Collins and Hribar (2000) confirm this finding with quarterly accruals. One interpretation of these results is that large positive accruals are a symptom of earnings management, but investors do not realize this and are misled into believing that future profitability will stay high. Numerous researchers examine whether the mispricing can be traced to the portion of accruals that reflects opportunistic managerial behavior (discretionary accruals). Jones (1991) develops a model to parse out the discretionary and nondiscretionary components of accruals. Using this model, Subramanyam (1996) and Xie (2001) show that discretionary accruals predict returns, but the nondiscretionary component does not. Thomas and Zhang (2002) examine the importance of the

[1] In either case, only firms with positive earnings or cash flow are considered.

different components of working capital changes.

Some, but not all, of our results echo the findings of these other studies. What is generally missing from this earlier literature, however, is an evaluation of the economic reasons for the relation between accruals and returns. In the absence of such an explanation, one cannot dismiss the charge that the effect of accruals is a statistical fluke which does not extend to other samples or other periods. In this respect, our tests to discriminate between the underlying hypotheses are novel contributions. Other aspects of our analysis are also new. We see what happens to the operating performance and special items of firms that have high or low accruals, so as to get a sharper picture of whether managers are manipulating earnings to disguise their sagging prospects. Similarly we generate new ways of measuring discretionary and non-discretionary accruals. Some industries have larger working capital requirements than others, so the importance of accruals need not be uniform across industries. Our analysis at the level of industries hence yields potentially more powerful tests of the relation between accruals and returns. We also provide original evidence from the U.K., which is second in market size to the U.S. and affords high-quality accounting data. The various working capital accounts can provide different information about returns that is masked when working with total accruals. Accordingly, we estimate predictive regressions that allow the components of accruals to have differential effects on returns. These let us develop trading strategies that improve on results reported in the previous literature.

1.2 Sample and methodology

The sample comprises all firms listed on the New York (NYSE), American (AMEX) and Nasdaq markets which are covered on both the Center for Research in Security Prices (CRSP) file as well as the Compustat files (current and research). We consider only domestic, primary stocks and exclude closed-end funds, investment trusts, units and foreign companies. Following related accounting studies in this area, financial firms (with SIC codes 6000–6999) are dropped from the sample.[2]

[2]To mitigate return measurement problems with small, low-priced stocks we exclude any stock trading as of the portfolio formation date at a price below $5 that falls in the bottom three deciles of market capitalization, based on NYSE breakpoints.

We follow Sloan (1996) and measure accruals as:

$$\begin{aligned} Accruals &= \Delta CA - \Delta CL - DEP \\ &= (\Delta AR + \Delta INV + \Delta OCA) - (\Delta AP + \Delta OCL) - DEP. \end{aligned} \quad (1)$$

ΔCA is the change in non-cash current assets, given by the change in current assets (Compustat annual data item 4) less the change in cash (item 1). ΔCL is the change in current liabilities excluding short-term debt and taxes payable, given by the change in current liabilities (item 5) minus the change in debt included in current liabilities (item 34) and minus the change in income taxes payable (item 71). DEP is depreciation and amortization (data item 14). The components are further defined as ΔAR the change in accounts receivable (item 2); ΔINV the change in inventories (item 3); ΔOCA the change in other current assets (item 68); ΔAP the change in accounts payable (item 70); and ΔOCL the change in other current liabilities (item 72). As the magnitudes of all these items vary with the overall size of the firm's balance sheet, we follow the accounting literature and scale each item by average total assets (the average of total assets, Compustat data item 6, at the beginning and end of the fiscal year).[3] Since we are interested in firms' operating performance we focus on profitability before financing costs and taxes. Our measure of earnings is thus operating income after depreciation (before interest expense, taxes and special items), corresponding to Compustat annual data item 178.

We measure all variables at the end of April each year from 1971 to 1995.[4] We assume that there is a four-month delay between the end of a firm's fiscal year and when the accounting information becomes

[3] Accruals are measured under Sloan's (1996) approach as changes in the working capital accounts from the balance sheet. Firms that have undergone a merger/acquisition (or a divestiture) are thus more likely to be categorized as firms with high (or low) accruals. Since the subsequent stock returns of firms involved in mergers and acquisitions tend to be below average, high accruals may be associated with poor future returns on this account. To circumvent this problem, Collins and Hribar (2002) use an alternative measure of accruals that is based on the statement of cash flows. Their alternative measure continues to predict returns, and moreover yields a spread in returns that is larger than the spread based on the conventional approach. Since the measurement issue is not likely to be the explanation for the accrual effect, we do not consider it in our analysis. Moreover, firms were generally not required to disclose their cash flow statements before 1988. To obtain as long a sample period as possible, we therefore follow the conventional approach based on the balance sheet to measure accruals.

[4] Our analysis begins in 1971 because prior to that year there are fewer than 400 firms with available data on the required accounting items.

publicly known. All firms with available data are included in the sample, regardless of their fiscal year-ends. Table 1 summarizes the accounting variables. Panel A provides descriptive statistics on the components of working capital; panel B presents statistics on earnings, cash flow, accruals and the individual accrual items.[5]

Accruals comprise the changes in various working capital accounts, so to give some perspective we begin by examining the underlying working capital items in panel A. Current assets is the dominant item, representing 47.1 percent of total assets for the median firm. Accounts receivable and inventory make up the bulk of current assets, with each item accounting for more than 20 percent of total assets for a typical firm.

Panel B provides information on the individual accrual items. The largest accrual item is depreciation, but it displays little variability across firms, as evidenced by the low standard deviation. The items that contribute most to differentiating accruals across firms are changes in accounts receivable and changes in inventory. The standard deviation of each of these items exceeds 7 percent. Total accruals displays large cross-sectional variability, with a standard deviation of 10.2 percent. This variability is close in magnitude to the average level of earnings (as a percent of total assets). The implication, then, is that changes in accruals that may not appear unusual can lead to substantial changes in reported earnings.

1.3 The importance of earnings quality

To help motivate the remainder of the paper, we first examine the potential importance of looking beyond the bottom-line earnings number and considering accruals as well. The cross-sectional predictive power of earnings surprises for future returns is widely documented (see, for example, Latane and Jones (1979), Foster, Olsen and Shevlin (1984), Bernard and Thomas (1989), Chan, Jegadeesh and Lakonishok (1996)). However, it may not be meaningful to compare firms with large and small earnings surprises without some adjustment to separate cases where firms are improving their underlying cash flow performance from cases where they may be "cooking the books". In this respect, adjusting net income to reflect the quality of earnings may be important. Table 2 checks whether we can refine the predictive power of earnings surprises

[5] Each year we calculate the percentiles of the distribution across all firms in the sample that year. The quartiles reported in Table 1 are the simple means of these statistics over all years in the sample period.

for returns by taking into consideration accruals as a (crude) measure of the quality of earnings.

Table 2 assigns stocks to portfolios on the basis of a two-way classification. We group stocks at the end of each April over the sample period into one of five categories based on earnings surprise. Our indicator of earnings surprise is the change in earnings from a year ago, relative to average total assets.[6] At the same time stocks are independently classified into quintile groups based on accruals relative to average total assets. The intersection of these two classifications gives twenty five categories; stocks are equally-weighted within each group.

We report annual buy-and-hold returns and abnormal returns for each portfolio in the first year after portfolio formation. Size and book-to-market adjusted abnormal returns are computed as follows. Each April we calculate quintile breakpoints for size (market value of equity) based on NYSE stocks. Since the bottom quintile of firms contains a disproportionately large number of firms (mostly Nasdaq stocks) we break this group out into two categories (the first and second decile of the distribution of firm size). Accordingly there are six categories by firm size. Independently we calculate quintile breakpoints for the ratio of book-to-market value of equity. The intersection of these two classifications gives thirty groups. We calculate buy-and-hold returns for equally-weighted portfolios of the stocks within each group. Based on where a stock falls given the size and book-to-market breakpoints, it is assigned one of these portfolios as a control. The abnormal return for a stock is the difference between its raw return and the return of the control portfolio.

In line with results from previous studies, a measure of earnings surprise predicts stock returns. To assess the marginal contribution of earnings surprise, we calculate the spread in returns between the top and bottom quintiles by earnings surprise for each of the five categories of accruals. The spreads are reported in the last row of each panel in Table 2. The average spread in abnormal returns is 4.2 percent per year. Importantly, the marginal contribution of accruals is larger. From the last column in panel B, the spread in abnormal returns between the top and bottom quintiles by accruals averages 6.2 percent. Even when the earnings surprise is most favorable and one expects positive abnormal returns on the basis of prior research,

[6] At each portfolio formation date current earnings is the earnings number as of the most recently ended fiscal year, assuming a four-month publication delay.

abnormal returns turn out to be negative if accruals are high. When accruals are high, abnormal returns are negative across all categories of earnings surprise. Holding fixed earnings surprise, returns become more disappointing as accruals rise. To summarize, the evidence in Table 2 suggests that the market may be temporarily misled by focusing on the bottom line and ignoring information about the quality of earnings, as proxied by accruals. This result echoes Collins and Hribar (2000), who find that the magnitude of the drift in returns following extreme earnings surprises depends on whether the change in earnings is accompanied by high or low accruals.

2 The accrual effect

2.1 Accruals and stock returns

Table 3 examines the characteristics and returns of stocks classified by accruals. At the end of April each year, we rank stocks by accruals relative to average total assets and assign them to one of ten equal-sized portfolios. Annual buy-and-hold returns and abnormal returns for these equally-weighted decile portfolios are calculated for each of the three years following portfolio formation.[7]

Panel A of Table 3 describes the average levels of accruals, cash flows, earnings and accrual components for the decile portfolios (all measured as of the portfolio formation date). In the portfolio of the highest-ranked stocks, accruals average 18.9 percent of total assets while in the portfolio of lowest-ranked stocks accruals are -16.2 percent of total assets. Accruals are positively correlated with earnings, but negatively correlated with cash flow. Earnings relative to total assets are 17.6 percent for the top decile portfolio, but only 7.1 percent for the bottom decile portfolio. Despite their very high earnings, firms in the top decile portfolio generate negative cash flows because of high accruals. The firms in the bottom decile portfolio, on the other hand, produce substantial cash flows in spite of their low earnings due to their negative accruals.

Panel B shows that firms with high accruals tend to be growth stocks with low book-to-market ratios.

[7] If a stock is delisted in a year subsequent to portfolio formation, we use the return on the CRSP value-weighted return from that point on until the end of the holding period. At the beginning of the next holding period we rebalance all remaining stocks in the portfolio to equal weights and compute returns for the following year.

Further, they have performed well in the past: growth in sales averages 22.8 percent per year in the three years leading up to portfolio formation. Panels C and D provide additional evidence on the superior past performance of the firms ranked highest by accruals. The average stock return on this group is 35.9 percent per year over the three prior years, and past abnormal returns are large.[8] However, the extraordinary past stock price performance is mainly driven by the large returns three and two years before portfolio formation. One year prior to portfolio formation, their returns, while above average, are less stellar. The rise in accruals for this portfolio, at the same time that its performance undergoes a relative slowdown, is not inconsistent with the idea that managers manipulate earnings to maintain favorable investor sentiment. Further, the lofty valuations of the firms with large positive accruals probably provides managers with an added incentive to manipulate earnings in order to maintain earnings growth and avoid negative earnings surprises.

Past studies (see, for example, Jegadeesh and Titman (1993), Chan, Jegadeesh and Lakonishok (1996)) document continuations in price trends over intermediate horizons. On this basis the above-average past returns of the portfolio with high accruals suggests that returns should continue to be relatively high in the year following portfolio formation. To the contrary, in the first post-formation year the top decile portfolio has an average return of only 9 percent (the overall return in the first year averaged across all the decile portfolios is 15.6 percent). The lowest-ranked decile portfolio has an average return of 17.8 percent, so that the return differential between the low- and high-accruals portfolios is 8.8 percent (the 't'-statistic for the difference is 3.79).[9] However much of the difference in returns stems from the relatively poor performance of the high-accruals portfolio. The spread in return between the second and ninth decile portfolios, for example, is only 3.8 percent. Average returns continue to be disappointing for the high-accruals portfolio in the second and third years after portfolio formation.

[8]Recall that, in order to mitigate problems with extreme returns in the years following portfolio formation, we exclude from our sample any stock which in the portfolio formation year is priced below $5 and which falls in the bottom three deciles of market capitalization based on NYSE stocks. This exclusion rule tends to drop firms that have had poor past returns, so the overall average return across the ten portfolios in the pre-formation period tends to be higher than the overall mean return in the post-formation years. Nonetheless, when all stocks are included it is still the case that the high-accruals portfolio tends to have superior past performance.

[9]The predictive power of accruals for returns is originally documented in Sloan (1996).

The portfolio returns after adjusting for size and book-to-market effects (Panel D of Table 3) tell the same story as the raw returns. Mean abnormal returns differ by 7.4 percent between the low- and high-accruals portfolios in the first post-formation year. The bulk of the difference is due to the low abnormal return on the high-accruals portfolio (-4.7 percent), whereas the abnormal return for the low accrual portfolio is relatively small (2.6 percent).[10] The differences in abnormal returns across the extreme decile portfolios may stem from differences in the incentives to manipulate earnings upward or downward. In particular, if managers are manipulating earnings, they are more likely to inflate earnings than to decrease or smooth earnings. As a result, the potential impact of manipulation on returns may be more apparent in the portfolio with high positive accruals. In summary, accruals predict future returns, although the effect is largely driven by the poor performance of the portfolio with the highest accruals, where the incentive to manipulate earnings may be the strongest.

2.2 Operating Performance

To get some insight into the reasons behind the large divergence between earnings and cash flows, we examine the portfolios' operating performance before and after portfolio formation. Figure 1 plots selected balance sheet items and operating performance measures for the extreme deciles over the five years before and after portfolio formation. The underlying statistics are provided for all decile portfolios in Appendix Table A1.

At the portfolio formation year-end, average accruals for the highest-ranked portfolio are 18.9 percent of assets. In comparison, this portfolio's average accruals are less than 6 percent of assets in the other pre-formation years. Accruals in the case of the lowest-ranked decile portfolio behave similarly, only in the opposite direction. Two items are chiefly responsible for the sudden change in accruals: inventories and accounts receivable. By their nature, accruals should be mean-reverting. Inventories and accounts receivable may rise temporarily as business conditions slow down, for example. However, it is unlikely

[10]The results are robust to assumptions about the delay in the release of accounting data. When we replicate Table 3 using only firms that announce earnings no later than the end of April in the formation year, the average spread in abnormal returns over the first subsequent year is 9.8 percent with a t-statistic of 6.43. We also obtain results that are qualitatively similar to those in Table 3 if we move the portfolio formation date to the end of June each year.

they will continue climbing at the same rate for several successive years, once production and marketing decisions are adjusted. Similarly, if managers manipulate earnings by recognizing revenues prematurely, current accruals rise but there will be some accompanying decline in future accruals. Figure 1 confirms that the extreme accruals are quickly reversed in the year after portfolio formation, and the pattern in the post-formation period is similar to the pre-formation period.

There are several possible explanations for the changes in accruals. Accruals may grow if managers expect sales to grow in the near future. For instance, managers may build up inventory in anticipation of large increases in future sales. However, the performance of sales in the post-formation period for the top decile portfolio does not seem to warrant such expectations. In fact, sales relative to assets (sales turnover) drops in the first post-formation year, and continues to decline over the subsequent years. In short, it is unlikely that these firms were building up inventory to meet growing demand.

It is likely that changes in current business conditions, or managerial manipulation of earnings, account for the sudden jump in accruals for the top decile portfolio. A slowdown in sales growth relative to expectations, for example, may initially result in an increase in inventory. In the event of a slowdown, competitive pressures may compel firms to offer more attractive credit terms to support sales, thereby raising accounts receivable. While sales growth and earnings stay positive in the years after portfolio formation for firms with high accruals, Figure 1 and Table A1 confirm that the dazzling growth of their pre-formation years has cooled. However, the timing of the slowdown in sales and earnings (relative to total assets) seems to occur one year after the jump in accruals, rather than contemporaneously. The delay raises the suspicion that managerial manipulation may be contributing to the jump in accruals during the portfolio formation year. Managers may have seen signs of weakness in sales over the year leading up to the portfolio formation date, and they attempt to delay its impact on the bottom line. In particular, managers have considerable latitude as to when expenses or revenues are recognized. To avoid a disappointing earnings report, for example, managers may delay writing off obsolete inventory or allocate more overhead to inventory. This results in an inflated valuation of inventory and at the same time a reduction of expenses, and hence higher reported earnings. Similarly, some of the growth in sales in the portfolio formation year may be due to managers' booking revenues before the sales are completed.

In any event, the upshot from Figure 1 is that an improvement in earnings when accompanied by an increase in accruals (and hence a reduction in cash flow) is an early warning sign of a relative deterioration in future operating performance. The decline in operating performance is accompanied by sub-par stock returns (Table 3).

The operating performance of firms with low accruals also reveals an interesting pattern, although any evidence of manipulation here is somewhat less apparent. The popular belief is that firms store some earnings in the form of accruals in good years so that they can tap into such earnings in bad times. For example, firms may be more aggressive in writing off bad debt and obsolete inventory at times when the bottom line earnings number offers sufficient cushion to absorb such write-offs. However, the firms with the lowest accruals have declining sales and earnings over the period prior to portfolio formation. Earnings relative to assets and the gross margin hit their lowpoints in the portfolio formation year, so this is not a particularly opportune moment to store earnings through accruals. Rather, it may be the case that these firms reduce their earnings in the formation year when they see light at the end of the tunnel and signs that their fortunes will rebound in the near future. Cutting earnings even more enables them to show subsequent improvements in the bottom line numbers that the market does not seem to anticipate fully at the portfolio formation year.

3 Understanding the predictive power of accruals

3.1 The components of accruals

Relating total accruals to future stock returns provides limited opportunities to distinguish between the competing explanations for accruals' predictive power. One way to focus our tests is to look at the components of accruals (see also Thomas and Zhang (2002)). For example, some accounts may be more susceptible to managerial manipulation than others, so the relation between accruals and subsequent returns should be more pronounced for these items. If, on the other hand, underreaction to a decline in sales growth is driving the subsequent stock price changes, then the effects of the slowdown should be relatively uniform across the components of accruals. Importantly, in the case of an increase in accounts payable the manipulation hypothesis and the underreaction hypothesis yield very different predictions. On the one hand, an increase

in accounts payable may be an early warning sign of deterioration in cash flow and hence signals poor stock price performance in the future. Under the conventional belief that changes in accruals connote manipulation, however, a rise in accounts payable lowers current accruals and is perceived as transferring current earnings to the future. Insofar as investors interpret this as a negative shock to current earnings and do not recognize the impact on future earnings, the future stock price performance should be favorable as future earnings recover.

Table 4 reports returns on portfolios sorted by each component of accruals. With the exception of changes in other current liabilities, each component reliably predicts raw and abnormal returns at least over the first year following portfolio formation. The accrual component that is associated with the largest spread in returns over the post-formation period is changes in inventory (panel B). The mean raw return over the first post-formation year for the portfolio ranked lowest by ΔINV is 19 percent, compared to 9.5 percent for the highest-ranked portfolio, for a spread of 9.53 percent. The spread in average abnormal returns is 7.2 percent. These are comparable to the spreads associated with total accruals: in Table 3, the corresponding spreads are 8.8 percent and 7.4 percent for raw and abnormal returns, respectively. Thomas and Zhang (2002) also find a strong association between inventory changes and future returns.

ΔINV may signal unanticipated changes in a firm's future prospects. For example, in many macroeconomic models, changes in aggregate inventory are a negative leading indicator of future economic conditions. On the other hand, it is possible to manipulate earnings through ΔINV. For example, managers may not be fully writing off obsolete items in their inventories, or they may be allocating more overhead expenses to inventory than to cost of goods sold. Furthermore, such manipulation of inventory has a dollar-for-dollar impact on the cost of goods sold, and thus flows directly through to bottom line income.

In the first year after portfolio formation, changes in accounts receivable (panel A) are associated with a mean spread in raw returns of 5.4 percent, or 3.1 percent for abnormal returns. Accountants and regulators suggest that overstating revenues, or recognizing revenues prematurely, are common ways to manipulate earnings. SEC (2003) finds that in the cases where there was enforcement action, improper revenue recognition, which in turn leads to elevated accounts receivable, is the most commonly-used method for inflating earnings. It is also possible that the increase in accounts receivable arises because as sales growth undergoes

a relative flattening, firms are compelled to offer more generous credit terms in an effort to maintain revenue growth. If changes in business conditions are driving accruals, however, the effect should generally be uniform across the different components. In this respect, the differences between the return spreads associated with ΔINV and ΔAR, even though their cross-sectional dispersions are roughly the same (Table 1), is not consistent with the under-reaction hypothesis.

Changes in accounts payable (panel D) provide a sharp means to discriminate between these two hypotheses. In panel D, the sort by ΔAP indicates that the extreme decile portfolios' future performance does not mesh with the conventional notion that identifies accruals with managerial manipulation. Specifically, over the post-formation period it is the highest ranked decile portfolio that has relatively poor returns while the lowest ranked portfolio does not underperform. The top decile portfolio's abnormal return is -3.1 percent in the first post-formation year while the bottom decile portfolio's abnormal return is 2.6 percent. Averaging over the three post-formation years, the average abnormal returns for the top and bottom decile portfolios are -2 percent and 0.7 percent per year, respectively. The positive spread in returns between the bottom and top decile portfolios ranked by changes in accounts payable is consistent with investors being slow to impound changing business conditions into stock prices. For instance, when a company's business prospects cool, accounts payable may rise because the firm may not be so cash-rich as before.

In summary, inventory changes are the dominant component of accruals for predicting returns. Changes in accounts receivable and accounts payable also have some predictive power. Based on the evidence from the accrual components, the verdict on which hypothesis best explains the effect of accruals is, however, split. On the one hand, the non-uniform impact of changes in inventory and accounts receivable suggests that managers are manipulating earnings. On the other hand, the negative association between accounts payable changes and future returns is hard to square with the conventional presumption that accruals reflect only managerial manipulation of earnings.

3.2 The role of nondiscretionary and discretionary accruals

As business conditions such as sales vary across firms, so do working capital requirements and thereby the level of accruals. Controlling for the effects of business conditions may help tease out more clearly the

role of managerial discretion in using accruals to manipulate earnings. In this section we implement this idea by decomposing the level of accruals into nondiscretionary and discretionary components. The nondiscretionary component captures the impact of business conditions while the discretionary portion reflects managerial choices. Our strategy parallels other approaches in the accounting literature for distinguishing between non-discretionary and discretionary accruals (see Jones (1991)).

Few firms have sufficiently long time series to permit reliable estimation of a regression model to extract the discretionary portion of accruals. Instead we rely on a parsimonious model. First we relate the level of each component of working capital for a firm to its current sales. For example in the case of inventory, I_{it}, and sales, $Sales_{it}$, for firm i in year t, we define

$$E_t(I_{it}) = \frac{\sum_{k=1}^{5} I_{it-k}}{\sum_{k=1}^{5} Sales_{it-k}} Sales_{it}. \tag{2}$$

The nondiscretionary change in inventory, NDI_{it}, is then given by

$$NDI_{it} = E_t(I_{it}) - I_{it-1}, \tag{3}$$

while the discretionary change in inventory, DI_{it} is

$$DI_{it} = I_{it} - E_t(I_{it}). \tag{4}$$

Equation (2) models the level of each underlying working capital account, such as inventory, as a relatively stable proportion of firm sales. The model reflects the idea that working capital requirements are closely related to sales. To smooth out transitory fluctuations in this relation we estimate the proportion as the ratio of a moving average of the past five years of the item to a moving average of the past five years of sales. The discretionary component of the change in a working capital item is the difference between the actual level and its fitted level from equation (2).

Stocks are sorted into decile portfolios by discretionary accruals in panel A, and by nondiscretionary accruals in panel B of Table 5. In terms of the return spreads between the lowest- and highest-ranked decile portfolios, the sort by discretionary accruals comes close to matching the performance of the sort by total accruals. In panel A, the return spread between the extreme deciles is 7.8 percent in raw returns (7.4 percent in abnormal returns) over the first post-formation year. The spreads corresponding to the classification by

total accruals are 8.8 and 7.4 percent for raw and abnormal returns, respectively. Very large changes in working capital in any year are likely to reflect instances of managerial discretion, so the extreme portfolios in the sort by accruals should also do well in detecting the impact of manipulation. What is more telling is how well discretionary accruals spread out the returns for the other, intermediate, portfolios. For example, the second and ninth decile portfolios have a spread in abnormal returns over the first subsequent year of 5.6 percent based on discretionary accruals, compared to 2.5 percent based on total accruals.[11]

Guay, Kothari and Watts (1996) argue that the accrual decomposition methods popularly used in the accounting literature do poorly in separating the discretionary and nondiscretionary elements. Any misspecification in the decomposition introduces measurement errors in each estimated component. As a result, the ability of estimated discretionary accruals to predict returns is understated. Further, to the extent that a part of measured nondiscretionary accruals is contaminated by the discretionary component, our results likely overstate the ability of nondiscretionary accruals to predict returns.

The extrapolation hypothesis posits that firms with high accruals represent instances of overvaluation because of investors' cognitive biases. In particular these firms have enjoyed high sales growth in the past, and investors extrapolate past growth to form exaggerated expectations about future growth. Our decomposition procedure assumes that nondiscretionary accruals grow proportionally with sales. However, panel B indicates that there is essentially no association between nondiscretionary accruals and future returns. Accordingly, this evidence is not consistent with the extrapolation hypothesis.[12]

Table 6 examines the predictive power of individual components of accruals, in terms of their discretionary and nondiscretionary values. For the sake of brevity we report differences in the returns (raw and abnormal) between the extreme decile portfolios. Since Table 4 indicates that changes in three accounts

[11]The appropriate decomposition of accruals into discretionary and nondiscretionary components is a controversial issue. Dechow, Sloan and Sweeney (1995) evaluate different procedures for decomposing accruals and report results in favor of the ability of the Jones (1991) model to detect earnings management. Xie (2001) uses the Jones (1991) model to decompose accruals and finds results similar to ours. In additional, unreported, tests we find that, compared to the Jones decomposition, our approach based on past sales generally yields larger spreads in future returns and a more monotonic pattern across the decile portfolios' returns.

[12]In a related context, Doukas, Kim and Pantzalis (2002) examine analysts' earnings forecasts and argue that the extrapolation hypothesis does not explain the relatively low returns on growth stocks.

— inventory, accounts receivable and accounts payable — account for the bulk of the predictive power of accruals, we limit attention to these items.

The results from Table 6 echo those in the earlier tables. For instance, the discretionary component of inventory changes is associated with the largest spreads in future abnormal returns. The difference in the first post-formation year between the extreme decile portfolios is 9.1 percent in terms of abnormal returns. Discretionary increases in accounts payable are associated with lower future returns, counter to the managerial manipulation hypothesis, but in line with the market underreaction hypothesis. For both inventory and accounts payable, the nondiscretionary portion induces almost no difference in returns.

Information on that part of accruals which is predictable from past sales, or nondiscretionary accruals, would appear to be easily available to sophisticated investors and analysts. Accordingly it would stretch credulity if returns are systematically related to nondiscretionary accruals. In this respect our finding that future returns are related only to discretionary accruals provides some reassurance that the accrual effect is not entirely spurious.

3.3 The behavior of special items

High accruals may be a reflection of managers' deliberate attempts to manipulate accounting numbers in order to avoid disappointing analysts and investors. For example, managers can inflate earnings by overstating the ending level of inventory and thus underestimating the cost of goods sold. While this results in higher earnings, the cash flow situation does not improve because the increased inventory raises accruals. Of course, inflating earnings in one period has consequences for reported earnings in the future. In the case of overstating inventory, one potential impact is an increase in writedowns of inventory in subsequent years. Such writedowns will show up at least in part as a reversal of future accruals: after the original overstatement of inventory which increases accruals, future years' accruals become lower. Part of the high previous accruals may also be unwound as a special item on the income statement. Special items reflect unusual charges to a firm's income, and include writedowns of inventory or receivables, as well as restructuring or reorganization costs. In this section we track the behavior of accruals and special items in the years following portfolio formation, in order to pick up the traces of any manipulation of earnings in previous years.

Panel A of Table 7 reports the level of special items as a percent of average total assets, for firms sorted by accruals at the end of April each year. Not all firms report special items, so we form five portfolios to ensure that each group contains a sufficiently large number of firms. We track special items over each of the three years up to the portfolio formation date, and the three following years.

The level of special items is on average negative. The reason for this finding may be that analysts and investors generally focus on earnings from continuing operations. When earnings are lackluster, managers may try to put the best face on the situation. They may interpret the earnings disappointment as a one-time event, and count it as a special item in order to shield net income from continuing operations. What is especially striking from our standpoint is the difference in how special items behave over the years before and after portfolio formation. For the top quintile of firms ranked by accruals, special items experience the largest change over the three years following portfolio formation, compared to the three prior years. Their special items are on average -0.14 percent of total assets before portfolio formation, and jump to -0.56 percent on average in the post-formation period. The corresponding averages for the quintile portfolio that is ranked lowest by accruals are -0.43 percent (pre-formation) and -0.40 percent (post-formation). The large jump in income-decreasing special items following a year when accruals are especially high, may reflect the effects of managerial manipulation of earnings in prior years being reversed over time.[13]

Although income-reducing special items quickly rise after the portfolio formation year for the stocks with high accruals, the post-formation reversal in accruals occurs over a relatively longer period. In panel B of Table 7, total accruals remain positive for the top decile portfolio in the first two post-formation years before turning negative in the third year. Discretionary accruals display a similar pattern, dropping to -1.83 percent of assets three years after portfolio formation (panel C). In short, special items pick up more immediately the unwinding in past accruals. This may reflect the tendency of investors and analysts to discount special items as transitory charges and focus instead on income from continuing operations. In this case managers may be more willing to let the effects of high past accruals flow through special items, and shield

[13] As sales growth and business conditions slacken, the special item charges may reflect adjustments in firm policy in subsequent years. For instance, if demand falls below expectation, managers may choose to write down inventories to more appropriate levels. It is not obvious, however, why the adjustment to slower business conditions should continue to be stretched out several years after the year when accruals signal a turning point.

income for as long as possible.

Echoing our results from the previous tables, the behavior of the bottom decile portfolio is not symmetric with the behavior of the top decile portfolio. In the case of stocks with the lowest accruals as of the portfolio formation year, total and discretionary accruals remain relatively low in the following years. The prolonged subsequent adjustment in accruals of these firms may be a hint that these cases are less likely to represent instances of earnings manipulation, compared to firms where accruals are high.

4 Cross-sectional regressions

4.1 Accrual regressions

As another way to determine the impact of the individual accrual items we carry out monthly cross-sectional regressions. Table 8 reports the time-series averages of the regression slopes together with their 't'-statistics. The dependent variable in each regression is the annual abnormal return for individual stocks. Panel A presents results based on raw accruals, and panel B gives results for discretionary accruals.

Regression (1) in panel A confirms a negative and significant relation between raw accruals and future abnormal returns. The slope coefficient for accruals averages -0.2627 (with a 't'-statistic of -4.14). In the univariate regressions for the individual accrual items the slope coefficients are also negative and significant. When all three accrual components — changes in accounts receivable, inventories and accounts payable — are included (regression (5) in Table 8) the item with the largest predictive power is inventory changes. The average slope for ΔINV is -0.2661, and it is almost as large as the slope for accruals by itself in the first regression. Notably, the average slope for changes in accounts payable is always negative in panel A, although it is not statistically significant in regression (5).

The results for discretionary accruals in panel B generally tell a similar story. For example the average slope for discretionary accruals is -0.2419 (with a 't'-statistic of -5.20) in regression (6), and the average slope for discretionary changes in inventory is -0.3259 (with a 't'-statistic of -4.55) in regression (10).

4.2 Portfolio results based on return prediction models

Regardless of why items like changes in inventory or accounts payable predict returns, there is no reason to think that a catchall measure like total accruals best summarizes the information in these predictors. Parsimony compels us to look at a short list of variables, but the specific linear combination of these variables defined as accruals may not necessarily be the most informative indicator of manipulation or future business conditions. Indeed, the negative association between accounts payable and future returns strengthens the suspicion that it may be possible to improve on the accrual measure. In particular slopes from regression models such as those in Table 8 can be interpreted as weights for constructing alternative indicators. In this section we see if measures constructed in this fashion turn out to be more informative than considering accruals only. We do this by implementing a trading strategy based on predicted returns from the models, and examining whether the predictions from the models spread out returns more than do accruals.

We consider four return prediction models. In model 1, the predictor is accruals, so all the individual accrual components (depreciation and changes in: inventories, accounts receivable, accounts payable, other current assets, and other current liabilities) enter the regression. Model 2 uses the discretionary components of these same items, as given by equations (2) and (4). Model 3 uses as predictors changes in: inventories, accounts receivable and accounts payable. The discretionary components of these three variables serve as the predictors in model 4. At each year-end we take a rolling average of the estimated coefficients from all the prior years' cross-sectional regressions and use these as the parameters in the prediction model. Based on the predicted return from the model, stocks are ranked and grouped into one of ten portfolios. Buy-and-hold raw returns and abnormal returns for the ten equally-weighted portfolios are then calculated over the subsequent year.[14]

Table 9 reports the mean returns for the portfolios. Recall that the sort by accruals generates a return differential of 8.8 percent in raw returns and 7.4 percent in abnormal returns between the extreme deciles over the first subsequent year. This performance is roughly matched by all the models in Table 9. For

[14]To start the trading rule at the beginning of the sample period, we use the average coefficients from the first five years' cross-sectional regressions to generate predicted returns. Returns earned from the trading strategies are calculated from the sixth year onward. This ensures that there is no look-ahead bias.

example, the predictive model (1), which is based on all the individual accrual items, yields a spread of 8.3 percent for raw returns, and 7 percent for abnormal returns between the extreme deciles. Economic intuition suggests that the nondiscretionary portion of accruals should not help to predict returns, so a strategy that excludes this component should do better. Model (2), which is based on the discretionary portion of the individual accrual items, confirms this logic. The spread in raw returns (abnormal returns) is 8.9 percent (8.8 percent).

Compared to a trading rule based on total accruals, rules based on models (3) and (4), which use only three accrual items — changes in inventory, accounts receivable and accounts payable — hold up well. The difference, however, is that models (3) and (4) allow for a negative predictive relation between accounts payable changes and returns. In particular, the investment strategy based on model 4 yields the largest return spread (9.7 percent in raw and abnormal returns). This model predicts returns based on discretionary values of ΔINV, ΔAR, and ΔAP.

5 Robustness checks

5.1 The accrual effect within industries

Working capital requirements vary across lines of business, so in a line of activity where inventories and receivables represent a small fraction of total assets, accruals (excluding depreciation) are likely to be relatively low. The information contained in accruals about future returns is likely to be meager in such cases. To bring out more clearly the predictive power of accruals, we examine return spreads associated with accruals across firms within the same industry, so they are relatively homogeneous. In particular, we apply the same sort procedure as in Table 3 to form four portfolios within each of the industry groupings defined by Fama and French (1997). The spread in abnormal returns between the bottom and top quartile portfolios for each of the three years after portfolio formation is reported in Table 10, along with the simple mean and

't'-statistic over all industries.[15]

The abnormal return spread in the first post-formation year averages 5 percent across all industries (with a 't'-statistic of 6.86) and is positive in 29 out of 32 cases, so the accrual effect is robust. Notably, the spread tends to be larger in industries where working capital is high such as Toys (Recreational Products), and Construction, and is smaller in lines of business with low working capital levels such as Meals (Restaurants, Hotel and Motel), Utilities and Transportation.

The results in Table 10 also provide another means of discriminating between the competing explanations for the accrual effect. In the case of cash-based businesses where earnings roughly match cash flows, there is less scope for managers to distort reported income. Under the manipulation hypothesis, therefore, the predictive power of accruals should vary across industries depending on the levels of working capital. On the other hand, if unanticipated changes in business conditions are the force driving both accruals and subsequent returns under the underreaction hypothesis, the effect of accruals should be relatively uniform across industries. The dominant components of working capital are inventory and accounts receivable (see Table 1). In Table 10, the rank correlation between inventory plus accounts receivable (relative to average total assets) and the abnormal return spread $AR1$ is 0.27. The rough correspondence between the size of the return spread and the level of working capital thus provides support for the manipulation hypothesis.

5.2 Evidence from U.K. stocks

All the existing studies which document the association between accruals and future stock returns are based on evidence from the U.S. This raises the question whether the accrual effect is specific to U.S. stocks. If the evidence does not generalize to other markets with similar accounting conventions, the suspicion arises that the association is spurious and may have no economic rationale. Accordingly, as another robustness check we explore whether accruals predict returns in a foreign market. In particular, accounting standards in the U.K. are similar to those in the U.S., and (as of the time of writing) the U.K. equity market is the

[15] We require the average number of firms in an industry over the sample period to be at least 20. Also, the number of years where an industry contains fewer than 20 firms cannot be over 5. Firm-year observations that do not meet these criteria are assigned to the 'Other' category in the table.

second-largest in the world. From the standpoint of the potential motivation to manipulate earnings, it is also noteworthy that generally speaking in the U.K. management compensation schemes (as well as the behavior of research analysts and investors) more closely resemble those in the U.S. than do other countries.

In Table 11 we replicate our analysis using data on U.K. stocks. The sample comprises all domestic, primary, non-financial U.K. stocks which are available in the Xpressfeed database, with data on accruals and returns. Portfolios are formed at the end of April each year from 1991 to 2000, assuming a four-month reporting delay.

The results for the U.K. data confirm an association between accruals and future returns. Further, the sort by accruals (panel A) generates larger spreads in returns than the U.S. results. The difference in raw returns between the lowest- and highest-ranked decile groups is 13.5 percent in the year following portfolio formation, and the corresponding difference in excess returns is 10.8 percent. When we look at the components of accruals, the evidence generally echoes that in the U.S. The major contribution to the predictive power of accruals comes from the inventory component. The sort by inventory changes (panel C) produces spreads in raw and excess returns (about 8 percent) that are close to the results for total accruals. In short, our evidence from the second-largest equity market, which is relatively free from data-snooping biases, confirms the predictive power of accruals for returns, and also highlights the importance of the inventory component.

6 Summary and conclusions

A firm's "bottom-line" earnings number has traditionally been the focus of analysts, investors and researchers, while other financial statement items have generally been overlooked. These other items may provide information about the quality of a firm's earnings and possibly have rich predictive power for stock returns. As a starting point to call attention to the potential relevance of earnings quality, this paper borrows from the empirical accounting literature. In particular, there is a reliable, negative association between accruals (the difference between accounting earnings and cash flows) and future stock returns. Importantly, the behavior of accruals throws a different light on the connection between earnings surprises and stock returns. This association between surprises and returns has been extensively documented in the empirical finance

literature, and serves as the basis for many widely-used investment strategies. What is less well documented in this literature, however, is that the relation must be qualified by the behavior of accruals. Increases in earnings that are accompanied by high accruals are associated with sub-par returns. In this regard, accruals may provide information about the quality of earnings.

Our finding that accruals have predictive power for returns is not new (see Sloan (1996), Collins and Hribar (2000,2002), Xie (2001)). However, the bulk of the previous research on the informativeness of accruals is generally silent as to the economic basis for its association with future returns (Thomas and Zhang (2002) is a notable exception). This paper explores three explanations for why accruals predict stock returns. Under the conventional interpretation, high accruals smell of earnings manipulation by managers. On the other hand accruals may serve as leading indicators of changes in a firm's prospects, without any manipulation by managers. The market tends to underreact to these indicators, however, so returns lag accruals. Accruals may also predict returns if the market views accruals as reflecting past growth, and extrapolates such growth to form over-optimistic expectations about future performance.

We contribute new evidence that helps to discriminate between these hypotheses. We examine operating performance and special items around years when accruals rise, develop an original and relatively robust procedure for disentangling the discretionary and non-discretionary components of accruals, formulate multivariate return prediction regressions based on accrual components, and provide tests based on industries and U.K. data.

The bulk of the evidence fits the hypothesis that accruals reflect managers' manipulation of earnings. In particular, we find that a large increase in accruals marks a sharp turning point in the fortunes of a company. A firm that looked dazzling (with high stock returns and high earnings growth) in the years preceding the rise in accruals suddenly appears to lose steam and its growth reverts to a more normal rate. Earnings in subsequent years, while staying positive, tumble along with stock prices. Intriguingly, in the year when accruals are high and possibly signal that the company's past growth has faded, earnings show no weakness but continue to grow rapidly. These patterns suggest that firms with high accruals already face symptoms of a cooling in their growth, but they use creative accounting to delay reporting the bad news. In subseqent years, special items also become more negative, suggesting that the effects of the prior years' manipulation is

being corrected. The fact that the effects are most pronounced for firms whose accruals are high, rather than firms with low accruals, ia also consistent with the manipulation hypothesis. There are stronger pressures on managers to inflate earnings to maintain favorable investor sentiment, compared to the incentives to defer current earnings to the future.

On the whole, several other pieces of evidence suggest that the effect of accruals is not solely driven either by under-reaction to changes in business conditions, or by extrapolative expectations. For example, if changes in business conditions were the sole force driving accruals and investors under-react to these changes, the effects of accruals should be roughly uniform across accrual components and across industries. Instead, the two main components of accruals, changes in inventory and accounts receivable, have different degrees of predictive power, even though they share the same amount of cross-sectional variability. Furthermore, the accrual effect varies across industries and tends to be positively associated with industry levels of non-cash working capital. The manipulation hypothesis, however, can account for these results. When we decompose accruals into discretionary and nondiscretionary components, we find that the discretionary component is the main contributor to the predictability in returns. The accounting literature generally tends to regard discretionary accruals as being an indicator of managers' attempts to manipulate earnings. Nondiscretionary accruals, on the other hand, do not help to predict returns, contrary to the hypothesis that high-accrual firms tend to be overvalued because of exaggerated expectations about future growth.

Regardless of the sources of accruals' predictive power, a simple catchall measure such as accruals may not be the most informative indicator. Accordingly we develop a model based on the components of accruals to predict future returns. This model does better in spreading out returns than the simple accrual measure. The bulk of the predictive power of accruals stems from changes in inventory and changes in accounts receivable.

Accruals continue to predict returns even within homogeneous groups of firms which belong to the same industry. We also use a dataset on U.K. firms that is not subject to data-snooping biases in order to provide new evidence on the effect of accruals. The results from both the U.S. and U.K. data suggest that a small number of accrual items including changes in inventory, which seem to contain information about the quality of earnings, help to predict the cross-section of future returns.

References

Abarbanell, Jeffrey, and Brian Bushee, 1998, Abnormal returns to a fundamental analysis strategy, *The Accounting Review* 73, 19–45.

Abarbanell, Jeffrey, and Reuven Lehavy, 2000, Biased forecasts or biased earnings: The role of earnings management in explaining apparent optimism and inefficiency in analysts' earnings forecasts, working paper, University of North Carolina.

Barberis, Nicholas, and Richard Thaler, 2002, A survey of behavioral finance, NBER working paper 9222.

Basu, Sanjoy, 1977, Investment performance of common stocks in relation to their price earnings ratios: A test of the efficient market hypothesis, *Journal of Financial Economics* 32, 663–682.

Bernard, Victor L., and Thomas L. Stober, 1989, The nature and amount of information in cash flows and accruals, *The Accounting Review* 64, 624–652.

Bernard, Victor L., and Jacob K. Thomas, 1989, Post-earnings-announcement drift: Delayed price response or risk premium?, *Journal of Accounting Research (Supplement)* 27, 1–36.

Bowen, Robert M., David Burgstahler, and Lane A. Daley, 1987, The incremental information content of accruals versus cash flow, *The Accounting Review* 62, 723–747.

Chan, Louis K. C., Yasushi Hamao, and Josef Lakonishok, Fundamentals and stock returns in Japan, *Journal of Finance* 46, 1739–1764.

Chan, Louis K. C., Narasimhan Jegadeesh, and Josef Lakonishok, 1996, Momentum strategies, *Journal of Finance* 51, 1681–1713.

Chan, Louis K. C., Jason Karceski, and Josef Lakonishok, 2003a, The level and persistence of growth rates, *Journal of Finance* 58, 643–684.

Chan, Louis K. C., Jason Karceski, and Josef Lakonishok, 2003b, Analysts' conflict of interest and biases in earnings forecasts, working paper, University of Illinois at Urbana-Champaign.

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

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

De Bondt, Werner F. M., and Richard H. Thaler, 1990, Do security analysts overreact?, *American Economic Review* 80, 52–57.

Dechow, Patricia, Richard Sloan, and Amy Sweeney, 1995, Detecting earnings management, *The Accounting Review* 70, 3–42.

Dechow, Patricia, Richard Sloan, and Amy Sweeney, 1996, Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC, *Contemporary Accounting Research* 13, 1–36.

Degeorge, François, Jayendu Patel, and Richard Zeckhauser, 1999, Earnings management to exceed thresholds, *Journal of Business* 72, 1–33.

Doukas, John A., Chansog (Francis) Kim and Christos Pantzalis, 2002, A test of the errors-in-expectations explanation of the value/glamour stock returns performance: Evidence from analysts' forecasts, *Journal of Finance* 57, 2143-2165.

Edwards, William, 1968, Conservatism in human information processing, in B. Kleinmuntz, (ed.), *Formal Representation in Human Judgment*, New York: John Wiley and Sons.

Fama, Eugene F., and Kenneth R. French, 1992, The cross-section of expected stock returns, *Journal of Finance* 46, 427–466.

Fama, Eugene F., and Kenneth R. French, 1997, Industry costs of equity, *Journal of Financial Economics* 43, 153–193.

Foster, George, Chris Olsen, and Terry Shevlin, 1984, Earnings releases, anomalies, and the behavior of security returns, *The Accounting Review* 59, 574–603.

Friedland, John M., 1994, Accounting choices of issuers of initial public offerings, *Contemporary Account-*

ing Research 11, 1–31.

Guay, Wayne, S. P. Kothari, and Ross Watts, 1996, A market-based evaluation of discretionary accrual models, *Journal of Accounting Research (Supplement)* 34, 83–115.

Hirshleifer, David, 2001, Investor psychology and asset pricing, *Journal of Finance* 56, 1533–1597.

Houge, Todd, and Tim Loughran, 2000, Cash flow is king: Cognitive errors by investors, *Journal of Psychology and Financial Markets* 1, 161–175.

Hribar, Paul, 2000, The market pricing of components of accruals, working paper, Cornell University.

Jegadeesh, Narasimhan, and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48, 65–91.

Jones, Jennifer J., 1991, Earnings management during import relief investigations, *Journal of Accounting Research* 29, 193–228.

La Porta, Rafael, 1996, Expectations and the cross-section of stock returns, *Journal of Finance* 51, 1715–1742.

La Porta, Rafael, Josef Lakonishok, Andrei Shleifer, and Robert Vishny, 1997, Good news for value stocks: Further evidence on market efficiency, *Journal of Finance* 52, 859–874.

Lakonishok, Josef, Andrei Shleifer, and Robert Vishny, 1994, Contrarian investment, extrapolation, and risk, *Journal of Finance* 49, 1541–1578.

Latane, Henry A., and Charles P. Jones, 1979, Standardized unexpected earnings 1971–1977, *Journal of Finance* 34, 717–724.

Piotroski,Joseph D., 2000, Value investing: The use of historical financial statement information to separate winners from losers, *Journal of Accounting Research (Supplement)* 38, 1–41.

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

Securities and Exchange Commission, 2003, Report pursuant to section 704 of the Sarbanes-Oxley Act of 2002.

Shleifer, Andrei, 2000, Inefficient markets: An introduction to behavioral finance, Oxford University Press.

Sloan, Richard G., 1996, Do stock prices fully reflect information in accruals and cash flows about future earnings?, *The Accounting Review* 71, 289–315.

Subramanyam, K. R., 1996, The pricing of discretionary accruals, *Journal of Accounting and Economics* 22, 249–281.

Teoh, Siew Hong, Ivo Welch, and T. J. Wong, 1998a, Earnings management and the long-run performance of initial public offerings, *Journal of Finance* 53, 1935–1974.

Teoh, Siew Hong, Ivo Welch, and T. J. Wong, 1998b, Earnings management and the underperformance of seasoned equity offerings, *Journal of Financial Economics* 50, 63–99.

Thomas, Jacob K., and Huai Zhang, 2002, Inventory changes and future returns, *Review of Accounting Studies* 7, 163–187.

Wilson, G. Peter, 1987, The incremental information content of the accrual and funds components of earnings after controlling for earnings, *The Accounting Review* 62, 293–322.

Xie, Hong, 2001, The mispricing of abnormal accruals, *The Accounting Review* 76, 357–373.

Table I
Summary statistics

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. Variables for each firm are measured as of the end of April each year from 1971 to 1995, assuming a reporting delay of four months from the end of the fiscal year. Panel A provides summary statistics for the components of working capital (each item is divided by average total firm assets). Panel B provides statistics for: ΔCA the change in non-cash current assets; ΔCL the change in current liabilities excluding short-term debt and taxes payable; DEP depreciation and amortization; ΔAR, change in accounts receivable; ΔINV, change in inventories; ΔOCA, change in other current assets; ΔAP, change in accounts payable; ΔOCL, change in other current liabilities. Accruals is defined as ($\Delta CA - \Delta CL - DEP$); earnings is measured as operating income after depreciation; cash flow is earnings minus accruals. All items are divided by average total firm assets.

Panel A: Components of working capital (relative to average total assets)

Variable	Mean	Standard deviation	25-th percentile	Median	75-th percentile
Current assets	0.459	0.238	0.269	0.471	0.631
Current liabilities	0.191	0.110	0.117	0.171	0.240
Accounts receivable	0.217	0.140	0.115	0.204	0.290
Inventory	0.218	0.170	0.064	0.203	0.331
Other current assets	0.024	0.028	0.008	0.016	0.030
Accounts payable	0.103	0.082	0.050	0.081	0.128
Other current liabilities	0.089	0.069	0.044	0.073	0.112

Panel B: Earnings, cash flow and accruals (relative to average total assets)

Variable	Mean	Standard deviation	25-th percentile	Median	75-th percentile
ΔCA	0.060	0.121	0.001	0.038	0.100
ΔCL	0.027	0.064	-0.001	0.018	0.047
DEP	0.045	0.028	0.027	0.039	0.055
ΔAR	0.030	0.073	-0.001	0.017	0.050
ΔINV	0.026	0.071	-0.002	0.010	0.046
ΔOCA	0.004	0.023	-0.001	0.002	0.007
ΔAP	0.014	0.045	-0.004	0.008	0.026
ΔOCL	0.013	0.038	-0.001	0.008	0.022
Accruals	-0.012	0.102	-0.064	-0.024	0.028
Earnings	0.121	0.126	0.070	0.117	0.176
Cash flow	0.133	0.141	0.075	0.137	0.202

Table 2
Returns for portfolios sorted by earnings change and accruals

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. Stocks are ranked at the end of April each year into one of five groups by accruals (relative to average total assets) and independently by earnings change relative to average total assets. Earnings change is the difference between earnings for the most recently ended fiscal year (assuming a four-month reporting delay) and the prior year's earnings. The intersection of the two sorts gives twenty five portfolios. Equally-weighted buy-and-hold raw and abnormal returns on each portfolio in the first year following portfolio formation are reported in panels A and B respectively. A stock's abnormal return is its return in excess of a control portfolio matched by size and book-to-market.

Panel A: Raw returns

		Accruals relative to average total assets					
		1(Low)	2	3	4	5(High)	(1)-(5)
Earnings change relative to average total assets	1(Low)	0.158	0.152	0.138	0.101	0.096	0.062
	2	0.193	0.184	0.150	0.142	0.116	0.078
	3	0.213	0.184	0.166	0.174	0.117	0.096
	4	0.215	0.185	0.162	0.171	0.139	0.076
	5 (High)	0.170	0.170	0.164	0.153	0.120	0.050
	(5)-(1)	0.012	0.019	0.027	0.052	0.024	

Panel B: Abnormal returns

		Accruals relative to average total assets					
		1(Low)	2	3	4	5(High)	(1)-(5)
Earnings change relative to average total assets	1(Low)	-0.004	-0.009	-0.018	-0.054	-0.051	0.047
	2	0.034	0.026	-0.010	-0.015	-0.037	0.071
	3	0.056	0.028	0.011	0.018	-0.027	0.083
	4	0.066	0.032	0.010	0.020	-0.008	0.073
	5 (High)	0.026	0.035	0.021	0.005	-0.012	0.038
	(5)-(1)	0.030	0.045	0.038	0.059	0.039	

Accruals are defined as $\Delta CA - \Delta CL - DEP$ where ΔCA is the change in non-cash current assets; ΔCL the change in current liabilities excluding short-term debt and taxes payable; DEP is depreciation and amortization. Earnings is operating income after depreciation.

Table 3
Characteristics and returns for portfolios sorted by accruals

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks are ranked by accruals relative to average total assets and assigned to one of ten equally-weighted portfolios (assuming a reporting delay of four months from the end of the fiscal year). Average values of accruals, earnings and characteristics for each portfolio are presented in panels A and B. Average annual buy-and-hold returns are presented in panel C for each year from three years prior to portfolio formation to three years after formation, along with the difference between the bottom and top deciles and the 't'-statistic for the mean difference. Panel D reports average annual returns in excess of the return on control portfolios matched by size and book-to-market.

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)
Panel A: Accruals and earnings										
Accruals	-0.162	-0.088	-0.063	-0.046	-0.030	-0.015	0.003	0.027	0.067	0.189
Cash flow	0.233	0.187	0.172	0.155	0.144	0.132	0.125	0.111	0.084	-0.013
Earnings	0.071	0.100	0.109	0.110	0.114	0.117	0.128	0.138	0.151	0.176
ΔCA	-0.056	-0.004	0.010	0.018	0.029	0.043	0.060	0.087	0.134	0.277
ΔCL	0.037	0.024	0.020	0.017	0.018	0.019	0.020	0.025	0.033	0.058
DEP	0.070	0.060	0.052	0.047	0.042	0.039	0.037	0.035	0.034	0.030
ΔAR	-0.024	0.001	0.007	0.011	0.015	0.021	0.029	0.041	0.063	0.130
ΔINV	-0.029	-0.006	0.000	0.005	0.011	0.018	0.027	0.041	0.063	0.134
ΔOCA	-0.003	0.001	0.002	0.002	0.003	0.003	0.005	0.006	0.008	0.013
ΔAP	0.012	0.010	0.009	0.008	0.009	0.010	0.011	0.014	0.019	0.039
ΔOCL	0.025	0.014	0.011	0.009	0.009	0.009	0.009	0.011	0.014	0.019
Panel B: Firm characteristics										
Log Size	4.12	4.63	4.86	4.88	4.95	4.83	4.64	4.43	4.19	3.88
Book-to-market	0.79	0.83	0.85	0.85	0.86	0.84	0.80	0.76	0.69	0.58
Average annual growth in sales over prior 3 years	0.072	0.076	0.088	0.093	0.099	0.104	0.108	0.126	0.157	0.228

Table 3 contd.

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	1-10	't'-stat
Panel C: Raw returns												
Three years before	0.113	0.140	0.151	0.159	0.169	0.185	0.191	0.224	0.281	0.376	-0.263	-8.34
Two years before	0.130	0.141	0.151	0.147	0.163	0.164	0.199	0.232	0.273	0.419	-0.289	-6.59
One year before	0.304	0.251	0.229	0.210	0.201	0.198	0.199	0.207	0.220	0.281	0.024	0.97
One year after	0.178	0.178	0.174	0.170	0.163	0.157	0.157	0.150	0.140	0.090	0.088	3.79
Two years after	0.157	0.165	0.177	0.179	0.170	0.155	0.156	0.157	0.137	0.097	0.060	3.76
Three years after	0.189	0.184	0.178	0.184	0.174	0.182	0.183	0.168	0.175	0.132	0.057	3.08
Panel D: Abnormal returns												
Three years before	-0.028	-0.004	0.010	0.014	0.024	0.041	0.049	0.084	0.142	0.243	-0.271	-9.20
Two years before	-0.002	0.003	0.013	0.008	0.024	0.026	0.057	0.093	0.139	0.294	-0.296	-7.21
One year before	0.150	0.094	0.072	0.055	0.042	0.044	0.048	0.057	0.072	0.143	0.007	0.35
One year after	0.026	0.024	0.023	0.017	0.009	0.007	0.003	-0.001	-0.001	-0.047	0.074	3.83
Two years after	0.004	0.009	0.018	0.019	0.010	0.001	0.006	0.006	-0.009	-0.041	0.044	2.97
Three years after	0.018	0.012	0.005	0.010	0.002	0.009	0.015	0.000	0.012	-0.025	0.043	2.48

Accruals are defined as $\Delta CA - \Delta CL - DEP$ where ΔCA is the change in non-cash current assets; ΔCL the change in current liabilities excluding short-term debt and taxes payable; DEP is depreciation and amortization. Individual components of accruals are also reported: ΔAR, ΔINV, ΔOCA, ΔAP, ΔOCL are the changes in accounts receivable, inventories, other current assets, accounts payable and other current liabilities, respectively. Earnings is operating income after depreciation, and cash flow is the difference between earnings and accruals. All the above items are divided by average total firm assets. Log size is the natural logarithm of market value of equity (im millions of dollars); book-to-market is the ratio of book to market value of equity; average annual growth in sales over the prior 3 years is the average of the value-weighted annual growth rate in sales of each portfolio over the three years prior to portfolio formation.

Table 4
Returns for portfolios sorted by accrual components

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks are ranked by a component of accruals relative to average total assets and assigned to one of ten portfolios (assuming a reporting delay of four months from the end of the fiscal year). Annual buy-and-hold returns are calculated over the subsequent year, as well as returns in excess of the return on a control portfolio matched by size and book-to-market. Average returns in each of the first to third years following portfolio formation ($R1$, $R2$, $R3$ respectively) and excess returns in each of the first to third post-formation years ($AR1$, $AR2$, $AR3$) on the equally-weighted decile portfolios are reported. Also reported is the difference between the bottom and top decile portfolios and the 't'-statistic for the mean difference.

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	1-10	't'-stat
Panel A: Ranked by change in accounts receivable												
R1	0.165	0.161	0.161	0.165	0.170	0.175	0.156	0.151	0.142	0.112	0.054	2.66
R2	0.168	0.164	0.172	0.157	0.153	0.172	0.160	0.151	0.144	0.112	0.056	2.94
R3	0.183	0.186	0.192	0.177	0.173	0.175	0.181	0.177	0.165	0.140	0.043	2.78
AR1	0.006	0.005	0.007	0.012	0.021	0.023	0.007	0.005	-0.001	-0.025	0.031	2.23
AR2	0.004	0.001	0.009	0.003	0.000	0.018	0.010	0.002	0.001	-0.024	0.028	2.10
AR3	0.003	0.007	0.019	0.007	0.004	0.007	0.012	0.010	0.002	-0.015	0.018	1.17
Panel B: Ranked by change in inventory												
R1	0.190	0.174	0.176	0.163	0.158	0.154	0.161	0.155	0.133	0.095	0.095	4.63
R2	0.165	0.172	0.168	0.158	0.160	0.167	0.163	0.150	0.139	0.110	0.055	3.45
R3	0.182	0.185	0.177	0.189	0.164	0.178	0.181	0.180	0.167	0.144	0.038	2.06
AR1	0.029	0.014	0.023	0.014	0.012	0.005	0.011	0.006	-0.011	-0.043	0.072	4.34
AR2	0.001	0.012	0.013	0.009	0.006	0.012	0.011	-0.002	-0.008	-0.032	0.033	2.34
AR3	-0.001	0.007	0.010	0.021	-0.001	0.010	0.013	0.012	0.001	-0.017	0.016	0.84

Table 4 continued

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	1-10	'*t*'-stat
Panel C: Ranked by change in other current assets												
R1	0.187	0.172	0.155	0.149	0.158	0.154	0.154	0.151	0.145	0.133	0.054	4.61
R2	0.161	0.163	0.175	0.151	0.160	0.153	0.140	0.158	0.142	0.148	0.014	1.29
R3	0.184	0.174	0.182	0.163	0.178	0.165	0.185	0.170	0.172	0.174	0.011	0.75
AR1	0.033	0.018	0.004	-0.001	0.006	0.004	0.002	0.006	0.000	-0.012	0.045	4.29
AR2	0.004	0.005	0.019	-0.004	0.005	0.000	-0.013	0.010	-0.005	0.002	0.002	0.14
AR3	0.009	-0.002	0.012	-0.007	0.009	-0.005	0.019	0.003	0.009	0.008	0.000	0.01
Panel D: Ranked by change in accounts payable												
R1	0.184	0.167	0.162	0.166	0.160	0.156	0.160	0.149	0.145	0.109	0.074	5.86
R2	0.153	0.168	0.166	0.164	0.164	0.171	0.154	0.156	0.135	0.120	0.033	2.55
R3	0.179	0.184	0.176	0.173	0.187	0.176	0.167	0.175	0.175	0.154	0.024	1.60
AR1	0.026	0.011	0.009	0.016	0.009	0.007	0.010	0.003	-0.001	-0.031	0.057	5.79
AR2	-0.006	0.008	0.008	0.009	0.010	0.019	0.002	0.006	-0.014	-0.021	0.015	1.21
AR3	0.002	0.010	0.006	0.003	0.020	0.007	-0.001	0.006	0.009	-0.007	0.009	0.49
Panel E: Ranked by change in other current liabilities												
R1	0.147	0.158	0.141	0.158	0.161	0.167	0.162	0.151	0.164	0.148	-0.001	-0.07
R2	0.142	0.156	0.160	0.154	0.166	0.155	0.160	0.163	0.155	0.138	0.004	0.27
R3	0.177	0.179	0.164	0.167	0.183	0.179	0.183	0.184	0.165	0.167	0.010	0.75
AR1	-0.006	0.002	-0.012	0.005	0.008	0.016	0.013	0.003	0.021	0.011	-0.017	-1.28
AR2	-0.014	-0.001	0.001	-0.003	0.009	0.000	0.007	0.013	0.010	0.000	-0.013	-1.01
AR3	0.003	0.006	-0.008	-0.005	0.007	0.006	0.015	0.018	0.004	0.009	-0.006	-0.46

Table 5
Returns for portfolios sorted by discretionary
and non-discretionary accruals

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks are ranked by accruals (discretionary or non-discretionary) relative to average total assets. Based on the ranking stocks are assigned to one of ten portfolios (assuming a reporting delay of four months from the end of the fiscal year). Annual buy-and-hold returns are calculated over the subsequent year, as well as returns in excess of the return on a control portfolio matched by size and book-to-market. Raw returns and excess returns in each of the three years following portfolio formation($R1$ through $R3$ and $AR1$ through $AR3$, respectively) on the equally-weighted decile portfolios are reported. The return spread between the bottom and top deciles, $(1)-(10)$ and its 't'-statistic, as well as the spread between the second and ninth deciles $(2)-(9)$ and its 't'-statistic, are also reported.

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	(1)-(10)	't'-stat	(2)-(9)	't'-stat
Discretionary accruals														
R1	0.178	0.190	0.178	0.171	0.163	0.150	0.149	0.152	0.128	0.100	0.078	5.50	0.062	6.01
R2	0.159	0.175	0.171	0.159	0.165	0.159	0.154	0.154	0.144	0.110	0.049	4.13	0.032	2.33
R3	0.186	0.188	0.182	0.188	0.187	0.174	0.167	0.171	0.160	0.145	0.041	3.10	0.028	2.07
AR1	0.032	0.036	0.023	0.017	0.010	0.000	-0.000	0.004	-0.019	-0.043	0.074	5.51	0.056	5.79
AR2	0.008	0.018	0.013	0.001	0.010	0.006	0.001	0.003	-0.004	-0.033	0.041	3.74	0.022	1.66
AR3	0.016	0.015	0.010	0.014	0.017	0.004	-0.002	0.004	-0.007	-0.015	0.031	2.71	0.021	1.87
Non-discretionary accruals														
R1	0.139	0.166	0.157	0.163	0.165	0.161	0.158	0.153	0.159	0.135	0.004	0.17	0.007	0.46
R2	0.138	0.156	0.169	0.159	0.166	0.155	0.174	0.149	0.158	0.126	0.012	0.67	-0.002	-0.10
R3	0.161	0.168	0.184	0.179	0.178	0.174	0.192	0.179	0.175	0.156	0.006	0.31	-0.007	-0.36
AR1	-0.011	0.011	0.008	0.014	0.012	0.008	0.007	0.003	0.013	-0.005	-0.006	-0.26	-0.001	-0.10
AR2	-0.013	0.000	0.013	0.004	0.011	0.001	0.019	-0.004	0.006	-0.016	0.003	0.19	-0.006	-0.38
AR3	-0.007	-0.002	0.013	0.009	0.006	0.003	0.023	0.010	0.006	-0.006	-0.001	-0.05	-0.008	-0.49

Accruals are defined as the change in non-cash current assets less the change in current liabilities excluding short-term debt and taxes payable and minus depreciation. Each of the relevant current asset and current liability items for firm i in year t, I_{it}, is related to the firm's current-year sales, $Sales_{it}$, as follows:

$$E_t(I_{it}) = \frac{\sum_{k=1}^{5} I_{it-k}}{\sum_{k=1}^{5} Sales_{it-k}} Sales_{it}.$$

The nondiscretionary component of the change in an item is given by $E_t(I_{it}) - I_{it-1}$ while the discretionary component is $I_{it} - E_t(I_{it})$.

Table 6
Return spreads for portfolios sorted by discretionary
and non-discretionary values of accrual components

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks are ranked by the discretionary or nondiscretionary values of each component of accruals (relative to average total assets). Based on the ranking stocks are assigned to one of ten portfolios (assuming a reporting delay of four months from the end of the fiscal year). All stocks are equally-weighted in each portfolio. Annual buy-and-hold returns are calculated over each of the three years following portfolio formation (denoted $R1$ to $R3$), as well as $AR1$ to $AR3$, returns in excess of the return on a control portfolio matched by size and book-to-market in the first to third post-formation years. The table reports the difference in the raw returns and excess returns between the bottom-ranked and top-ranked decile portfolios (denoted (1)-(10)) and the associated 't'-statistic.

Accruals are defined as the change in non-cash current assets less the change in current liabilities excluding short-term debt and taxes payable and minus depreciation. Each of the relevant current asset and current liability items for firm i in year t, I_{it}, is related to the firm's current-year sales, $Sales_{it}$, as follows:

$$E_t(I_{it}) = \frac{\sum_{k=1}^{5} I_{it-k}}{\sum_{k=1}^{5} Sales_{it-k}} Sales_{it}.$$

The nondiscretionary component of the change in an item is given by $E_t(I_{it}) - I_{it-1}$ while the discretionary component is $I_{it} - E_t(I_{it})$.

	Discretionary		Nondiscretionary	
	(1)-(10)	't'	(1)-(10)	't'
Panel A: Ranked by change in accounts receivable				
R1	0.034	2.89	0.033	1.84
R2	0.027	2.41	0.027	1.53
R3	0.020	1.40	0.033	2.13
AR1	0.035	2.99	0.007	0.51
AR2	0.022	2.08	-0.001	-0.04
AR3	0.017	1.29	0.008	0.43
Panel B: Ranked by change in inventory				
R1	0.093	7.17	0.008	0.33
R2	0.045	4.03	0.011	0.73
R3	0.035	3.05	0.007	0.34
AR1	0.091	7.02	-0.015	-0.71
AR2	0.039	3.45	-0.008	-0.53
AR3	0.028	2.47	-0.009	-0.36
Panel C: Ranked by change in accounts payable				
R1	0.038	4.24	0.040	2.93
R2	0.000	0.03	0.038	2.72
R3	0.005	0.34	0.036	1.98
AR1	0.041	4.95	0.015	1.40
AR2	0.002	0.21	0.010	1.02
AR3	0.011	0.87	0.010	0.48

Table 7
Special items and accruals (as percent of total assets)
in pre- and post-formation years for portfolios
sorted by accruals

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks are ranked by accruals relative to average total assets and assigned to one of five portfolios (assuming a reporting delay of four months from the end of the fiscal year). In each of the three years up to the date of portfolio formation, and three years after portfolio formation, the average ratio of special items (Compustat annual data item 17), or accruals (defined as in equation (1) of the text), or discretionary accruals (defined as in equations (2) and (4) of the text) to average total assets (Compustat annual data item 6) is calculated over all firms in a portfolio. The numbers are reported in percentages.

Panel A: Special items

	Sorted by accruals				
Year	1 (Low)	2	3	4	5 (High)
Two years before	-0.23	-0.19	-0.13	-0.13	-0.16
One year before	-0.35	-0.22	-0.19	-0.15	-0.19
Year of portfolio formation	-0.71	-0.22	-0.15	-0.06	-0.06
One year after	-0.41	-0.36	-0.30	-0.38	-0.49
Two years after	-0.58	-0.44	-0.44	-0.55	-0.80
Three years after	-0.63	-0.55	-0.49	-0.60	-0.97

Panel B: Accruals

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)
Two years before	-3.51	-3.77	-3.11	-2.58	-2.20	-1.48	-0.62	0.36	1.64	4.16
One year before	-3.49	-4.19	-3.61	-3.06	-2.56	-1.91	-1.16	-0.17	1.47	5.56
Year of portfolio formation	-16.23	-8.75	-6.28	-4.56	-3.03	-1.49	0.32	2.73	6.69	18.90
One year after	-4.60	-4.45	-3.76	-3.14	-2.33	-1.67	-1.24	-0.30	1.01	3.78
Two years after	-5.11	-4.56	-4.02	-3.32	-2.90	-2.30	-1.91	-0.85	-0.49	0.56
Three years after	-5.44	-4.96	-4.30	-3.71	-3.02	-2.83	-2.24	-1.80	-1.36	-1.23

Panel C: Discretionary accruals

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)
Two years before	0.00	-0.43	-0.39	-0.37	-1.06	-0.61	-0.32	-0.28	-0.34	0.26
One year before	1.54	-0.89	-0.44	-0.44	-0.66	-0.58	-0.81	-0.83	-0.84	0.30
Year of portfolio formation	-8.46	-4.13	-2.82	-1.88	-1.28	-0.62	0.03	1.25	3.44	9.93
One year after	-4.86	-2.53	-1.86	-1.29	-0.90	-0.48	-0.20	0.44	1.36	2.88
Two years after	-2.58	-1.96	-1.54	-1.17	-1.14	-0.86	-0.75	-0.13	-0.01	0.01
Three years after	-2.29	-1.69	-1.51	-1.34	-1.10	-1.27	-1.06	-1.06	-1.07	-1.83

Table 8
Fama-MacBeth cross-sectional regressions of abnormal returns on accruals and accrual components

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, cross-sectional regressions are estimated of individual stocks' abnormal returns on the following variables from the prior year (assuming a reporting delay of four months from the end of the fiscal year): accruals (the change in non-cash current assets less the change in current liabilities excluding short-term debt and taxes payable and minus depreciation); change in accounts receivable (ΔAR); change in inventory (ΔINV); and change in accounts payable (ΔAP). A stock's abnormal return is its return in excess of the return on a control portfolio matched by size and book-to-market. In panel A the explanatory variables are raw levels of accruals or individual accrual items. In panel B the explanatory variables are discretionary accruals or individual discretionary accrual items. Each of the non-cash current asset and current liability items for firm i in year t, I_{it}, is related to the firm's current-year sales, $Sales_{it}$, as follows:

$$E_t(I_{it}) = \frac{\sum_{k=1}^{5} I_{it-k}}{\sum_{k=1}^{5} Sales_{it-k}} Sales_{it}.$$

The nondiscretionary component of the change in an item is given by $E_t(I_{it}) - I_{it-1}$ while the discretionary component is $I_{it} - E_t(I_{it})$. The reported statistics are the time series average of monthly regression coefficients together with their 't'-statistics (in parentheses).

Panel A: Raw accruals as explanatory variables

	Constant	Accruals	ΔAR	ΔINV	ΔAP
(1)	-0.0032	-0.2627			
	(-0.80)	(-4.14)			
(2)	0.0080		-0.2622		
	(1.69)		(-3.36)		
(3)	0.0091			-0.3197	
	(1.75)			(-3.50)	
(4)	0.0063				-0.3550
	(1.89)				(-3.29)
(5)	0.0119		-0.1490	-0.2661	-0.0120
	(2.20)		(-1.69)	(-2.83)	(-0.08)

Panel B: Discretionary accruals as explanatory variables

	Constant	Accruals	ΔAR	ΔINV	ΔAP
(6)	-0.0014	-0.2419			
	(-0.39)	(-5.20)			
(7)	0.0009		-0.2396		
	(0.26)		(-4.34)		
(8)	-0.0011			-0.3468	
	(-0.31)			(-5.11)	
(9)	0.0012				-0.2125
	(0.34)				(-1.95)
(10)	-0.0007		-0.1784	-0.3259	0.0229
	(-0.19)		(-2.60)	(-4.55)	(0.18)

Table 9
Portfolio returns based on return
prediction regressions

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, four models are used to predict each stock's future return, based on values of components of accruals from the most recently ended fiscal year (assuming a reporting delay of four months from the fiscal year-end). Based on the predicted return from each model, stocks are ranked and assigned to one of ten portfolios. Over the subsequent year each portfolio's equally weighted buy-and-hold raw return ($R1$) and abnormal return ($AR1$) are calculated. A stock's abnormal return is its return in excess of a control portfolio matched by size and book-to-market. The reported numbers are the mean return on each portfolio over all years, and the average spread in returns between the top and bottom deciles.

Model	Return	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	(10)-(1)
(1)	R1	0.122	0.180	0.189	0.192	0.184	0.192	0.194	0.206	0.207	0.205	0.083
	AR1	-0.053	0.006	0.008	0.010	0.001	0.011	0.011	0.020	0.020	0.017	0.070
(2)	R1	0.127	0.160	0.178	0.188	0.195	0.198	0.196	0.198	0.213	0.216	0.089
	AR1	-0.052	-0.019	-0.003	0.006	0.011	0.013	0.012	0.016	0.030	0.036	0.088
(3)	R1	0.123	0.175	0.192	0.186	0.195	0.202	0.191	0.196	0.198	0.212	0.089
	AR1	-0.049	0.001	0.013	0.007	0.013	0.019	0.011	0.013	0.004	0.017	0.066
(4)	R1	0.123	0.167	0.173	0.190	0.184	0.197	0.201	0.207	0.209	0.220	0.097
	AR1	-0.059	-0.016	-0.006	0.009	0.001	0.015	0.019	0.024	0.025	0.038	0.097

Four return prediction models are used. In model (1), the predictors are depreciation and changes in: accounts receivable, inventory, other current assets, accounts payable and other current liabilities. Model (2) uses the same variables, but is based on the discretionary components of these items. Model (3) uses as predictors the change in: inventory, accounts receivable, and accounts payable. Model (4) uses the discretionary values of these three variables, calculated as follows. Each of the relevant current asset and current liability items for firm i in year t, I_{it}, is related to the firm's current-year sales, $Sales_{it}$, as follows:

$$E_t(I_{it}) = \frac{\sum_{k=1}^{5} I_{it-k}}{\sum_{k=1}^{5} Sales_{it-k}} Sales_{it}.$$

The nondiscretionary component of the change in an item is given by $E_t(I_{it}) - I_{it-1}$ while the discretionary component is $I_{it} - E_t(I_{it})$. At each year-end the parameters of each model are the rolling averages of the estimates from all previous years' cross-sectional regressions.

Table 10
Differences in excess returns across portfolios
sorted by accruals within industries

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks in a given industry are ranked by accruals relative to average total assets and assigned to one of four portfolios (assuming a reporting delay of four months from the end of the fiscal year). Annual buy-and-hold returns are calculated over the subsequent year, and measured in excess of the return on a control portfolio matched by size and book-to-market. The difference between the average excess returns across the bottom and top quartiles within each industry in each of the first to third years following portfolio formation ($AR1$, $AR2$, $AR3$) are reported. Also reported is the average return difference over industries and the 't'-statistic for the mean difference. Definitions of industries are from Fama and French (1997).

Code	Industry name	AR1	AR2	AR3
1	Food	0.016	-0.031	0.038
2	Drink	0.038	0.024	-0.031
3	Toys	0.109	0.073	0.122
4	Books	0.064	0.015	0.016
5	Hshld	0.091	0.079	0.066
6	Clths	0.064	0.015	0.016
7	MedEq	0.017	-0.001	-0.069
8	Drugs	-0.037	-0.005	-0.023
9	Chems	0.024	0.010	-0.021
10	Rubbr	0.086	0.074	0.081
11	Txtls	0.059	0.090	0.060
12	BldMt	0.058	0.070	0.036
13	Cnstr	0.162	0.084	-0.007
14	Steel	0.036	-0.053	-0.016
15	Mach	0.061	0.049	0.059
16	ElcEq	0.086	0.063	-0.016
17	Autos	0.081	-0.016	0.041
18	Mines	-0.045	0.004	0.002
19	Enrgy	-0.023	0.005	0.023
20	Util	0.035	0.047	0.011
21	Telcm	0.066	0.014	0.002
22	Bussv	0.041	0.035	0.000
23	Comps	0.094	-0.046	-0.009
24	Chips	0.050	0.084	0.109
25	LabEq	0.053	0.039	0.008
26	Paper	0.062	0.061	-0.013
27	Boxes	0.074	0.033	0.004
28	Trans	0.011	-0.014	-0.034
29	Whlsl	0.036	-0.006	0.076
30	Rtail	0.028	0.028	0.036
31	Meals	0.037	0.051	0.051
32	Other	0.071	0.015	0.038
	Average	0.050	0.028	0.021
	't'	6.86	4.13	2.75

Table 11
Returns for portfolios sorted by accruals and
selected accrual components, U.K. data

The sample comprises all domestic common U.K. listed stocks (except financial firms) with available dataon the Xpressfeed database. At the end of April each year from 1991 to 2000, all stocks are ranked by total accruals (panel A) or by a component of accruals (panels B to D) relative to average total assets and assigned to one of ten portfolios (assuming a reporting delay of four months from the end of the fiscal year). Annual buy-and-hold returns are calculated over the subsequent year, as well as returns in excess of the return on a control portfolio matched by size and book-to-market. Average returns in each of the first to third years following portfolio formation ($R1$, $R2$, $R3$ respectively) and excess returns in each of the first to third post-formation years ($AR1$, $AR2$, $AR3$) on the equally-weighted decile portfolios are reported.

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	1-10
Panel A: Ranked by total accruals											
R1	0.205	0.174	0.152	0.118	0.080	0.109	0.103	0.057	0.060	0.070	0.135
R2	0.176	0.140	0.078	0.121	0.111	0.083	0.071	0.099	0.081	0.081	0.095
R3	0.135	0.076	0.103	0.041	0.090	0.079	0.092	0.070	0.068	0.101	0.034
AR1	0.060	0.045	0.049	0.012	-0.024	0.012	0.004	-0.046	-0.060	-0.048	0.108
AR2	0.030	0.015	-0.024	0.022	0.017	-0.020	-0.030	0.005	-0.047	-0.038	0.067
AR3	0.008	-0.037	0.002	-0.047	-0.014	-0.026	-0.003	-0.035	-0.052	-0.031	0.039
Panel B: Ranked by change in accounts receivable											
R1	0.122	2 0.095	0.120	0.098	0.108	0.104	0.077	0.107	0.159	0.137	-0.015
R2	0.131	0.120	0.104	0.100	0.093	0.084	0.100	0.061	0.109	0.135	-0.005
R3	0.090	0.075	0.112	0.074	0.060	0.068	0.089	0.101	0.058	0.119	-0.029
AR1	-0.004	-0.019	0.013	0.006	0.005	-0.003	-0.020	-0.006	0.040	-0.012	0.008
AR2	-0.003	0.007	0.012	0.004	0.011	-0.028	-0.005	-0.059	-0.010	-0.002	-0.001
AR3	-0.024	-0.046	0.008	-0.019	-0.031	-0.015	-0.022	-0.009	-0.059	-0.024	0.000
Panel C: Ranked by change in inventory											
R1	0.130	0.132	0.160	0.140	0.172	0.090	0.104	0.094	0.056	0.049	0.081
R2	0.130	0.120	0.132	0.092	0.174	0.146	0.074	0.042	0.067	0.064	0.066
R3	0.063	0.090	0.124	0.093	0.116	0.089	0.075	0.078	0.052	0.070	-0.007
AR1	0.009	0.016	0.055	0.026	0.061	-0.021	0.001	-0.016	-0.056	-0.072	0.080
AR2	-0.010	0.023	0.017	-0.004	0.059	0.044	-0.033	-0.055	-0.057	-0.051	0.042
AR3	-0.049	-0.025	0.015	0.003	0.005	-0.015	-0.028	-0.025	-0.052	-0.065	0.016

Table 11 continued

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)	1-10
Panel D: Ranked by change in accounts payable											
R1	0.117	0.088	0.111	0.097	0.132	0.090	0.109	0.126	0.133	0.122	-0.005
R2	0.127	0.105	0.098	0.111	0.099	0.080	0.089	0.095	0.122	0.112	0.016
R3	0.087	0.089	0.085	0.069	0.084	0.085	0.059	0.063	0.109	0.122	-0.034
AR1	-0.010	-0.021	0.003	-0.004	0.027	-0.020	0.016	0.007	0.020	-0.017	0.007
AR2	-0.003	-0.011	-0.001	-0.002	-0.006	-0.015	-0.005	-0.021	0.007	-0.015	0.012
AR3	-0.023	-0.030	-0.016	-0.027	-0.013	-0.015	-0.045	-0.052	-0.008	-0.012	-0.011

Appendix

Table A1

Operating performance of decile portfolios sorted by accruals

The sample comprises all domestic common stocks (except financial firms) on NYSE, Amex and Nasdaq with coverage on CRSP and Compustat, and with available data. At the end of April each year from 1971 to 1995, all stocks are ranked by accruals relative to average total assets and assigned to one of ten equally-weighted portfolios (assuming a reporting delay of four months from the end of the fiscal year). This table reports average values of accruals relative to average total assets, cash flow relative to average total assets, earnings relative to average total assets, three components of accruals (ΔAR, change in accounts receivable, ΔINV, change in inventories, ΔAP, change in accounts payable) relative to average total assets, sales turnover (sales relative to average total assets) and earnings to sales for each portfolio.

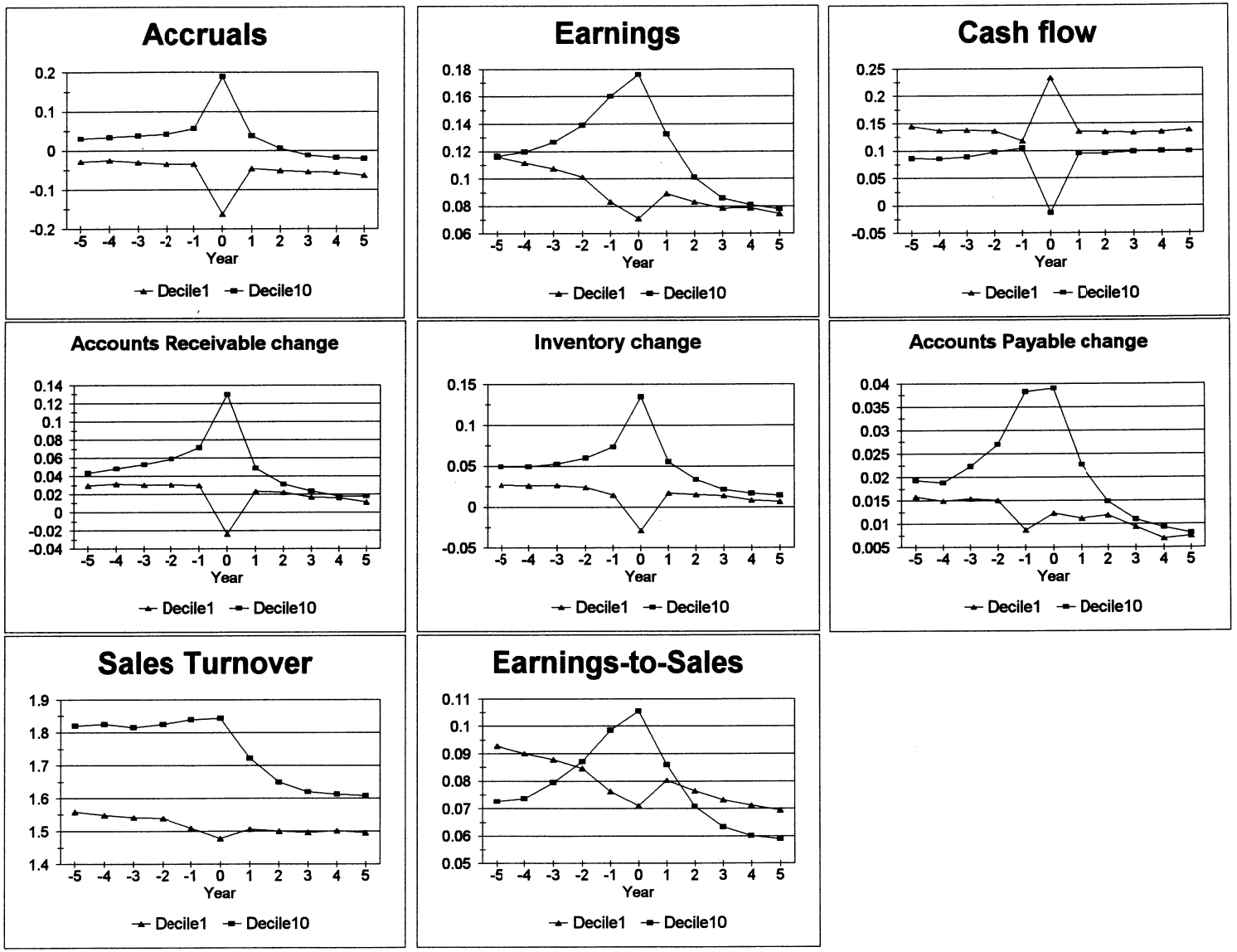
	1 (Low)	2	3	4	5	6	7	8	9	10 (high)
Panel A: Two years before portfolio formation										
Accruals	-0.035	-0.038	-0.031	-0.026	-0.022	-0.015	-0.006	0.004	0.016	0.042
Cash flow	0.136	0.151	0.149	0.147	0.142	0.138	0.138	0.135	0.130	0.097
Earnings	0.101	0.113	0.118	0.121	0.120	0.123	0.132	0.138	0.147	0.139
ΔAR	0.030	0.021	0.021	0.021	0.021	0.025	0.028	0.034	0.043	0.059
ΔINV	0.024	0.018	0.018	0.018	0.018	0.022	0.027	0.032	0.041	0.060
ΔAP	0.015	0.012	0.012	0.011	0.012	0.015	0.014	0.016	0.019	0.027
Sales turnover	1.540	1.517	1.462	1.457	1.411	1.474	1.556	1.684	1.729	1.825
Earnings to sales	0.085	0.095	0.102	0.107	0.116	0.111	0.104	0.097	0.096	0.087
Panel B: One year before portfolio formation										
Accruals	-0.035	-0.042	-0.036	-0.031	-0.026	-0.019	-0.012	-0.002	0.015	0.056
Cash flow	0.118	0.148	0.149	0.145	0.143	0.139	0.142	0.140	0.136	0.105
Earnings	0.083	0.106	0.113	0.115	0.117	0.119	0.130	0.138	0.151	0.160
ΔAR	0.030	0.019	0.020	0.019	0.019	0.022	0.027	0.032	0.045	0.071
ΔINV	0.015	0.014	0.014	0.017	0.017	0.020	0.025	0.033	0.043	0.073
ΔAP	0.009	0.009	0.011	0.012	0.012	0.014	0.016	0.020	0.024	0.038
Sales turnover	1.510	1.510	1.455	1.433	1.402	1.445	1.527	1.669	1.714	1.839
Earnings to sales	0.076	0.089	0.100	0.104	0.114	0.111	0.105	0.098	0.100	0.098
Panel C: Portfolio formation year										
Accruals	-0.162	-0.087	-0.063	-0.046	-0.030	-0.015	0.003	0.027	0.067	0.189
Cash flow	0.233	0.187	0.172	0.155	0.144	0.132	0.125	0.110	0.084	-0.013
Earnings	0.071	0.100	0.109	0.109	0.114	0.117	0.128	0.138	0.151	0.176
ΔAR	-0.024	0.001	0.007	0.011	0.015	0.021	0.029	0.041	0.063	0.130
ΔINV	-0.029	-0.006	0.000	0.005	0.011	0.018	0.027	0.041	0.063	0.134
ΔAP	0.012	0.010	0.009	0.008	0.009	0.010	0.011	0.014	0.019	0.039
Sales turnover	1.478	1.487	1.433	1.412	1.389	1.432	1.515	1.656	1.709	1.844
Earnings to sales	0.071	0.087	0.100	0.102	0.111	0.108	0.104	0.098	0.100	0.105

Appendix Table A1 continued

	1 (Low)	2	3	4	5	6	7	8	9	10 (high)
Panel D: One year after portfolio formation										
Accruals	-0.046	-0.045	-0.038	-0.031	-0.023	-0.017	-0.012	-0.003	0.010	0.038
Cash flow	0.135	0.148	0.147	0.140	0.133	0.127	0.132	0.131	0.122	0.095
Earnings	0.089	0.103	0.109	0.109	0.110	0.110	0.120	0.128	0.132	0.132
ΔAR	0.023	0.021	0.020	0.018	0.019	0.022	0.024	0.028	0.036	0.049
ΔINV	0.017	0.014	0.013	0.015	0.017	0.019	0.023	0.029	0.036	0.055
ΔAP	0.011	0.011	0.011	0.010	0.010	0.011	0.012	0.014	0.016	0.023
Sales turnover	1.506	1.492	1.430	1.412	1.379	1.417	1.500	1.631	1.662	1.722
Earnings to sales	0.080	0.089	0.099	0.102	0.109	0.104	0.100	0.093	0.090	0.086
Panel E: Two years after portfolio formation										
Accruals	-0.051	-0.046	-0.040	-0.033	-0.029	-0.023	-0.019	-0.009	-0.005	0.006
Cash flow	0.134	0.146	0.147	0.140	0.136	0.129	0.130	0.126	0.122	0.095
Earnings	0.083	0.101	0.107	0.106	0.107	0.106	0.110	0.118	0.117	0.101
ΔAR	0.022	0.018	0.017	0.017	0.017	0.018	0.020	0.025	0.028	0.031
ΔINV	0.015	0.014	0.013	0.013	0.014	0.015	0.018	0.024	0.024	0.034
ΔAP	0.012	0.010	0.009	0.009	0.010	0.009	0.010	0.011	0.012	0.015
Sales turnover	1.500	1.491	1.420	1.402	1.367	1.408	1.479	1.603	1.623	1.649
Earnings to sales	0.076	0.088	0.097	0.101	0.108	0.103	0.095	0.088	0.083	0.071
Panel F: Three years after portfolio formation										
Accruals	-0.054	-0.050	-0.043	-0.037	-0.030	-0.028	-0.022	-0.018	-0.014	-0.012
Cash flow	0.133	0.146	0.147	0.142	0.133	0.130	0.129	0.131	0.122	0.098
Earnings	0.079	0.097	0.103	0.105	0.103	0.102	0.107	0.112	0.108	0.086
ΔAR	0.017	0.016	0.015	0.016	0.015	0.015	0.017	0.018	0.022	0.023
ΔINV	0.014	0.012	0.011	0.011	0.012	0.013	0.016	0.018	0.021	0.021
ΔAP	0.009	0.009	0.009	0.008	0.008	0.008	0.009	0.009	0.010	0.011
Sales turnover	1.496	1.480	1.403	1.397	1.355	1.393	1.472	1.592	1.599	1.619
Earnings to sales	0.073	0.086	0.096	0.100	0.107	0.102	0.093	0.085	0.078	0.063

Accruals are defined as $\Delta CA - \Delta CL - DEP$ where ΔCA is the change in non-cash current assets; ΔCL the change in current liabilities excluding short-term debt and taxes payable; DEP is depreciation and amortization. Earnings is operating income after depreciation, and cash flow is the difference between earnings and accruals.

Figure 1: Operating performance of portfolios sorted by accruals



Note: All items except sales turnover and earnings-to-sales are divided by average total assets