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Accruals, cash flows, and aggregate stock returns ☆

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ABSTRACT

This paper examines whether the firm-level accrual and cash flow effects extend to the aggregate stock market. In sharp contrast to previous firm-level findings, aggregate accruals is a strong positive time series predictor of aggregate stock returns, and cash flows is a negative predictor. In addition, innovations in accruals are negatively contemporaneously correlated with aggregate returns, and innovations in cash flows are positively correlated with returns. These findings suggest that innovations in accruals and cash flows contain information about changes in discount rates, or that firms manage earnings in response to marketwide undervaluation.

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1. Introduction

There is strong and robust evidence that the level of accruals is a negative cross-sectional predictor of abnormal stock returns (Sloan, 1996). The accrual anomaly has been extended and applied in numerous papers in financial economics and accounting. Furthermore, there is evidence that the other component of earnings, cash flows, is a positive cross-sectional predictor of returns (Desai, Rajgopal, and Venkatachalam, 2004; Pincus, Rajgopal, and Venkatachalam, 2007). In this paper, we

test whether the accrual and cash flow effects extend to the market level, and whether the behavioral explanation for the firm-level effects can explain our aggregate evidence. In addition to examining whether aggregate accruals and aggregate cash flows predict aggregate stock returns, we test whether innovations in aggregate accruals and aggregate cash flows are contemporaneously associated with aggregate returns, as would be implied if accrual innovations and cash flow innovations are correlated with shifts in discount rates.

An explanation that has been offered for the firm-level accrual and cash flow effects, the earnings fixation hypothesis, holds that naïve investors fixate on earnings and fail to attend separately to the cash flow and accrual components of earnings. Since the cash flow component of earnings is a more positive forecaster of future earnings than the accrual component of earnings (Sloan, 1996), investors who neglect this distinction become overly optimistic about the future prospects of firms with high accruals but low cash flows, and overly pessimistic about

the future prospects of firms with low accruals but high cash flows.[1] As a result, high accrual and low cash flow firms become overvalued, and subsequently earn low abnormal returns. Similarly, low accrual and high cash flow firms become undervalued, and are followed by high abnormal returns.

But does a high level of aggregate accruals induce overvaluation of the entire stock market? Some commentators allege that during certain periods, such as the market boom of the late 1990s, firms managed earnings aggressively, and that auditors and regulators were compliant, thereby allowing firms to increase their earnings relative to underlying cash flows. Also, there is general evidence of aggregate variations in new issue activity, and that firms tend to manage earnings upward prior to new issues (Teoh, Welch, and Wong, 1998). Alternatively, it could be that earnings management is primarily firm-specific, with an aim at achieving managerial goals such as smoothing the firm-specific deviations of earnings performance from that of industry peers.

Even in the absence of aggregate fluctuations in earnings management, we expect to see aggregate variations in accruals, because macroeconomic fluctuations affect firms' operating and reporting outcomes. For example, increases in aggregate demand over the business cycle could lead to increased purchases from firms, which would be manifested in part by an increase in receivables.[2] Furthermore, when consumer confidence is high or when macroeconomic conditions make credit easy, consumers may buy more on credit, increasing aggregate receivables. Alternatively, if firms expect a future rise in aggregate demand, they may accumulate inventories in anticipation, which again are accounted for as positive accruals.[3]

Just as accruals and cash flows have different implications for future earnings performance at the firm level, aggregate accruals and aggregate cash flows can differ in their implications for future aggregate earnings. If aggregate accruals is a less favorable predictor than aggregate cash flows of future aggregate earnings, and if investors neglect the distinction between cash flows and accruals, then high aggregate accruals will cause overvaluation of the stock market, and therefore will predict low subsequent returns. In addition, high aggregate cash flows will predict high subsequent returns. To test these hypotheses, we estimate the abilities of aggregate accruals versus cash flows to predict future aggregate earnings, and test whether the levels of aggregate accruals and cash flows are predictors of aggregate stock returns.

A possible reason to question whether the accrual and cash flow effects will extend to the aggregate level is that investors and macro analysts devote considerable effort to studying the market as a whole, and information costs and arbitrage costs are less significant at the aggregate level. On the other hand, several authors argue that markets should be more efficient in setting the relative prices of stocks than in setting the price level of the aggregate market.[4] Empirically, some firm-level effects (such as poor return performance after equity issuance) do extend to the aggregate level (Baker and Wurgler, 2000), whereas others (such as the post-earnings announcement drift effect, PEAD) become much weaker (Kothari, Lewellen, and Warner, 2006). It is therefore an empirical question whether the accrual and cash flow effects hold in the time series at the aggregate level.

An alternative to the earnings fixation hypothesis is that at the aggregate level accruals and cash flows are correlated with rational variations in discount rates. Since both accruals and cash flows are related to shifts in demand, inventories, and investment activity, a natural hypothesis is that they are associated with business cycle shifts in risk premiums. It is therefore important to control for variables that are associated with business cycle fluctuations and possible shifts in discount rates.

In our aggregate earnings persistence regressions, we find that the accrual component of aggregate earnings is less persistent than the cash flow component, with a difference in coefficients that is much larger than that in the firm-level regressions of Sloan (1996). Thus, the earnings fixation hypothesis at the aggregate level predicts that aggregate accruals will negatively predict aggregate returns, and that aggregate cash flows will positively predict aggregate returns.

We then test the abilities of aggregate accruals and aggregate cash flows to predict aggregate returns using both univariate regressions, and multivariate regressions that control for several business cycle variables that have been proposed as return predictors in past literature. In sharp contrast with the well-known firm-level findings, we find that for the 1965–2005 period, the level of aggregate accruals is a strong positive predictor of aggregate stock returns. Furthermore, the level of aggregate cash flows is a strong negative predictor of aggregate returns.

Our multivariate regressions control for several forecasting variables suggested in past literature: the aggregate dividend-to-price ratio, the aggregate earnings-to-price ratio, the accounting rate of return (earnings/assets), the aggregate book-to-market ratio, the default spread on corporate bonds, the term spread on Treasuries, the equity share in aggregate new issues, and the short-term interest rate.[5] These controls can be viewed as possible proxies for

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[1] Earnings management is only one possible reason for the lower persistence of the accrual component of earnings. Thus, the accrual and cash flow effects are compatible with, but do not require, earnings management.

[2] One firm's receivables can be another firm's payables, which can lead to some cancellation at the aggregate level. But since firms transact with individuals as well as other firms, this cancellation is not complete.

[3] Thomas and Zhang (2002) show that the cross-sectional accrual effect is in part related to the level of inventories.

[4] Relative pricing disparities can be identified, for example, using price/earnings comparables, and can be arbitraged with relatively low risk using diversified long-short hedge strategies. Thus, Samuelson (1998) argues that the stock market is "micro efficient" but "macro inefficient." Jung and Shiller (2005) provide evidence in support of Samuelson's claim.

[5] A large literature examines the relation between aggregate cash flow- or earnings-related proxies with aggregate stock returns, including Fama (1990), Schwert (1990), Kothari and Shanken (1992), Hecht and Vuolteenaho (2006), and Sadka (2007). Keim and Stambaugh (1986),

discount rates, since they reflect shifts in aggregate business cycles and business conditions. For example, the default spread reflects expectations of risk of defaults; the term spread reflects (among other things) expectations about inflation; and the aggregate earnings-to-price ratio, aggregate accounting rate of return, aggregate dividend-to-price ratio, and aggregate book-to-market ratio should correlate with market beliefs about corporate growth prospects. In the multivariate regressions, the level of aggregate accruals continues to positively and significantly predict aggregate stock returns, and the level of aggregate cash flows continues to negatively predict aggregate returns.

Taking the univariate and multivariate regression results together, the evidence indicates that accruals is a positive time series predictor, and cash flows is a negative time series predictor, of aggregate stock returns. These results are inconsistent with the prediction of the earnings fixation hypothesis at the aggregate level, and are of the opposite signs from the firm-level effects associated with accruals and cash flows.

An alternative risk-based explanation for the aggregate return predictability of accruals and cash flows is that high aggregate accruals or low aggregate cash flows are associated with high levels of risk (implying a high expected stock return), above and beyond any risks captured by our controls. To evaluate this explanation, in a similar spirit to Kothari, Lewellen, and Warner (2006), we perform univariate and multivariate tests of the relation between innovations in aggregate accruals and cash flows and contemporaneous stock returns. We find that innovations in aggregate accruals are negatively related to contemporaneous aggregate returns, and innovations in aggregate cash flows are positively related to contemporaneous aggregate returns, even after controlling for innovations in other discount rate proxies. These findings suggest that positive innovations in accruals or negative innovations in cash flows are associated with heavier discounting of future profits, which leads to a decline in the stock market.

Since accruals and cash flows are components of earnings, the above findings are also consistent with the findings of Kothari, Lewellen, and Warner (2006) and Sadka (2007) that aggregate earnings surprises are negatively contemporaneously correlated with aggregate

stock returns.[6] Our analyses show that the negative relation between earnings surprises and aggregate returns derives primarily from the accrual component of the earnings surprises, rather than from the surprises in cash flows.[7] Indeed, cash flow surprises seem to have a dampening effect on the negative earnings/return relation identified by Kothari, Lewellen, and Warner (2006).

To gain further insight into firm-level versus aggregate-level effects, we also examine the abilities of accruals and cash flows to predict earnings and returns at the sector and industry levels. We find that accruals and cash flows positively predict returns in some sectors and industries (especially in High Tech), and negatively in others. However, the patterns across sectors and industries of return predictability do not align closely with the differences in the abilities of accruals versus cash flows to predict future earnings. Thus, the evidence provides little support for the earnings fixation hypothesis at the industry and sector levels as well as at the aggregate level.

There are other papers that test whether firm-level cross-sectional return predictors also predict returns in the time series. For example, Kothari and Shanken (1997), Pontiff and Schall (1998), and Lewellen (1999) provide evidence that book-to-market ratio predicts the returns on the market portfolio and size- and book-to-market-sorted portfolios.

Kothari, Lewellen, and Warner (2006), or KLW, test whether the PEAD effect (Bernard and Thomas, 1990), in which firm-level earnings surprises are on average followed by a continuation of stock returns over the next nine months, extends to the aggregate level. KLW find little evidence of drift in the stock market as a whole in response to aggregate earnings surprises, in contrast with the firm-level evidence. KLW also provide evidence of a negative contemporaneous relation between aggregate earnings surprises and stock returns, consistent with aggregate earnings surprises being correlated with shifts in discount rates.

The behavioral explanation for the PEAD effect is that investors neglect the information contained in earnings, or do not understand the time series properties of earnings surprises. The behavioral hypothesis for the accrual and cash flow effects is that naïve investors fixate on earnings while neglecting the information contained in different components of earnings (cash flows versus accruals). Thus, our paper and KLW's provide complementary examinations of whether firm-level effects that have been attributed to investor psychology extend to the aggregate level.

Our paper is not a direct test of whether the behavioral earnings fixation hypothesis explains the firm-level accrual and cash flow effects. However, it does provide

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(footnote continued)

Fama and French (1989), Pontiff and Schall (1998), and Hou and Robinson (2006) study the long-term yield spread (term spread) as a predictor of aggregate stock returns. Keim and Stambaugh (1986) and Fama and French (1989) study the ability of the default spread on corporate bonds to predict aggregate stock returns. Papers examining aggregate dividend-to-price ratio as an aggregate return predictor include Shiller (1984), Fama and French (1988), Campbell and Shiller (1988), Kothari and Shanken (1997), and Lewellen (2004). Kothari and Shanken (1997) and Pontiff and Schall (1998) find that aggregate book-to-market ratio is a positive predictor of aggregate returns. Baker and Wurgler (2000) find that the equity share in new issues is a negative predictor of one-year-ahead market returns. Fama and Schwert (1977), Breen, Glosten, and Jagannathan (1989), and Ang and Bekaert (2007) find that the short rate is a negative predictor of aggregate stock returns.

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[6] Sadka and Sadka (2008) point out that the negative contemporaneous earnings-return correlation could also derive from investors demanding a low risk premium at times of high expected future earnings. A similar point applies to our contemporaneous accrual/return and cash flow/return findings.

[7] In multivariate regressions where both the accruals surprise and the earnings surprise are included as regressors, the accrual surprise remains highly significant whereas the earnings surprise does not.

out-of-sample evidence about the extent to which the behavioral theory used to explain the firm-level findings explains a broader range of stylized facts. Our findings at a minimum suggest a limit to the scope of the earnings fixation theory. In the conclusion of the paper we discuss possible ways to reconcile the firm-level and aggregate time series findings.

The remainder of this paper is structured as follows. Section 2 describes the data and empirical methods. Section 3 examines the abilities of aggregate accruals and cash flows to predict aggregate earnings and returns. Section 4 examines the contemporaneous relations between innovations in accruals and cash flows and aggregate returns. Section 5 presents evidence of accruals and cash flows as a predictor of sector- and industry-level earnings and returns. Section 6 concludes.

2. Data and empirical methods

2.1. Data

Our empirical analyses employ annual returns (including distributions) on the Center for Research in Security Prices (CRSP) value-weighted market index (CRSPRET), and the value-weighted portfolio of the subsample of CRSP firms that have sufficient accounting information to calculate operating accruals and cash flows (SAMPLERET), over the sample period 1965 through 2005. Annual returns are computed by compounding monthly returns from May of year t to April of year $t+1$.

Accounting information is obtained from the Compustat database. Earnings is operating income after depreciation. Accruals is calculated using the indirect balance sheet method as the change in non-cash current assets less the change in current liabilities excluding the change in short-term debt and the change in taxes payable, minus depreciation and amortization expense.[8] Cash flows is computed as the difference between earnings and accruals. Earnings, accruals, and cash flows are measured for firms with December fiscal year ends in year $t-1$, and are scaled by lagged total assets. We then take value-weighted averages (using market capitalization at the end of December in year $t-1$ as weight) of scaled earnings, accruals, and cash flows across all firms in our sample to form aggregate series of the three variables (denoted EARNING, ACCRUAL, and CASHFLOW, respectively).

In addition, we employ several other variables that have been shown in the literature to have predictive power on aggregate stock returns. These variables potentially reflect shifts in business cycles and business conditions, and therefore could serve as proxies for market discount rates. They include the value-weighted earnings-to-price ratio (E/P), the value-weighted book-to-market ratio (BE/ME), the equity share in total new equity and debt issues (ESHARE) as in Baker and Wurgler (2000) for year $t-1$, the dividend-to-price ratio for the CRSP value-weighted index (D/P) which equals total dividends accrued to the index from May of year $t-1$ to April of year t divided by the index level at the end of April of year t, the default spread (DEF) which is the difference between the Moody's Baa bond yield and Aaa bond yield, the term spread (TERM) which is the difference between ten- and one-year Treasury constant maturity rates, and the short-term interest rate (TBILL) which is the 30-day T-bill rate. The interest rate variables are measured at the beginning of May of year t using data from the St. Louis Federal Reserve Economic Database (FRED).

2.2. Test methods

In standard time series predictive regressions in which returns of various holding periods are regressed on a variable measured at the beginning of the period, the regression coefficient is subject to an upward small-sample bias if innovations in the independent variable are negatively correlated with contemporaneous returns (see, e.g., Stambaugh, 1986; Mankiw and Shapiro, 1986). Of particular concern are scaled-price variables such as the dividend-to-price ratio or book-to-market ratio, since a large positive return is usually accompanied by a decrease in the level of those variables. As a result, the regression error terms are negatively correlated with the innovations in the independent variable, causing the regression coefficient to be upward biased. This bias is more pronounced when the sample size is small, the independent variable is highly persistent, or when the correlation between the regression errors and the innovations in the independent variable is strong.

Aggregate accruals and cash flows are not scaled-price variables. However, empirically we do find that innovations in accruals are negatively correlated with contemporaneous stock returns (Section 4). We therefore follow Nelson and Kim (1993) and Pontiff and Schall (1998) to use a randomization procedure to generate empirical p-values ("randomization p-values") for the coefficients on aggregate accruals, aggregate cash flows, and other return predictors that account for the potential bias.

More specifically, we simulate artificial series of returns and the independent variable under the null of no predictability by randomly drawing without replacement of the residual pairs from the return predictive regression and a first-order autoregression of the independent variable (the starting value of the simulation is randomly drawn from the unconditional distribution of the independent variable). This way, the simulated data series preserve the time series properties of the original data. We then regress the simulated returns on the simulated series of the independent variable to produce a slope estimate. This procedure is repeated 5,000 times to create an empirical distribution of the slope coefficient

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[8] Some firm-level studies (e.g., Teoh, Welch, and Wong, 1998) use a cross-sectional regression model to decompose accruals into "non-discretionary" (predicted, or normal) and "discretionary" (residual) components, and provide evidence of return predictability in the discretionary component. However, owing to time-series dynamics of accruals (which mechanically must reverse out in the long-run), it is even harder in the time series than in the cross-section to estimate an appropriate benchmark for predicted or normal accruals against which to measure discretionary accruals. In the interest of robustness, we therefore focus on the basic accruals variable, which at the firm level is a strong and reliable return predictor.

under the null of zero predictability. The randomization p-value is then the fraction of the 5,000 simulated slopes that are further away from zero than the actual slope estimate.[9]

Finally, to assess the economic significance of the return predictability associated with aggregate accruals, aggregate cash flows, and other return predictors, we also calculate bias-adjusted regression coefficients following Stambaugh (2000) and Kendall (1954). Stambaugh (2000) shows that in a general autoregressive framework:

$$R_t = \alpha + \beta X_{t-1} + u_t, \quad u \sim \text{i.i.d. N}(0, \sigma_u^2), \tag{1}$$

$$X_t = \mu + \phi X_{t-1} + v_t, \quad v \sim \text{i.i.d. N}(0, \sigma_v^2). \tag{2}$$

The bias in the OLS estimate of β in the return predictive regression (1) is proportional to the bias in the OLS estimate of ϕ in the first-order autoregression (2) for the return predictor X_t (e.g., aggregate accruals)

$$E(\hat{\beta} - \beta) = (\sigma_{uv}/\sigma_v^2)E(\hat{\phi} - \phi), \tag{3}$$

where the hats denote the OLS estimates. Furthermore, Kendall (1954) proves that the bias in the OLS estimate of ϕ is

$$E(\hat{\phi} - \phi) = -(1 + 3\phi)/n + O(n^{-2}), \tag{4}$$

where n is the sample size. Combining (3) and (4) allows us to calculate the bias-adjusted estimate of β in the return predictive regression using the following formula:

$$\beta_{adj.} = \hat{\beta} + (\hat{\sigma}_{uv}/\hat{\sigma}_v^2)(1 + 3\phi_{adj.})/n, \tag{5}$$

where $\hat{\sigma}_{uv}$ and $\hat{\sigma}_v^2$ are the sample covariance and variance of the OLS residuals from (1) and (2), and $\phi_{adj.} = (n\hat{\phi} + 1)/(n - 3)$ is the bias-adjusted estimate for ϕ.

2.3. Descriptive statistics

Table 1 reports the summary statistics (Panel A) of aggregate returns, aggregate accruals, aggregate cash flows, and other return predictors, as well as the correlations between them (Panel B). Panel A shows that the average annual return is 9.7% for the CRSP value-weighted index and 9.4% for the sample value-weighted portfolio, with standard deviations of 14.4% and 13.6% for the two portfolios, respectively, in line with findings from past research. Mean and median aggregate accruals are negative, reflecting the relative importance of depreciation over other items in accruals. The autocorrelations in Panel A also indicate that aggregate accruals and aggregate cash flows are slowly mean-reverting.

Panel B shows that aggregate accruals and aggregate cash flows are uncorrelated. This result provides an interesting contrast with the behavior of firm-level accruals and cash flows, and raises the possibility that accounting smoothing is less important at the aggregate level. For example, it is possible that accounting smooth-

ing occurs mainly in response to firm-specific shocks, and therefore tends to wash out in the aggregate. Furthermore, aggregate accruals is positively correlated with aggregate value metrics (E/P, BE/ME, and D/P), and aggregate cash flows is uncorrelated with E/P and BE/ME, and only weakly correlated with D/P. These correlations contrast with the negative correlations of accruals with these metrics at the firm level, and with the positive correlations of cash flows with these metrics at the firm level. Taken together, these findings suggest that aggregate accruals and cash flows may reflect a rather different set of forces from those that influence firm-level accruals and cash flows.

Panel B also shows that the correlation with one-year-ahead aggregate returns is large and positive (47% for the CRSP index and 51% for the sample portfolio) for aggregate accruals, and large and negative (−36% for the CRSP index and −40% for the sample portfolio) for aggregate cash flows. These results are quite different from the negative and positive cross-sectional relations between returns and firm-level accruals and cash flows, respectively. However, since aggregate accruals and to a lesser extent aggregate cash flows are correlated with other aggregate return predictors such as the dividend-to-price ratio, earnings-to-price ratio, book-to-market ratio, equity share in new issues, and term spread, we need to control for these variables in later tests to examine the marginal abilities of accruals and cash flows to predict aggregate returns.

3. Aggregate accruals and cash flows as predictors of future aggregate earnings and returns

Since the earnings fixation hypothesis for the firm-level accrual and cash flow effects is based upon the finding that earnings performance attributable to the accrual component of earnings is less persistent than earnings performance attributable to the cash flow component of earnings, in Section 3.1 we estimate the abilities of aggregate accruals versus aggregate cash flows to predict aggregate earnings performance. We then test the abilities of aggregate accruals and cash flows to predict aggregate stock returns in both univariate regressions (Section 3.2), and multivariate regressions after controlling for other return predictors from the literature (Section 3.3).

3.1. Persistence of aggregate earnings components

Table 2 describes regressions of one-year-ahead aggregate earnings on current earnings (Panel A), and on current accruals and cash flows (Panel B) for the entire 1965–2005 sample period.

Panel A indicates that aggregate earnings performance is highly persistent (slowly mean-reverting), with a regression coefficient of 0.848. In Panel B, consistent with the firm-level evidence in Sloan (1996), the cash flow component of aggregate earnings is a more positive predictor of future aggregate earnings than the accrual component of aggregate earnings (0.984 > 0.720). An F-test rejects the null that the coefficients are equal

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[9] Kothari and Shanken (1997) employ a slightly different boot-strapping procedure to estimate the empirical p-value. We have repeated our analyses following their approach and found the results are very similar. For brevity, they are not reported.

Table 1
Summary statistics for aggregate returns, accruals, cash flows, and other aggregate return predictors, 1965–2005

   The table reports the summary statistics for aggregate stock returns, aggregate accruals, aggregate cash flows, and other aggregate return predictors. CRSPRET is the annual return (with dividends) on the CRSP value-weighted index from May of year t to April of year $t+1$. SAMPLERET is the annual return on the value-weighted portfolio of the subsample of CRSP firms that have sufficient accounting information to calculate accruals and cash flows. Firm-level earnings is operating income after depreciation (Compustat #178). Accruals is the change in non-cash current assets (Compustat #4–Compustat #1) minus the change in current liabilities (5) excluding the change in short-term debt (34) and the change in taxes payable (71) minus depreciation and amortization expense (14). Cash flows is measured as the difference between earnings and accruals. Earnings, accruals, and cash flows are scaled by lagged total assets (Compustat #6). Earnings-to-price ratio is earnings divided by market capitalization at fiscal year end. Book-to-market ratio is book equity divided by market capitalization at fiscal year end. Book equity is stockholder's equity (216), plus balance sheet deferred tax and investment tax credit (35, if available), minus the book value of preferred stock [liquidating value (10) if available, or else redemption value (56) if available, or else carrying value (130)]. Individual firm-level accruals, earnings, cash flows, earnings-to-price ratio, and book-to-market ratio are then aggregated to the market level using market capitalization as the weight for NYSE/Amex/Nasdaq firms with fiscal year ending in December of year $t-1$. The aggregate variables are denoted ACCRUAL, EARNING, CASHFLOW, E/P, and BE/ME. D/P is the dividend-to-price ratio for the CRSP value-weighted index which equals total dividends accrued to the index from May of year $t-1$ to April of year t divided by the index level at the end of April of year t. ESHARE is the equity share of total equity and debt issues in year $t-1$, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield as of beginning of May of year t. TERM is the difference between ten- and one-year treasury constant maturity rates as of beginning of May of year t. TBILL is the 30-day T-bill rate as of beginning of May of year t..

Panel A. Summary statistics and autocorrelations

Name	Mean	Standard deviations	Q1	Median	Q3	Autocorrelations				
						1	2	3	4	5
CRSPRET	0.097	0.144	0.038	0.102	0.163	−0.07	0.15	−0.08	0.04	−0.08
SAMPLERET	0.094	0.136	0.042	0.088	0.174	−0.05	0.16	−0.06	0.06	−0.07
EARNING	0.155	0.024	0.135	0.152	0.177	0.83	0.61	0.49	0.44	0.40
ACCRUAL	−0.044	0.017	−0.050	−0.044	−0.038	0.50	0.29	0.19	0.13	0.15
CASHFLOW	0.199	0.017	0.185	0.199	0.216	0.61	0.41	0.35	0.25	0.17
E/P	0.155	0.062	0.102	0.127	0.200	0.82	0.69	0.65	0.56	0.43
BE/ME	0.648	0.227	0.467	0.578	0.825	0.87	0.75	0.73	0.65	0.50
D/P	0.030	0.011	0.024	0.029	0.037	0.89	0.82	0.74	0.65	0.54
ESHARE	0.187	0.088	0.121	0.163	0.220	0.69	0.50	0.32	0.24	0.12
DEF	0.010	0.004	0.007	0.009	0.012	0.60	0.45	0.30	0.27	0.29
TERM	0.010	0.011	0.002	0.008	0.017	0.43	0.12	−0.09	−0.18	0.02
TBILL	0.002	0.034	−0.007	0.006	0.021	−0.01	−0.22	0.29	0.24	0.06

Panel B. Correlations

	$SAMPLERET_{t+1}$	$EARNING_t$	$ACCRUAL_t$	$CASHFLOW_t$	E/P_t	BE/ME_t	D/P_t	$ESHARE_t$	DEF_t	$TERM_t$	$TBILL_t$
$CRSPRET_{t+1}$	0.98	0.08	0.47	−0.36	0.36	0.32	0.31	0.00	0.26	0.13	−0.18
$SAMPLERET_{t+1}$		0.08	0.51	−0.40	0.40	0.37	0.36	0.05	0.28	0.11	−0.20
$EARNING_t$			0.70	0.69	0.46	0.37	0.51	0.35	0.02	−0.60	0.16
$ACCRUAL_t$				−0.03	0.44	0.43	0.57	0.24	0.13	−0.32	0.09
$CASHFLOW_t$					0.03	0.00	0.14	0.25	−0.11	−0.52	0.13
E/P_t						0.97	0.87	0.36	0.68	−0.13	0.20
BE/ME_t							0.90	0.49	0.72	−0.07	0.23
D/P_t								0.57	0.59	−0.28	0.31
$ESHARE_t$									0.38	−0.31	0.21
DEF_t										0.09	0.10
$TERM_t$											−0.07

($F = 2.68$, $p = 0.055$) in a one-sided test (relevant when the alternative hypothesis is higher level of persistence for cash flows than for accruals under the earnings fixation hypothesis at the aggregate level). The difference between the two coefficients (0.264) is quite large, about three times the coefficient difference (0.090) from the firm-level tests in Sloan (1996).

   Based on this evidence that the cash flow component of aggregate earnings is more persistent that the accrual component of earnings, the earnings fixation hypothesis implies that aggregate accruals should negatively predict aggregate stock returns, and aggregate cash flows should positively predict returns. We explore this prediction in the next two subsections.

3.2. Forecasting aggregate returns: univariate tests

   Table 3 describes univariate regressions of one-year-ahead aggregate stock returns on aggregate accruals (ACCRUAL, Panel A), aggregate cash flows (CASHFLOW, Panel B), and a number of other possible aggregate return predictors: earnings (EARNING, Panel C), earnings-to-price ratio (E/P, Panel D), book-to-market ratio (BE/ME, Panel E), equity share in new issues (ESHARE, Panel F), dividend-to-price ratio (D/P, Panel G), default premium (DEF, Panel H), term premium (TERM, Panel I), and short-term interest rate (TBILL, Panel J). All independent variables in the regressions are standardized to have zero mean and unit variance to make their coefficients comparable.

Table 2
Regressions of one-year-ahead aggregate earnings on current aggregate earnings, accruals, and cash flows, 1965–2005

The table reports the time series regressions of one-year-ahead aggregate earnings on current aggregate earnings (Panel A) and the accrual and cash flow components of aggregate earnings (Panel B). EARNING, ACCRUAL, and CASHFLOW are the value-weighted averages of firm-level scaled earnings, accruals, and cash flows, respectively. The F-stat in Panel B is for the null hypothesis that the earnings regression coefficient on ACCRUAL is equal to the coefficient on CASHFLOW.

Panel A. $EARNING_{t+1} = \alpha + \beta\ EARNING_t + v_{t+1}$

α	$t(\alpha)$	β	$t(\beta)$	Adj-R^2 (%)
0.023	1.69	0.848	9.96	72

Panel B. $EARNING_{t+1} = \alpha + \beta_1 ACCRUAL_t + \beta_2\ CASHFLOW_t + v_{t+1}$

α	$t(\alpha)$	β_1	$t(\beta_1)$	β_2	$t(\beta_2)$	Adj-R^2 (%)
−0.010	−0.43	0.720	6.32	0.984	8.36	73
			$F(\beta_1 = \beta_2) = 2.68$, p-value $= 0.055$			

Table 3
Univariate regressions of one-year-ahead aggregate returns on current aggregate accruals, cash flows, and other aggregate return predictors, 1965–2005

The table reports the time series regressions of one-year-ahead aggregate stock returns on aggregate accruals, aggregate cash flows, and other aggregate return predictors. R_{t+1} is the annual return on the CRSP value-weighted index (CRSPRET) or the value-weighted portfolio of CRSP firms that have sufficient accounting information to calculate accruals and cash flows (SAMPLERET). ACCRUAL, CASHFLOW, EARNING, E/P, and BE/ME are the value-weighted averages of firm-level scaled accruals, cash flows, earnings, earnings-to-price ratio, and book-to-market ratio, respectively. D/P is the dividend-to-price ratio for the CRSP value-weighted index. ESHARE is the equity share of total equity and debt issues, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield. TERM is the difference between ten- and one-year treasury constant maturity rates. TBILL is the 30-day T-bill rate. All independent variables are standardized to have zero mean and unit variance. Randomization p-values are calculated following Nelson and Kim (1993), and bias-adjusted betas are calculated following Stambaugh (2000) and Kendall (1954).

Returns	α	$t(\alpha)$	β	$t(\beta)$	Rand. p	Adj-β	Adj-R^2 (%)
Panel A. $R_{t+1} = \alpha + \beta\ ACCRUAL_t + v_{t+1}$							
CRSPRET	0.097	4.83	0.068	3.33	0.002	0.065	20
SAMPLERET	0.094	5.05	0.069	3.67	0.001	0.066	24
Panel B. $R_{t+1} = \alpha + \beta\ CASHFLOW_t + v_{t+1}$							
CRSPRET	0.097	4.57	−0.052	−2.42	0.014	−0.051	11
SAMPLERET	0.094	4.76	−0.055	−2.75	0.006	−0.055	14
Panel C. $R_{t+1} = \alpha + \beta\ EARNING_t + v_{t+1}$							
CRSPRET	0.097	4.28	0.012	0.52	0.397	0.005	−2
SAMPLERET	0.094	4.37	0.011	0.50	0.412	0.004	−2
Panel D. $R_{t+1} = \alpha + \beta\ E/P_t + v_{t+1}$							
CRSPRET	0.097	4.56	0.051	2.38	0.058	0.042	10
SAMPLERET	0.094	4.74	0.054	2.69	0.035	0.046	14
Panel E. $R_{t+1} = \alpha + \beta\ BE/ME_t + v_{t+1}$							
CRSPRET	0.097	4.49	0.045	2.07	0.091	0.033	8
SAMPLERET	0.094	4.68	0.050	2.46	0.057	0.039	11
Panel F. $R_{t+1} = \alpha + \beta\ ESHARE_t + v_{t+1}$							
CRSPRET	0.097	4.26	−0.000	−0.02	0.463	−0.003	−3
SAMPLERET	0.094	4.36	0.007	0.34	0.420	0.004	−2
Panel G. $R_{t+1} = \alpha + \beta\ D/P_t + v_{t+1}$							
CRSPRET	0.097	4.49	0.045	2.06	0.279	0.021	8
SAMPLERET	0.094	4.66	0.049	2.41	0.221	0.026	11
Panel H. $R_{t+1} = \alpha + \beta\ DEF_t + v_{t+1}$							
CRSPRET	0.097	4.41	0.037	1.65	0.085	0.034	4
SAMPLERET	0.094	4.53	0.038	1.79	0.066	0.035	5
Panel I. $R_{t+1} = \alpha + \beta\ TERM_t + v_{t+1}$							
CRSPRET	0.097	4.30	0.019	0.85	0.218	0.018	−1
SAMPLERET	0.094	4.38	0.016	0.72	0.255	0.015	−1
Panel J. $R_{t+1} = \alpha + \beta\ TBILL_t + v_{t+1}$							
CRSPRET	0.097	4.33	−0.025	−1.11	0.133	−0.025	1
SAMPLERET	0.094	4.44	−0.027	−1.26	0.106	−0.026	1

In Panel A, contrary to the earnings fixation hypothesis which predicts a negative relation between aggregate accruals and future aggregate stock returns, we find that ACCRUAL is a strong positive predictor of stock returns, with an OLS point estimate of 0.068 ($t = 3.33$) using the CRSP value-weighted index (CRSPRET) and 0.069 ($t = 3.67$) using the sample value-weighted portfolio (SAMPLERET), and a regression adjusted R^2 of 20% and 24% for the two portfolios, respectively. Since ACCRUAL is standardized to have zero mean and unit variance, the regression coefficients imply that a one standard deviation increase in ACCRUAL predicts close to 7% higher aggregate stock returns. Thus, the magnitude of the effect is quite substantial.

To address the potential small-sample bias in the OLS point estimates, we report *p*-values based on the bootstrapping randomization procedure of Nelson and Kim (1993). The results confirm that the return predictability of ACCRUAL is highly significant. The randomization *p*-value is 0.2% for CRSPRET and 0.1% for SAMPLERET. Furthermore, the biased-adjusted regression coefficients on ACCRUAL calculated following Stambaugh (2000) and Kendall (1954) are virtually identical to the OLS point estimates, 0.065 for CRSPRET and 0.066 for SAMPLERET.

The value-weighted portfolios place greater weights on large firms than small firms. We also perform return predictability tests using equal-weighted returns and equal-weighted aggregate accruals (results not reported in tables). We find economically and statistically significant predictability using both value-weighted and equal-weighted returns. Interestingly, there is significant cross-predictability, wherein value-weighted accruals significantly predicts equal-weighted returns, and equal-weighted accruals significantly predicts value-weighted returns.

Overall, results using value-weighted accruals as a predictor (of either value-weighted or equal-weighted returns) is stronger and more robust than using equal-weighted accruals as a predictor. Indeed, though the point estimate of the effect is non-negligible, equal-weighted accruals is not statistically significant as a predictor of equal-weighted aggregate returns (but is significant as a predictor of value-weighted aggregate returns). These findings indicate that the accruals of larger firms are especially important for predicting aggregate stock returns.

The earnings fixation hypothesis at the aggregate level also suggests that cash flows should positively predict returns. Panel B of Table 3 shows that, contrary to the prediction of the earnings fixation hypothesis, CASHFLOW is a significant negative predictor of aggregate returns, with a regression coefficient of −0.052 (randomization $p = 1.4\%$) for CRSPRET and −0.055 (randomization $p = 0.6\%$) for SAMPLERET. This effect is almost as strong in the negative direction as the accrual effect is in the positive direction.

The rest of Table 3 describes univariate regressions of aggregate returns on aggregate earnings, earnings-to-price ratio, book-to-market ratio, equity share, dividend-to-price ratio, default spread, term spread, and short-term interest rate. The predictive powers of most of these variables are fairly weak. The strongest, E/P (Panel D), is a positive return predictor, with a randomization *p*-value of 5.8% for CRSPRET and 3.5% for SAMPLERET. BE/ME (Panel E) and DEF (Panel H) produce somewhat weaker evidence of positive predictability with randomization *p*-values ranging from 5.7% to 9.1%. None of the other variables is a statistically significant return predictor.

Finally, for most of the variables, the bias-adjusted regression coefficients are fairly close to the OLS point estimates. However, for D/P and to a lesser extent BE/ME the bias adjustment reduces the size of the coefficients substantially, indicating that the OLS estimates overstate the predictive powers of these two variables.

In summary, Table 3 demonstrates that the relations between accruals, cash flows, and subsequent returns at the aggregate level is in sharp contrast with the strong negative (accruals) and positive (cash flows) firm-level relations identified in past research. The level of accruals is a positive and economically important predictor of aggregate stock returns, and the level of cash flows is a strong negative predictor.

As suggested in the introduction, much of the earnings management that firms do may be averaged away at the aggregate level. For example, firms may manage earnings in order to offset firm-specific shocks, or to avoid falling behind industry peers. If firms manage earnings upward at times of adverse shocks, then they will later need to "pay back" their incremental earnings through the reversal of accruals. If such behaviors tend to average out in the aggregate, the behavioral effect operating at the firm level may be washed out when aggregating across firms. This argument can potentially explain a failure of aggregate accruals and cash flows to predict aggregate stock returns, but cannot explain the strong return predictability we observe. In Section 4, we explore whether shifts in market discount rates can explain the puzzle by examining the contemporaneous relations between accrual innovations, cash flow innovations, aggregate stock returns, and discount rate proxies.

3.3. Forecasting aggregate returns: multivariate tests

To see whether the levels of aggregate accruals and aggregate cash flows have incremental power to predict aggregate stock returns after controlling for other aggregate return predictors, we employ multivariate tests in Table 4. Many of the aggregate return predictors from past literature contain market prices, and are therefore potentially proxies for either misvaluation or rational discount rates. Thus, these controls can confound tests between behavioral versus rational hypotheses. However, such tests do verify whether the abilities of accruals and cash flows to predict aggregate returns is distinct from those associated with the variables identified in past literature.

Table 4, Panel A describes the multivariate regression of one-year-ahead aggregate returns on ACCRUAL, CASHFLOW, and six other control variables. As in the univariate regression and in sharp contrast to past firm-level findings, ACCRUAL is a significant positive predictor of

Table 4

Multivariate regressions of one-year-ahead aggregate returns on current aggregate accruals, cash flows, and other aggregate return predictors, 1965–2005

The table reports the time series regressions of one-year-ahead aggregate stock returns on aggregate accruals, aggregate cash flows, and other aggregate return predictors. R_{t+1} is the annual return on the CRSP value-weighted index (CRSPRET) or the value-weighted portfolio of CRSP firms that have sufficient accounting information to calculate accruals and cash flows (SAMPLERET). ACCRUAL, CASHFLOW, E/P, and BE/ME are the value-weighted averages of firm-level scaled accruals, cash flows, earnings-to-price ratio, and book-to-market ratio, respectively. D/P is the dividend-to-price ratio for the CRSP value-weighted index. ESHARE is the equity share of total equity and debt issues, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield. TERM is the difference between ten- and one-year treasury constant maturity rates. TBILL is the 30-day T-bill rate. All independent variables are standardized to have zero mean and unit variance. Randomization p-values are calculated following Nelson and Kim (1993).

Panel A. $R_{t+1} = \alpha + \beta_1 ACCRUAL_t + \beta_2\ CASHFLOW_t + \beta_3 BE/ME_t + \beta_4\ ESHARE_t + \beta_5\ D/P_t + \beta_6\ DEF_t + \beta_7\ TERM_t + \beta_8\ TBILL_t + v_{t+1}$

Returns		α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	Adj-R^2 (%)
CRSPRET	Coefficients	0.097	0.058	−0.035	−0.025	−0.017	0.057	0.018	0.024	−0.034	30
	t-statistics	*5.01*	*2.17*	*−1.40*	*−0.44*	*−0.70*	*0.95*	*0.59*	*0.91*	*−1.64*	
	Rand. *p*	–	0.010	0.127	0.252	0.163	0.238	0.181	0.211	0.026	
SAMPLERET	Coefficients	0.094	0.054	−0.044	−0.012	−0.008	0.050	0.010	0.017	−0.038	39
	t-statistics	*5.50*	*2.28*	*−2.01*	*−0.24*	*−0.37*	*0.95*	*0.36*	*0.71*	*−2.01*	
	Rand. *p*	–	0.006	0.051	0.352	0.248	0.238	0.281	0.283	0.010	

Panel B. $R_{t+1} = \alpha + \beta_1\ ACCRUAL_t + \beta_2\ E/P_t + \beta_3\ BE/ME_t + \beta_4\ ESHARE_t + \beta_5\ D/P_t + \beta_6\ DEF_t + \beta_7\ TERM_t + \beta_8\ TBILL_t + v_{t+1}$

Returns		α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	Adj-R^2 (%)
CRSPRET	Coefficients	0.097	0.072	0.195	−0.225	0.020	0.043	0.023	0.065	−0.034	32
	t-statistics	*5.00*	*2.85*	*1.80*	*−1.77*	*0.61*	*0.74*	*0.77*	*2.48*	*−1.61*	
	Rand. *p*	–	0.001	0.002	0.001	0.257	0.396	0.150	0.001	0.027	
SAMPLERET	Coefficients	0.094	0.070	0.154	−0.167	0.020	0.034	0.016	0.058	−0.037	36
	t-statistics	*5.26*	*3.00*	*1.54*	*−1.42*	*0.66*	*0.63*	*0.57*	*2.37*	*−1.96*	
	Rand. *p*	–	0.000	0.005	0.002	0.249	0.453	0.213	0.002	0.011	

aggregate returns. This result again contradicts the prediction of the earnings fixation hypothesis. The coefficient on ACCRUAL is 0.058 for CRSPRET and 0.054 for SAMPLERET and is highly significant in both statistical (randomization *p* of 1.0% for CRSPRET and 0.6% for SAMPLERET) and economic terms (for example, a one standard deviation increase in ACCRUAL is associated with an increase of 5.8% in CRSPRET next year).

These coefficients are only slightly lower than the univariate regression coefficients on ACCRUAL (0.068 for CRSPRET and 0.069 for SAMPLERET) from Table 3, suggesting that the inclusion of CASHFLOW and other controls has little effect on the ability of ACCRUAL to predict returns. On the other hand, the regression adjusted R^2s of 30% (CRSPRET) and 39% (SAMPLERET) are higher than those from the univariate regressions on ACCRUAL (20% and 24%, respectively), suggesting that CASHFLOW and other control variables do add further explanatory power to the regression.

Also consistent with the univariate regressions but contrary to the prediction of the earnings fixation hypothesis, CASHFLOW is a marginally significant negative predictor (randomization *p* of 12.7% for CRSPRET and 5.1% for SAMPLERET). The point estimates indicate that the economic magnitude of this effect is still substantial; a one standard deviation increase in CASHFLOW is associated with a 3.5% (CRSPRET) or 4.4% (SAMPLERET) reduction in next year's aggregate stock return.

Since EARNING is the sum of ACCRUAL and CASHFLOW, Panel A is econometrically equivalent to a regression in which returns are regressed on ACCRUAL and EARNING.[10] In untabulated results, we find that in such a regression, ACCRUAL is still a significant positive predictor of aggregate returns (randomization *p* of 0.0% for both CRSPRET and SAMPLERET). Indeed, the economic magnitude of the marginal ACCRUAL effect in this regression is even larger: a one standard deviation increase in ACCRUAL is associated with a 9.3% (CRSPRET) or 9.8% (SAMPLERET) increase in next year's aggregate stock return.

Table 4, Panel B replaces CASHFLOW with E/P in the multivariate regression. ACCRUAL remains a highly significant positive predictor of aggregate stock returns (randomization *p* of 0.1% for CRSPRET and 0.0% for SAMPLERET). The regression coefficients on ACCRUAL indicate that a one standard deviation increase in ACCRUAL predicts 7.2% (CRSPRET) or 7.0% (SAMPLERET) higher aggregate returns next year.

4. Contemporaneous relations between innovations in aggregate accruals, innovations in aggregate cash flows, and aggregate stock returns

In an efficient market, a high market discount rate implies a high expected stock return. So a possible

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[10] Since EARNING, ACCRUAL, and CASHFLOW are standardized to have zero mean and unit variance in the return regressions, we cannot directly infer the coefficients on ACCRUAL and EARNING in the alternative regression—an adjustment for standard deviations is needed.

explanation for the positive relation between aggregate accruals and future stock returns and the negative relationship between aggregate cash flows and future returns is that contemporaneously the level of accruals is positively associated with the market discount rate and the level of cash flows is negatively associated with the discount rate.

Ceteris paribus, a rise in the discount rate causes a decline in the stock market. This suggests that a way to test whether the level of accruals is indeed positively correlated with the discount rate is to examine whether accrual innovations are negatively contemporaneously correlated with aggregate stock returns. Similarly, we can test whether the level of cash flows is negatively correlated with the discount rate by examining whether cash flow innovations are positively correlated with contemporaneous aggregate returns. However, accrual and cash flow innovations contain news not just about discount rates, but about expected cash flows as well.[11]

We expect positive innovations in aggregate accruals and cash flows to both contain favorable cash flow news (although the cash flow news in accruals is not necessarily as favorable as that in cash flows); Wilson (1986) provides evidence at the firm level that this is indeed the case. If a positive innovation in aggregate accruals is associated with heavier discounting of future cash flows, and if the discounting effect dominates the cash flow news in accruals, then the contemporaneous relation between accrual innovations and aggregate stock returns should be negative.[12] Similarly, a necessary condition for a positive innovation in aggregate cash flows to be associated with weaker discounting is that cash flow innovations and aggregate returns be positively contemporaneously correlated.

We calculate innovations in aggregate accruals and cash flows in three different ways, referred to as "Change," "Innovation 1," and "Innovation 2." The first one simply measures innovation as the change relative to the value the year before.[13] However, if accruals or cash flows does not follow a random walk, then using the first difference to measure innovation could be misspecified. To address this possibility, we use an AR1 model to remove the component of the accrual or cash flow change that is predictable based upon past changes. "Innovation 1" is then the forecast error from the AR1 model. For "Innovation 2," we add a single lag of the annual market return to the AR1 model. This allows for the possibility that the changes in accruals or cash flows are predictable using past returns. For consistency, similar measures of innovation are created for other return predictors.

We first examine the contemporaneous relation between accrual innovations and aggregate returns using univariate regressions. Table 5, Panel A reports the regression results. Consistent with a positive relation between the level of aggregate accruals and heavier discounting of future cash flows, changes in ACCRUAL are strongly negatively correlated with contemporaneous aggregate stock returns, with a regression coefficient of −0.066 ($t = -3.17$) for CRSPRET and −0.063 ($t = -3.22$) for SAMPLERET. The adjusted R^2 is 19% for both regressions. The negative relation remains strong and statistically significant when we use the two alternative innovation measures. The point estimates and t-statistics go down somewhat, likely due to the noise in estimating an AR1 model using a limited number of observations.

In Panel B, we see that changes in CASHFLOW are positively (although only marginally significantly) related to contemporaneous returns. The regression coefficient is 0.046 ($t = 1.72$) for CRSPRET and 0.048 ($t = 1.89$) for SAMPLERET. This finding is consistent with the hypothesis that cash flow innovations are associated with weaker discounting of future cash flows.

Panel C reports that innovations in EARNING are negatively associated with contemporaneous returns, which confirms the finding in Kothari, Lewellen, and Warner (2006). The results in Panels A and B suggest that the KLW finding derives largely from the accrual component of earnings surprises, with the cash flow component playing a dampening effect.

Panels D through J describe regressions for other return predictors. Regressions involving innovations in E/P, BE/ME, and D/P all produce sizeable coefficients and highly significant t-statistics. This is not surprising since these variables by virtually having price in the denominator should, for purely mechanical reasons, be correlated with contemporaneous stock returns.

Table 6 describes multivariate regressions of contemporaneous aggregate stock returns on innovations in ACCRUAL, CASHFLOW, and other return predictors. Under the rational risk interpretation for these controls, Table 6 examines the extent to which accrual and cash flow innovations affect aggregate stock returns after controlling for the relations between the innovations in those controls and aggregate returns. We omit from the regressions the innovations in the three price-scaled variables (ΔE/P, ΔBE/ME, and ΔD/P) because of their mechanical relations with contemporaneous returns.

The multivariate findings are very similar to the univariate ones. For both CRSPRET and SAMPLERET, incrementally changes in ACCRUAL have a strong negative relation with contemporaneous stock returns, with a coefficient −0.087 ($t = -3.04$) for CRSPRET and −0.078 ($t = -2.94$) for SAMPLERET. This finding is again consistent with innovations in aggregate accruals being associated with heavier discounting of future cash flows. The coefficient on the change in CASHFLOW is insignificant after controlling for the changes in ACCRUAL and other return predictors. The results using the two alternative innovation measures are very similar to those using changes.

An econometrically equivalent regression (not reported) replaces the innovation in CASHFLOW with

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[11] From the Campbell and Shiller (1988) decomposition, we know that stock returns by definition must equal the sum of expected returns, cash flow news, and discount rate news. Kothari, Lewellen, and Warner (2006) address a related issue in their examination of the contemporaneous relation between aggregate earnings surprises and market returns.

[12] This argument also accommodates the possibility that lower market valuations are due to behavioral effects such as overly pessimistic expectations about future cash flows.

[13] It is standard in the literature to use the previous year's earnings as the benchmark against which to measure earnings surprises.

Table 5

Univariate regressions of aggregate returns on contemporaneous innovations in aggregate accruals, cash flows, and other aggregate return predictors, 1965–2005

The table reports the time series regressions of aggregate stock returns on contemporaneous innovations in aggregate accruals, aggregate cash flows, and other aggregate return predictors. R_t is the annual return on the CRSP value-weighted index (CRSPRET) or the value-weighted portfolio of CRSP firms that have sufficient accounting information to calculate accruals and cash flows (SAMPLERET). ACCRUAL, CASHFLOW, EARNING, E/P, and BE/ME are the value-weighted averages of firm-level scaled accruals, cash flows, earnings, earnings-to-price ratio, and book-to-market ratio, respectively. D/P is the dividend-to-price ratio for the CRSP value-weighted index. ESHARE is the equity share of total equity and debt issues, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield. TERM is the difference between ten- and one-year treasury constant maturity rates. TBILL is the 30-day T-bill rate. "Change" is the change relative to the value the year before. "Innovation 1" is the forecast error from an AR1 model. "Innovation 2" is the forecast error from an augmented AR1 model where lagged market return is added as an additional regressor.

Returns	Change					Innovation 1			Innovation 2		
	α	$t(\alpha)$	β	$t(\beta)$	Adj-R^2 (%)	β	$t(\beta)$	Adj-R^2 (%)	β	$t(\beta)$	Adj-R^2 (%)
Panel A. $R_t = \alpha + \beta\ \Delta ACCRUAL_t + v_t$											
CRSPRET	0.096	4.65	−0.066	−3.17	19	−0.055	−2.38	11	−0.056	−2.23	10
SAMPLERET	0.094	4.78	−0.063	−3.22	19	−0.052	−2.39	11	−0.052	−2.20	9
Panel B. $R_t = \alpha + \beta\ \Delta CASHFLOW_t + v_t$											
CRSPRET	0.099	4.41	0.046	1.72	5	0.033	1.09	1	0.036	1.11	1
SAMPLERET	0.097	4.56	0.048	1.89	6	0.035	1.23	1	0.038	1.23	1
Panel C. $R_t = \alpha + \beta\ \Delta EARNING_t + v_t$											
CRSPRET	0.093	4.18	−0.083	−2.04	8	−0.090	−2.12	8	−0.090	−2.11	8
SAMPLERET	0.091	4.27	−0.074	−1.90	6	−0.079	−1.94	7	−0.079	−1.93	7
Panel D. $R_t = \alpha + \beta\ \Delta E/P_t + v_t$											
CRSPRET	0.097	4.80	−0.131	−3.62	24	−0.125	−3.31	21	−0.141	−3.46	22
SAMPLERET	0.094	4.84	−0.118	−3.38	21	−0.112	−3.07	18	−0.124	−3.14	19
Panel E. $R_t = \alpha + \beta\ \Delta BE/ME_t + v_t$											
CRSPRET	0.096	4.83	−0.156	−3.75	25	−0.151	−3.53	23	−0.180	−3.85	27
SAMPLERET	0.094	4.92	−0.145	−3.65	24	−0.140	−3.44	22	−0.166	−3.70	25
Panel F. $R_t = \alpha + \beta\ \Delta ESHARE_t + v_t$											
CRSPRET	0.095	4.13	−0.033	−1.10	1	−0.043	−1.35	2	−0.043	−1.22	1
SAMPLERET	0.092	4.26	−0.039	−1.35	2	−0.049	−1.63	4	−0.051	−1.54	3
Panel G. $R_t = \alpha + \beta\ \Delta D/P_t + v_t$											
CRSPRET	0.091	7.46	−0.269	−10.02	72	−0.269	−8.35	64	−0.260	−7.51	59
SAMPLERET	0.089	7.38	−0.252	−9.48	70	−0.251	−7.98	62	−0.242	−7.19	57
Panel H. $R_t = \alpha + \beta\ \Delta DEF_t + v_t$											
CRSPRET	0.098	4.44	−0.054	−2.12	8	−0.040	−1.41	3	−0.040	−1.39	2
SAMPLERET	0.095	4.55	−0.052	−2.12	8	−0.040	−1.50	3	−0.040	−1.48	3
Panel I. $R_t = \alpha + \beta\ \Delta TERM_t + v_t$											
CRSPRET	0.097	4.20	−0.022	−1.02	0	−0.016	−0.70	−1	−0.017	−0.73	−1
SAMPLERET	0.094	4.29	−0.018	−0.86	−1	−0.014	−0.62	−2	−0.014	−0.66	−2
Panel J. $R_t = \alpha + \beta\ \Delta TBILL_t + v_t$											
CRSPRET	0.096	4.21	0.019	1.16	1	0.012	0.68	−1	0.012	0.68	−1
SAMPLERET	0.094	4.39	0.025	1.63	4	0.018	1.03	0	0.018	1.03	0

innovation in EARNING on the right-hand side. We find that in this alternative regression, the innovation in ACCRUAL is still negatively and significantly related to aggregate returns. On the other hand, the coefficient on the EARNING innovation is insignificant, which confirms our earlier finding that the negative relation between earnings surprises and contemporaneous market returns first shown by Kothari, Lewellen, and Warner (2006) is driven by the innovations in aggregate accruals.

Overall, the evidence from Tables 5 and 6 is consistent with positive innovations in aggregate accruals or negative innovations in cash flows being associated with heavier market discounting of future cash flows, which leads to contemporaneous downward price adjustments and higher future returns. However, the heavier market discounting of the future that is associated with positive accrual or negative cash flow innovations is not captured by the standard discount rate proxies we employed in the multivariate tests. As discussed in footnote 6, an association between innovations in aggregate accruals or cash flows and shifts in discount rates is not the only possible explanation for the contemporaneous relation between accrual or cash flow innovations and aggregate stock returns. Furthermore, heavier market discounting can

Table 6
Multivariate regressions of aggregate returns on contemporaneous innovations in aggregate accruals, cash flows, and other aggregate return predictors, 1965–2005

The table reports the time series regressions of aggregate stock returns on contemporaneous innovations in aggregate accruals, aggregate cash flows, and other aggregate stock return predictors. R_t is the annual return on the CRSP value-weighted index (CRSPRET) or the value-weighted portfolio of CRSP firms that have sufficient accounting information to calculate accruals and cash flows (SAMPLERET). ACCRUAL and CASHFLOW are the value-weighted averages of firm-level scaled accruals and cash flows, respectively. ESHARE is the equity share of total equity and debt issues, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield. TERM is the difference between ten- and one-year treasury constant maturity rates. TBILL is the 30-day T-bill rate. "Change" is the change relative to the value the year before. "Innovation 1" is the forecast error from an AR1 model. "Innovation 2" is the forecast error from an augmented AR1 model where lagged market return is added as an additional regressor.

$R_t = \alpha + \beta_1\ \Delta ACCRUAL_t + \beta_2\ \Delta CASHFLOW_t + \beta_3\ \Delta ESHARE_t + \beta_4\ \Delta DEF_t + \beta_5\ \Delta TERM_t + \beta_6\ \Delta TBILL_t + v_t$

Returns		α	β_1	β_2	β_3	β_4	β_5	β_6	Adj-R^2 (%)
Change									
CRSPRET	Coefficients	0.093	−0.087	−0.032	−0.072	−0.041	−0.020	0.003	29
	t-statistics	*4.76*	*−3.04*	*−0.94*	*−2.60*	*−1.46*	*−0.84*	*0.17*	
SAMPLERET	Coefficients	0.091	−0.078	−0.024	−0.073	−0.041	−0.014	0.008	33
	t-statistics	*5.02*	*−2.94*	*−0.75*	*−2.84*	*−1.59*	*−0.67*	*0.61*	
Innovation 1									
CRSPRET	Coefficients	0.097	−0.085	−0.036	−0.080	−0.029	−0.029	−0.006	19
	t-statistics	*4.56*	*−2.77*	*−0.93*	*−2.55*	*−0.96*	*−1.13*	*−0.34*	
SAMPLERET	Coefficients	0.095	−0.077	−0.028	−0.082	−0.032	−0.023	−0.001	22
	t-statistics	*4.78*	*−2.68*	*−0.80*	*−2.81*	*−1.13*	*−0.98*	*−0.05*	
Innovation 2									
CRSPRET	Coefficients	0.097	−0.076	−0.027	−0.071	−0.025	−0.030	−0.006	11
	t-statistics	*4.36*	*−2.33*	*−0.66*	*−1.97*	*−0.80*	*−1.11*	*−0.31*	
SAMPLERET	Coefficients	0.095	−0.067	−0.021	−0.075	−0.029	−0.024	−0.001	14
	t-statistics	*4.56*	*−2.20*	*−0.56*	*−2.24*	*−0.99*	*−0.96*	*−0.02*	

occur for either rational or irrational reasons. In the conclusion of the paper, we discuss possible rational and behavioral interpretations of our findings.

5. Sector- and industry-level evidence

The striking contrast between firm- and aggregate-level evidence suggests that to gain further insight into the validity of the earnings fixation theory, it is important to explore the abilities of accruals and cash flows to predict earnings and returns at the sector and industry levels.

5.1. Forecasting sector-level earnings and returns

We classify firms into five sectors based on their Standard Industrial Classification (SIC) codes using the definitions downloaded from Ken French's Web site. Panel A of Table 7 describes the earnings persistence tests using sector-level value-weighted earnings (EARNING), accruals (ACCRUAL), and cash flows (CASHFLOW).

For four of the five sectors, the earnings regression coefficient on CASHFLOW is bigger than that on ACCRUAL. The exception is the High Tech sector, for which the ACCRUAL coefficient (0.865) is greater than the CASH-FLOW coefficient (0.754), although the difference is not

statistically significant according to the one-sided *F*-test for the null that the CASHFLOW coefficient is equal to the ACCRUAL coefficient ($p = 79.0\%$).

Among the four sectors for which the ACCRUAL coefficient is smaller than the CASHFLOW coefficient, two of them (Consumer and Manufacturing) produce coefficients that are statistically different from one another (the *F*-test for coefficient equality generates a *p*-value of 2.3% for Consumer and 1.7% for Manufacturing), suggesting that the cash flow component of earnings is more persistent than the accrual component of earnings for these two sectors. In addition, the magnitudes of the coefficient differences (0.245 for Consumer and 0.433 for Manufacturing) are about two and one-half to four and one-half times larger than that from the firm-level study (0.090) in Sloan (1996). Thus, the earnings fixation hypothesis implies that accruals should negatively predict returns and cash flows should positively predict returns in these two sectors. On the other hand, for the other three sectors where the coefficient differences are not statistically significant, the earnings fixation hypothesis predicts that neither accruals nor cash flows should significantly predict sector-level returns.

Panel B of Table 7 describes multivariate regressions of one-year-ahead value-weighted sector returns on sector-level ACCRUAL, CASHFLOW, BE/ME, D/P, and several aggregate return predictors including ESHARE, DEF, TERM,

Table 7

Regressions of one-year-ahead sector-level earnings and returns on current sector-level accruals and cash flows, 1965–2005

Panel A reports the time series regressions of one-year-ahead sector-level earnings on current sector-level accruals and cash flows. The five sectors are classified based on SIC codes using definitions downloaded from Ken French's Web site. EARNING, ACCRUAL, and CASHFLOW are the value-weighted averages of firm-level scaled earnings, accruals, and cash flows, respectively. p (F) is the p-value for the F-test that the earnings regression coefficient on ACCRUAL is equal to the coefficient on CASHFLOW. Panel B reports the time series regressions of one-year-ahead sector-level returns on sector-level accruals, cash flows, and other return predictors. R_{t+1} is the annual value-weighted sector return. BE/ME is the value-weighted average of firm-level book-to-market ratio. D/P is the dividend-to-price ratio for the value-weighted sector portfolio. ESHARE is the equity share of total equity and debt issues, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield. TERM is the difference between ten- and one-year treasury constant maturity rates. TBILL is the 30-day T-bill rate. All independent variables in the return regressions are standardized to have zero mean and unit variance. Randomization p-values are calculated following Nelson and Kim (1993). The last row of each panel reports pooled regressions across sectors.

Sector	Panel A. $EARNING_{t+1} = \alpha + \beta_1\ ACCRUAL_t + \beta_2\ CASHFLOW_t + v_{t+1}$								Panel B. $R_{t+1} = \alpha + \beta_1 ACCRUAL_t + \beta_2\ CASHFLOW_t + \beta_3 BE/ME_t + \beta_4\ ESHARE_t + \beta_5\ D/P_t + \beta_6\ DEF_t + \beta_7\ TERM_t + \beta_8\ TBILL_t + v_{t+1}$				
	Earnings regressions								Return regressions				
	α	$t(\alpha)$	β_1	$t(\beta_1)$	β_2	$t(\beta_1)$	$p(F)$	Adj-R^2 (%)	β_1	Rand. p	β_2	Rand. p	Adj-R^2 (%)
Consumer	0.083	3.44	0.258	1.69	0.503	3.85	0.023	27	−0.027	0.300	−0.034	0.228	8
Manufacturing	−0.022	−0.92	0.508	3.00	0.941	8.63	0.017	72	0.034	0.042	−0.023	0.186	31
High Tech	0.046	1.98	0.865	6.14	0.754	6.66	0.790	59	0.156	0.000	0.098	0.001	25
Health	0.006	0.27	0.880	10.46	0.959	9.24	0.239	79	−0.069	0.036	−0.097	0.002	22
Other	0.046	2.69	0.633	4.54	0.639	5.09	0.473	38	0.105	0.011	0.076	0.053	9
Cross-sector	0.015	2.15	0.898	22.63	0.902	25.62	0.471	84	0.028	0.018	−0.003	0.408	15

and TBILL. The regressions mirror the aggregate-level regression in Table 4, Panel A except that whenever possible, sector-level variables are used as regressors. To conserve space, we only report the coefficients and randomization p-values for ACCRUAL and CASHFLOW, which are most relevant for the purpose of testing the earnings fixation hypothesis at the sector level.

The regression results show that the abilities of accruals and cash flows to predict returns is by far the strongest in the High Tech sector with a randomization p-value of 0.0% and 0.1% for the coefficients on ACCRUAL and CASHFLOW, respectively. The magnitude of the coefficients is also very large economically (0.156 and 0.098), indicating that a one standard deviation increase in ACCRUAL or CASHFLOW is associated with a 15.6% or 9.8%, respectively, increase in next year's return on the High Tech sector.[14] Since Panel A shows that there is no significant difference in the level of persistence between accruals and cash flows in the High Tech sector, this strong return predictability associated with accruals and cash flows is inconsistent with the prediction of the earnings fixation hypothesis.

For the Consumer and Manufacturing sectors in which accruals is significantly less persistent than cash flows, there is no indication of return predictability associated with ACCRUAL in the Consumer sector (randomization $p = 30.0\%$), and in the Manufacturing sector ACCRUAL predicts sector returns positively (randomization $p = 4.2\%$) instead of negatively as suggested by the

earnings fixation hypothesis. In addition, CASHFLOW does not predict returns in either sector. These results oppose the earnings fixation hypothesis.

For the Health sector, the earnings fixation hypothesis implies that neither accruals nor cash flows should predict returns since they do not demonstrate statistically different levels of persistence. Furthermore, if there were some differences in true persistence in accruals versus cash flows, the earnings fixation hypothesis implies that they would predict returns with the opposite signs. Inconsistent with the hypothesis, the regression results show that both variables predict sector returns negatively with sizeable coefficients (−0.069 for ACCRUAL and −0.097 for CASHFLOW) and significant p-values (3.6% for ACCRUAL and 0.2% for CASHFLOW).

According to the earnings fixation hypothesis, we also do not expect to see return predictability for accruals or cash flows in the Other sector, since we do not detect statistically different levels of persistence for the two variables. However, in the return regression, the coefficients on ACCRUAL and CASHFLOW are both quite large (0.105 and 0.076, respectively) and statistically significant (randomization p-values of 1.1% and 5.3%), indicating that a one standard deviation increase in ACCRUAL or CASHFLOW is associated with a 10.5% or 7.6% increase in subsequent sector returns, respectively.

In sum, the sector-specific return regression results are clearly inconsistent with the predictions of the earnings fixation hypothesis. On the other hand, it is intriguing to see that the sector in which accruals is most persistent relative to cash flows, High Tech, is also the sector in which the ability of accruals to predict returns is strongest and most positive relative to that of cash flows. This suggests that it may be worth exploring a weakened version of the earnings fixation hypothesis—that the relation between accruals and subsequent sector returns

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[14] Given the unusual events of the 1987 market crash and the burst of the Tech bubble at the turn of the millennium, we have re-estimated the regression for the High Tech sector excluding the observations for return years 1987 and 2000 (results not reported in tables). The coefficients on ACCRUAL and CASHFLOW both decline slightly but remain statistically highly significant.

is more negative (or less positive) in sectors in which accruals are less persistent relative to cash flows as a predictor of earnings performance. This hypothesis also suggests that in those sectors, cash flow should be a more positive (less negative) return predictor.

To examine this weakened version of the earnings fixation hypothesis, in untabulated analysis we divide the five sectors into two groups, those in which the earnings regression coefficient on ACCRUAL is smaller than that on CASHFLOW (Consumer, Manufacturing, Health, and Other), and those in which the ACCRUAL coefficient is bigger than the CASHFLOW coefficient (High Tech). For the first group, the average return regression coefficient on ACCRUAL is equal to 0.011, which is smaller than the return regression coefficient on ACCRUAL for High Tech (0.156), and an *F*-test easily rejects the null that the two coefficients are equal ($p = 0.2\%$). This result is consistent with the weakened earnings fixation hypothesis. On the other hand, the average return regression coefficient on CASHFLOW for the first group of four sectors (–0.020) is significantly smaller than the return regression coefficient on CASHFLOW for High Tech (0.098) with a *p*-value for the cross-equation *F*-test of 2.0%, opposing the weakened earnings fixation hypothesis. Therefore, the sector-level evidence provides only mixed support to the weakened version of the earnings fixation hypothesis.

Finally, instead of performing separate time series tests for each industry, we also perform tests of cross-sectional predictability of accruals and cash flows across sectors. The bottom row of Table 7 reports pooled regressions of earnings and returns on lagged accruals and cash flows across sectors.

In the earnings regression (Panel A), the coefficient on CASHFLOW (0.902) is only slightly higher than that on ACCRUAL (0.898), and an *F*-test cannot reject the null that the two coefficients are equal ($p = 47.1\%$). However, in the return regression (Panel B), ACCRUAL is a significant positive predictor of returns (coefficient = 0.028, $p = 1.8\%$), while CASHFLOW is an insignificant negative predictor (coefficient = –0.003, $p = 40.8\%$). Thus, as with the sector-specific findings, this evidence does not support the earnings fixation hypothesis (which predicts that neither accruals nor cash flows should predict returns).

5.2. Forecasting industry-level earnings and returns

For industry-level earnings persistence and return forecasting tests, we consider the 48 industries in Fama and French (1997). The industry classifications are downloaded from Ken French's Web site. Table 8, Panel A describes the industry-level earnings persistence tests using value-weighted earnings (EARNING), accruals (ACCRUAL), and cash flows (CASHFLOW) for each industry. The regression results show huge variation across industries in the relative persistence of accruals versus cash flows in forecasting earnings performance. For example, for Construction Materials the earnings regression coefficient on ACCRUAL is 0.397, about half the size of the coefficient on CASHFLOW (0.764), and an *F*-test rejects the null that the two coefficients are equal with a *p*-value of

1.2%. By way of contrast, for Lab Equipment the coefficient on ACCRUAL in the earnings regression (0.817) is much bigger than that on CASHFLOW (0.572), so the *F*-test cannot reject the null in favor of greater cash flow persistence ($p = 92.7\%$).

Panel B of Table 8 shows that the level of accruals is a significant positive predictor of industry returns in several industries including Construction Materials, Precious Metals, Business Services, and Computers, and a significant negative predictor of industry returns in several other industries including Beer/Liquor, Tobacco, Ships, and Communication, even after controlling for other industry- and aggregate-level return predictors in the multivariate regressions.[15] Most of these effects are also quite substantial in economic terms. For example, the coefficient on ACCRUAL is 0.141 (randomization $p = 0.2\%$) for Computers and –0.157 (randomization $p = 0.2\%$) for Beer/Liquor, indicating that a one standard deviation increase in ACCRUAL is associated with a 14.1% increase in next year's return for Computers or a 15.7% decrease in next year's return for Beer/Liquor.

The level of cash flows is also a significant return predictor in a number of industries. Table 8, Panel B shows that the coefficient on CASHFLOW is positive and significant for industries such as Agriculture, Construction Materials, Business Services, and Computers (many of which also see ACCRUAL having a significantly positive coefficient), and negative and significant for industries such as Candy/Soda, Beer/Liquor, Tobacco, and Drugs (some of which also see ACCRUAL having a significantly negative coefficient). For many of these industries, the coefficient is also highly significant in economic terms; for example, it is equal to 0.162 (randomization $p = 0.2\%$) for Computers and –0.171 (randomization $p = 0.1\%$) for Beer/Liquor, indicating that a one standard deviation increase in CASHFLOW is associated with a 16.2% increase in next year's return for Computers or a 17.1% decrease in next year's return for Beer/Liquor.

The earnings fixation hypothesis implies that the abilities of accruals and cash flows to predict returns in each industry should correspond to the difference in the level of persistence between the accrual and cash flow components of industry earnings. In particular, for industries in which the accrual component of earnings is less persistent than the cash flow component of earnings, accruals should predict returns negatively whereas cash flows should predict returns positively. On the other hand, for industries in which the accrual component of earnings is more persistent than the cash flow component of earnings, accruals should predict returns positively whereas cash flows should predict returns negatively.

Similar to our sector-level findings, our industry-level findings also do not offer much support to the earnings fixation hypothesis. In many industries, the return predictability associated with accruals and cash flows

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[15] Even if the earnings fixation hypothesis were, in general, valid, we would not necessarily expect it to hold for Banking, for which the meaning of accruals is very different from that for other industries. None of our conclusions here would be affected by omitting the Banking industry.

Table 8

Regressions of one-year-ahead industry-level earnings and returns on current industry-level accruals and cash flows, 1965–2005

Panel A reports the time series regressions of one-year-ahead industry-level earnings on current industry-level accruals and cash flows. The 48 industries are classified based on SIC codes using definitions downloaded from Ken French's Web site. EARNING, ACCRUAL, and CASHFLOW are the value-weighted averages of firm-level scaled earnings, accruals, and cash flows, respectively. $p(F)$ is the p-value for the F-test that the earnings regression coefficient on ACCRUAL is equal to the coefficient on CASHFLOW. Panel B reports the time series regressions of one-year-ahead industry-level returns on industry-level accruals, cash flows, and other return predictors. R_{t+1} is the annual value-weighted industry return. BE/ME is the value-weighted average of firm-level book-to-market ratio. D/P is the dividend-to-price ratio for the value-weighted industry portfolio. ESHARE is the equity share of total equity and debt issues, as in Baker and Wurgler (2000). DEF is the difference between Moody's Baa yield and Aaa yield. TERM is the difference between ten- and one-year treasury constant maturity rates. TBILL is the 30-day T-bill rate. All independent variables in the return regressions are standardized to have zero mean and unit variance. Randomization p-values are calculated following Nelson and Kim (1993). The last row of each panel reports pooled regressions across industries.

Industry	Panel A. $EARNING_{t+1} = \alpha + \beta_1 ACCRUAL_t + \beta_2 CASHFLOW_t + v_{t+1}$								Panel B. $R_{t+1} = \alpha + \beta_1 ACCRUAL_t + \beta_2 CASHFLOW_t + \beta_3 BE/ME_t + \beta_4 ESHARE_t + \beta_5 D/P_t + \beta_6 DEF_t + \beta_7 TERM_t + \beta_8 TBILL_t + v_{t+1}$				
	Earnings regressions								Return regressions				
	α	$t(\alpha)$	β_1	$t(\beta_1)$	β_2	$t(\beta_2)$	$p(F)$	Adj-R^2 (%)	β_1	Rand. p	β_2	Rand. p	Adj-R^2 (%)
Agriculture	0.044	2.25	0.658	4.74	0.715	5.91	0.293	46	0.081	0.057	0.087	0.026	11
Food Pd.	0.015	0.68	0.959	7.01	0.912	7.32	0.747	58	0.005	0.423	0.001	0.469	−1
Candy/Soda	0.041	2.10	1.028	7.44	0.843	11.40	0.904	79	−0.014	0.393	−0.086	0.012	4
Beer/Liquor	0.081	3.23	0.488	3.08	0.530	3.67	0.267	23	−0.157	0.002	−0.171	0.001	7
Tobacco	0.055	1.58	1.170	4.24	0.869	10.49	0.880	74	−0.069	0.023	−0.120	0.003	21
Recreation	0.124	3.28	−0.077	−0.38	0.227	1.09	0.120	−1	−0.010	0.421	0.009	0.393	−19
Entertainment	0.034	1.86	0.697	5.32	0.735	6.04	0.291	47	0.105	0.084	0.046	0.227	11
Publishing	0.026	1.26	0.799	6.50	0.835	8.10	0.398	69	0.008	0.461	0.020	0.280	9
Consumer Gd.	−0.021	−1.18	0.463	3.43	1.023	13.80	0.000	83	0.015	0.320	−0.038	0.215	−7
Apparel	0.050	2.27	0.600	4.83	0.770	7.01	0.033	55	−0.073	0.114	−0.080	0.166	25
Healthcare	0.053	2.29	0.314	1.04	0.621	4.46	0.118	39	0.014	0.494	0.076	0.070	21
Medical Eq.	0.042	1.72	0.661	5.99	0.805	6.67	0.054	54	−0.036	0.223	−0.061	0.121	13
Drugs	0.001	0.02	0.885	9.72	0.982	9.25	0.213	78	−0.046	0.125	−0.085	0.006	20
Chemicals	0.013	0.60	0.384	1.91	0.770	6.83	0.037	54	0.040	0.056	−0.008	0.504	15
Rubber/Plastic	0.071	2.55	0.251	1.27	0.544	3.50	0.061	21	0.060	0.039	0.064	0.052	20
Textiles	0.093	3.60	−0.005	−0.03	0.245	1.36	0.089	1	0.027	0.247	−0.037	0.141	21
Construction Mt.	0.028	1.18	0.397	2.58	0.764	5.47	0.012	42	0.101	0.001	0.074	0.024	34
Construction	0.022	1.59	0.621	4.78	0.775	6.72	0.073	53	−0.021	0.372	0.012	0.410	29
Steel Works	0.042	1.93	0.450	1.65	0.511	3.17	0.422	21	0.017	0.315	−0.025	0.341	6
Fabricated Pd.	0.038	2.42	0.706	5.23	0.690	5.71	0.566	46	0.080	0.047	0.078	0.042	15
Machinery	0.041	1.71	0.688	5.03	0.698	4.31	0.480	48	0.051	0.084	−0.000	0.412	26
Electrical Eq.	0.057	1.87	0.551	4.11	0.674	3.87	0.209	32	0.019	0.354	−0.061	0.155	6
Autos	0.033	1.14	0.454	2.21	0.662	4.74	0.194	38	0.049	0.105	0.039	0.185	11
Aircraft	0.022	1.94	0.746	7.04	0.773	7.50	0.285	58	−0.046	0.304	−0.024	0.413	20
Ships	0.015	0.78	0.460	3.62	0.793	5.50	0.003	42	−0.085	0.012	−0.038	0.175	10
Defense	0.027	1.42	0.377	2.47	0.670	4.80	0.016	35	−0.000	0.486	0.042	0.188	−3
Precious metals	0.089	2.50	0.865	2.96	0.485	3.25	0.875	30	0.087	0.048	−0.063	0.173	7
Mining	0.045	2.72	0.867	4.13	0.613	4.84	0.886	43	−0.006	0.469	−0.049	0.202	5
Coal	0.046	2.35	0.900	4.27	0.646	5.26	0.891	45	0.063	0.032	−0.045	0.232	18
Oil/Gas	0.015	0.41	0.578	1.43	0.787	6.46	0.320	55	−0.010	0.302	0.022	0.213	18
Utilities	0.001	0.12	0.887	7.07	0.956	11.54	0.299	79	−0.022	0.185	−0.039	0.072	37
Communication	0.043	3.27	1.223	8.83	0.815	8.57	0.999	71	−0.086	0.038	−0.068	0.135	6
Personal Sv.	0.127	3.99	−0.090	−0.37	0.326	2.21	0.021	16	−0.088	0.019	−0.067	0.060	19
Business Sv.	0.108	3.36	0.643	4.14	0.475	3.24	0.876	30	0.129	0.002	0.102	0.004	23
Computers	0.038	1.76	0.679	4.05	0.762	7.93	0.268	61	0.141	0.002	0.162	0.002	1
Electronic Eq.	0.033	1.69	0.494	2.45	0.744	6.71	0.088	53	0.069	0.100	0.090	0.055	−4
Lab Eq.	0.064	2.61	0.817	6.75	0.572	3.66	0.927	54	0.042	0.216	0.033	0.284	23
Business Su.	0.047	1.82	0.235	0.72	0.529	3.63	0.182	22	0.015	0.208	0.007	0.324	6
Boxes	0.001	0.04	0.698	5.24	0.931	6.50	0.085	58	0.033	0.069	−0.001	0.562	15
Transportation	0.044	1.74	0.562	2.78	0.554	3.58	0.515	28	−0.007	0.432	0.023	0.234	10
Wholesale	0.121	4.35	0.260	1.64	0.298	1.75	0.138	3	0.062	0.330	0.087	0.267	17
Retail	0.049	2.72	0.609	4.50	0.716	6.89	0.090	56	0.023	0.385	0.038	0.296	−1
Rest./Hotels	0.019	0.84	0.335	1.72	0.756	6.88	0.013	55	0.054	0.084	−0.034	0.766	10
Banking	0.207	3.18	−0.115	−0.58	−0.252	−0.65	0.712	−4	−0.012	0.442	0.036	0.203	8
Insurance	0.093	3.62	1.029	3.95	0.629	5.91	0.944	49	0.016	0.325	−0.020	0.268	−5
Real estate	0.050	3.15	0.416	2.85	0.480	2.99	0.172	15	0.009	0.450	0.014	0.416	4
Trading	0.030	2.44	0.601	4.04	0.713	6.66	0.063	61	−0.039	0.293	−0.045	0.301	5
Other	0.043	2.31	0.662	4.74	0.705	6.09	0.255	49	0.145	0.077	0.089	0.200	15
Cross-industry	0.031	10.13	0.564	28.30	0.768	45.51	0.000	52	0.011	0.028	0.008	0.110	14

does not align well with the difference in the level of persistence between accruals and cash flows. For example, there are industries such as Consumer Goods, Apparel, and Defense for which the earnings persistence regression produces a coefficient on ACCRUAL that is significantly smaller than that on CASHFLOW (suggesting that accruals is less persistent than cash flows in those industries) but the return regressions uncover no evidence of predictability for either ACCRUAL or CASHFLOW. There are other industries such as Chemicals, Ships, and Restaurants/Hotels for which the earnings regression coefficient on ACCRUAL is also significantly smaller than that on CASHFLOW but only ACCURAL not CASHFLOW can significantly predict returns (often with the wrong sign).

Furthermore, the earnings fixation hypothesis implies that if accruals and cash flows predict returns, they do so with the opposite signs. However, for all the industries in which both accruals and cash flows are significant return predictors, they predict with the same sign. For example, the return regression coefficients on ACCRUAL and CASHFLOW are both negative and significant for Beer/Liquor and Tobacco, and positive and significant for Construction Materials and Computers. There is not a single industry for which ACCRUAL and CASHFLOW predict returns significantly but with the opposite signs, opposing the earnings fixation hypothesis.

In untabulated analysis, we also test the weakened version of the earnings fixation hypothesis, which says that accruals should be a more negative (less positive) return predictor and cash flows should be a more positive (less negative) return predictor in industries in which accruals is less persistent relative to cash flows as a predictor of industry earnings. Similar to the sector-level analysis, we divide the 48 industries into two groups, those in which the earnings regression coefficient on ACCRUAL is bigger than that on CASHFLOW (indicating that accruals is more persistent than cash flows), and those in which the ACCRUAL coefficient is smaller than the CASHFLOW coefficient (indicating that accruals is less persistent than cash flows). The first group consists of Food Products, Candy/Soda, Tobacco, Fabricated Products, Precious Metals, Mining, Coal, Communication, Business Services, Lab Equipment, Transportation, Banking, and Insurance, and the second group consists of the rest of the industries. As predicted by the weakened earnings fixation hypothesis, the average return regression coefficient on ACCRUAL for the first group (0.0175) is bigger than the average coefficient for the second group (0.0144). However, the difference between the two average coefficients (0.0031) is puny, and an F-test cannot reject the null that the two are equal ($p = 79.4\%$).

As with the results for accruals, the results for cash flows also lend fairly little support to the weakened earnings fixation hypothesis. In the return regressions, the average coefficient on CASHFLOW for the first group of industries in which accruals is more persistent than cash flows is −0.0137, whereas the average coefficient for the second group of industries in which accruals is less persistent than cash flows is 0.0047. The coefficient difference between the two groups (0.0184) is in the same direction as predicted by the weakened fixation hypothesis. However, it is not statistically significant. An F-test cannot reject the null that the two average coefficients are equal ($p = 49.6\%$).

Similar to the cross-sectional tests reported at the bottom of Table 7, we also test for the abilities of accruals and cash flows to predict earnings and returns across industries. The last row of Table 8 reports that, in the earnings regressions, the coefficient on CASHFLOW is higher (0.768) than that on ACCRUAL (0.564), and an F-test easily rejects the null that the two are equal (0.0%). However, in the return regression, ACCRUAL positively and significantly predicts returns (coefficient = 0.011, $p = 2.8\%$), while CASHFLOW is an insignificant positive return predictor (coefficient = 0.008, $p = 11.0\%$). Again, the evidence from the cross-industry tests does not support the earnings fixation hypothesis.

In summary, the sector and industry evidence provides little support for the earnings fixation hypothesis. A weakened version of the earnings fixation hypothesis receives mixed support at best.

6. Conclusion

At the firm level, accruals (the non-cash component of earnings) negatively predicts returns (Sloan, 1996), and cash flows positively predicts returns (Desai, Rajgopal, and Venkatachalam, 2004; Pincus, Rajgopal, and Venkatachalam, 2007). The leading explanation for these cross-sectional effects is behavioral: that earnings performance attributable to an extra dollar of cash flows is more persistent than earnings performance attributable to an extra dollar of accruals, but that naiveté or limited attention causes investors to neglect this distinction. In consequence, high accrual but low cash flow firms are associated with overvaluation and earn low subsequent returns.

We examine in this paper whether the accrual and cash flow effects extend to the market level. That is, we test the abilities of aggregate accruals and aggregate cash flows to predict aggregate stock returns. Our first main finding is that, in sharp contrast with the firm-level findings, aggregate accruals is an economically and statistically highly significant positive predictor of aggregate stock returns. A one standard deviation increase in aggregate accruals is associated with an increase in next year's market returns of about 7%. Since the accrual component of aggregate earnings is also less persistent than the cash flow component of earnings, this positive return predictability of aggregate accruals is inconsistent with the earnings fixation hypothesis. Furthermore, aggregate cash flow is a significant negative predictor of aggregate returns, which also opposes the fixation hypothesis.

Multivariate regressions that control for other aggregate return predictors confirm that accruals positively and significantly predicts returns and cash flows negatively predicts returns, and that the effects are economically substantial. Our controls are related to business cycle and business condition fluctuations and are therefore potential proxies for market discount rates. Thus, if our findings

are due to shifts in rational risk premiums, it must be that accruals and cash flows capture information about discount rates above and beyond the control variables we employ.

Our second main finding is that innovations in aggregate accruals are negatively associated with contemporaneous aggregate returns, and innovations in aggregate cash flows are positively associated with aggregate returns. Since accrual and cash flow innovations are associated with favorable cash flow news, these results suggest that expected future cash flows are discounted more heavily at times when accruals increases or when cash flows decreases. In addition, we find that the previously reported negative relation between aggregate earnings surprises and contemporaneous market returns (Kothari, Lewellen, and Warner, 2006) derives primarily from the accrual component of the surprises, with the cash flow component playing a dampening effect; after controlling for accrual innovations, the relation between earnings surprises and contemporaneous aggregate returns becomes insignificant.

An efficient market explanation for our main findings is that shifts in aggregate accruals and cash flows are correlated with shifts in market discount rates. However, this explanation requires that innovations in aggregate accruals and cash flows be associated with shifts in discount rates even after controlling for the several business cycle and business condition proxies included in our tests.

A possible behavioral interpretation of our findings is that firms "lean against the wind" in their earnings management. If firms that become undervalued are especially eager to report higher earnings by increasing accruals relative to their cash flows, then high accruals and low cash flows can be correlated with low contemporaneous returns and high subsequent returns. To reconcile this interpretation with the firm-level evidence on accruals and cash flows effects, however, requires an explanation for why firms are more prone to leaning against aggregate undervaluation than firm-specific undervaluation.[16]

We also explore the abilities of accruals and cash flows to predict sector and industry returns. We find that the level of accruals or cash flows is a significant positive return predictor for some sectors and industries, and a significant negative predictor for others. The magnitude for some of these sector- and industry-level effects is quite large. For example, for the High Tech sector, a one standard deviation increase in sector accruals or cash flows predicts a 15.6% or 9.8%, respectively, increase in sector returns next year.

However, the pattern of return predictability across sectors and industries using accruals or cash flows is not closely aligned with the relative persistence of the accrual versus cash flow components of sector or industry earnings, and therefore opposes the earnings fixation hypothesis. We also test a weakened version of the earnings fixation hypothesis which implies that the accruals should be a more negative return predictor in sectors (industries) for which accruals is less persistent than cash flows, and only find mixed results.

Overall, the market-, sector-, and industry-level evidence provides little support for the earnings fixation hypothesis. There is generally a lack of clear correspondence between return predictability based on accruals and cash flows with earnings performance attributable to accruals and cash flows as called for by the hypothesis.

Our evidence that the level of earnings components (operating accruals and cash flows) significantly predicts aggregate stock returns complements recent evidence (Kothari, Lewellen, and Warner, 2006) that another firm-level anomaly, PEAD, does not extend to the aggregate level. The cases of accruals and cash flows are particularly surprising, since the firm-level effects do not just vanish, but reverse at the aggregate level. At a minimum, our analysis raises a question of why different effects should dominate at the firm level versus in the aggregate. Furthermore, our findings that innovations in aggregate accruals are negatively correlated with contemporaneous stock returns, despite the fact that they contain favorable cash flow news, raises the question of why increases in aggregate accruals are associated with heavier discounting by the market. Our analysis therefore presents an intriguing challenge for both behavioral and efficient markets explanations for the accrual and cash flow effects.

An interesting direction for further research is to examine whether there are differences between firm- and aggregate-level predictability for other stock return anomalies that relate to firms' operating and reporting outcomes. For example, the balance sheet bloat (Net Operating Assets) effect (Hirshleifer, Hou, Teoh, and Zhang, 2004), like the accrual effect, is related to reporting issues such as earnings management. Similarly, behavioral hypotheses have been proposed for the capital expenditure effect, where capital investment negatively predicts returns (Polk and Sapienza, 2009; Titman, Wei, and Xie, 2004), and the R&D effect (Eberhart, Maxwell, and Siddique, 2004), where R&D expenditure positively predicts returns. It would be interesting to see whether these variables also have different predictive powers at the firm level than at the aggregate level.

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[16] One possibility is that firm-specific misvaluation tends to correct more quickly than aggregate misvaluation (see footnote 4), reducing the need for the manager to lean against it.

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