The Accruals Anomaly:
An investigation from firm growth perspective

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Abstract

This paper examines the relationship between the firm's growth opportunities and the accruals anomaly in the context of the q-theory and the investment based catering theory. The results are generally consistent with the predictions of the q-theory than with those of the catering theory. In addition, a number of business cycle indicators can help explain the presence of accrual premium while the contemporary factor models augmented with a market-wide sentiment factor seems to fail to capture the accruals anomaly fully.

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Comments welcome.

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1. INTRODUCTION

Sloan (1996) reports evidence of positive returns that cannot be fully explained by conventional asset pricing models when long positions are taken in the stocks of firms with low accruals and short positions are taken on the stocks of firms with high accruals. He argues that accrual anomaly arises because investors are mostly irrational and they tend to ignore the difference in the persistence of cash based *versus* accrual based earnings when making their earnings forecasts. As the cash based earnings are more persistent than the accrual based earnings, accruals are mispriced.

Subsequent to Sloan's paper, several studies have attempted to explain the presence of accruals premium. One popular line of investigations argues that, since the changes in working capital lie at the core of accruals measurements, accruals itself may be a reflection of firm's growth opportunities. For instance, Zhang (2007) documents a significant relationship between firm growth (as measured by employee growth) and the accruals anomaly and suggests that the anomaly can be explained from a growth perspective. Fairfield et al. (2003) argue that the accruals premium arises due to investors' failure to recognize the true contribution of growth to firm value. Wu et al. (2010) propose an asset pricing model with investment factors that can partially explain the accruals premium.

While Fairfield et al. (2003) attribute the mispricing to investors' misunderstanding extant literature on investment related anomalies views management's behavior as the source of the mispricing. Polk and Sapienza (2009) argue that managers of overpriced firms might invest in fixed capital to cater for investors' sentiment with the hope of extending the overpricing of stocks. Along these lines, Kothari et al. (2006) suggest that managers may also involve in earnings management in order to cater for investors' sentiment. More specifically, managers of overpriced firms might distort earnings upwards (hence high accruals) to nurture investors' expectations, whereas managers of underpriced firms have no motivation to distort earnings downwards.

We argue that the catering theory of Polk and Sapienza (2009) may also account for the accruals anomaly from the short-term investment perspective (hereafter the 'catering theory'). As noted earlier, in Polk and Sapienza (2009), managers of overpriced firms might invest in fixed capital to cater for investor sentiment and hope that their stocks can continue to be overpriced. We argue that managers may also invest in working capital (hence high accruals) for the same purpose. Furthermore, to the extent that accruals reflect firms' investment in working capital, it is possible that the inverse relation between accruals and stock returns is driven by the q-theory which attributes such relation to firms' investment decisions in response to the changes in discount rates.

The primary objective of the paper is to test for the implications of the q-theory and the catering theory in explaining the relationship between the firms' growth opportunities and the accruals anomaly. Given that the level of investments in the working capital partly reflects the firm's growth we first establish its relationship with the accruals anomaly. According to Li and Zhang (2010) the q-theory predicts a steeper slope in a regression of stock returns on accruals of financially constrained firms. Extending Li and Zhang's (2010) argument into the portfolio context we test whether the return to the accruals trading strategy is more pronounced among the financially constrained firms. As financial constraints matter the most when the firms have growth opportunities we also test whether firm's growth opportunities and financial constraints reinforce the impact of each other on the accruals anomaly.

To test for the implications of the catering theory we first examine how mispricing (a factor that has generally been attributed to mispricing) affect the accruals anomaly. We then investigate the ability of sentiment betas (which are used in the catering theory) in explaining the accruals anomaly. Finally, using the portfolio approach, we test whether the impacts of financial constraints and sentiment betas (if any) on the accruals anomaly are subsumed in each other. Using the asset pricing framework of Avramov and Chordia (2006), we also test whether a market-wide sentiment factor can provide any additional information on the presence of accruals anomaly. In addition, as firms invest mainly in response to the changes in the discount rates that tend to co-vary with business cycles, we examine whether a number of business cycle indicators can capture the accruals anomaly.

In a sample of firms listed in NYSE, AMEX, and NASDAQ during 1973–2010 we document a return to the accruals trading strategy of 0.54% (0.76%) per month based on the total accruals quintiles calculated from balance sheet (cash flow statement). In addition, consistent with the evidence on firm's growth, investment and accruals anomaly, we also find a positive relationship between the accruals anomaly and a recently developed long term growth measure (derived from the M/B decomposition approach of Rhodes-Kropf, Robinson and Viswanathan (hereinafter RKRV) (2005). Consistent with the predictions of the q-theory we observe a steeper slope when excess stock returns are regressed on total accruals of financially constrained firms. Furthermore, there is evidence that financial constraints and long term growth exhibit a joint impact on the accruals anomaly.

The accruals anomaly is more pronounced among firms that have extreme sentiment betas (negative as well as positive). However, when the effect of firm size is controlled for only the impact of positive sentiment betas persists. Given that financial constraints impose investment frictions (Li and Zhang, 2010) and that the earnings management is more likely to happen among financially constrained firms (Linck et al., 2012) our findings suggest that the catering is more likely to be achieved via the investment channel rather than through the earnings management channel. This inference is consistent with the conclusion of Kothari et al. (2006) that earnings management reflects mispricing. However, using the firm level mispricing proxy which measures the difference of firms' market value relative to industry peers contemporaneously, we find no evidence on whether mispricing plays any role to the accruals anomaly.[1] Overall, the evidence for the investment based catering explanation of the accruals anomaly is limited.

Furthermore, the impact of sentiment betas is not subsumed within the impact of financial constraints implying that the two corresponding explanations may independently exist. Finally, while there is some evidence on the role of sentiment betas in the portfolio context, augmenting the Carhart (1997) model with the market-wide sentiment factor does not help in explaining the accruals anomaly. The accruals anomaly can be completely captured by the widely used business cycle indicators (the risk free rate, default spread, term spread, and dividend yield) within the framework of Avramov and Chordia (2006). This lends further support to the q-theory explanation of the accruals anomaly.

[1] Both the firm growth and the mispricing proxies are derived from the M/B decomposition following RKRV (2005).

This paper makes a number of contributions to the current literature. Extending the work of Wu et al. (2010), the paper provides new evidence that is consistent with the q-theory interpretation of the accruals anomaly. This paper also presents the first attempt to empirically test the implications of the catering theory on the role of firm's growth and investment in explaining the accruals anomaly. Finally, we provide evidence that market sentiment and the business cycle factors tend to play different roles in explaining the accruals anomaly.

2. FIRM INVESTMENT AND THE ACCRUALS ANOMALY

A growing line of research views accruals as a reflection of firm's growth. Changes in working capital lie at the core of the accruals measure using the balance sheet items as in Sloan (1996). As accruals represent firms' investments in working capital, they reflect firms' growth. Viewing accruals as investment in working capital, Wu et al. (2010) suggest an explanation to the accruals anomaly using the q-theory. Management rationally adjusts firms' investment in working capitals as the discount rate changes. When the discount rate is lower, more investment projects become profitable, hence firms would invest in presumably both fixed and working capitals. Furthermore, lower discount rate means lower expected returns going forward. Hence, to the extent that accruals reflect firms' investments in working capitals, higher accruals would be followed by lower expected stock returns. The opposite happens when the discount rate is higher. As the supporting evidence, Wu et al. (2010) document that the return to the accruals trading strategy can be partially explained by the CAPM or Fama and French three factor model supplemented with an investment factor.

Another possible channel through which firm growth may affect the accruals anomaly is the management investing in working capital to cater for investors' sentiment.[2] Polk and Sapienza (2009) provide evidence on managers of overpriced firms investing in

[2] Another interpretation of the catering theory examined in Kothari et al. (2006) is that management manages earnings to cater for investor sentiment. Our focus is on the investment decision that management may undertake to achieve the same objective.

fixed capital in order to please the firms' investors and maintain the overpricing of stocks. Since (short-term) working capital investment is more reversible than (long-term) fixed capital, managers may invest in working capital for the same purpose. To the extent that accruals reflect firms' investment in working capital, investment in working capital to cater for investor sentiment may result in the accruals being mispriced in the stock returns, hence the accruals anomaly.[3]

This paper examines the patterns of the accruals anomaly from the investment perspective as predicted by the q-theory and the catering theory. Given that we view the accruals anomaly through the investment perspective, we first establish whether growth is related to the accruals anomaly:

H_1: The higher growth opportunities the firms have, the higher the return from the accruals based trading strategies.

Zhang (2007) and Fairfield et al. (2003), among others, document that the accruals anomaly is attributable to the growth information contained in accruals.[4] Fairfield et al. (2003) specifically attribute the accruals anomaly to investors failing to understand the true contribution of growth to firm value. Zhang (2007), on the other hand, is silent on the mechanism that relates growth to future stock returns. We extend the literature by investigating the implication of firms' growth opportunities to the accruals anomaly in the context of the q-theory *versus* the catering theory.

With regard to the q-theory explanation, we apply the approach established in Li and Zhang (2010). In a two period setting, Li and Zhang (2010) show analytically that the negative slope of return on investment is steeper as investment adjustment costs increase. Accordingly, they empirically test whether the q-theory underlies several investment related anomalies by comparing the slope of excess returns on the relevant variables (i.e.

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[3] Due to the difference in the reversibility of working capital and fixed capital, working capital may be at a level higher or lower than that needed to support the new fixed capital investment. This possibility may explain why Wei and Xie (2008) find that the return predictability of fixed capital investments is related to the return predictability of accruals, yet they are not subsumed by each other.
[4] Zhang (2007) does not find supportive evidence for the explanation put forward by Sloan (1996) based on the persistence of the accruals based earnings.

asset growth, investment growth, abnormal corporate investment, net operating assets, and net stock issuance) among firms that are exposed to different levels of investment frictions. On the basis that financial constraints reflect investment frictions, they are used as the proxies for investment adjustment cost. Along the line of Li and Zhang (2010), we test the relationship between financial constraints and the accruals anomaly that is consistent with a q-theory explanation as follows:

$H_{2.1}$: The slope of stock returns on accruals is steeper among financially constrained firms.

Extending into the portfolio context, as the relationship between stock returns and accruals is more pronounced, we expect larger returns to the accruals trading strategies among the financially constrained firms. Furthermore, financial constraints matter only when firms have growth opportunities. Therefore we test whether financial constraints and growth opportunities reinforce the impact of each other on the accruals anomaly. These conjectures are formalized in the following hypotheses:

$H_{2.2}$: There is a positive association between the levels of the firm's financial constraints and the returns from the accruals based trading strategies.

$H_{2.3}$: Financial constraints and growth opportunities reinforce each other's impact on the accruals anomaly.

Next, we test the conjectures that are consistent with the predictions of the catering theory in explaining the accruals anomaly. An important premise of the catering theory is that stocks are over-priced and management takes actions to prolong the overpricing. We therefore test whether the accruals anomaly is more pronounced among firms that are more overpriced. Our next hypothesis is as follows:

$H_{3.1}$: More overpriced the stocks are associated with the higher return from the accruals based trading strategies.

A unique feature of the catering theory is the role of investors' sentiment. We expect that managers are more likely to get involved in this activity when the firm's stock prices are more sensitive to the investors' sentiment. This concept reconciles perfectly with the *sentiment beta* of Baker and Wurgler (2007) that measures the sensitivity of stock prices to the index of market-wide sentiment changes. Our next hypothesis is:

$H_{3.2}$: The more sensitive the stock returns are to investors' sentiment the higher the return from the accruals based trading strategies.

The investment based catering theory and the q-theory are similar in the sense that working capital investment gives rise to the accruals anomaly. They are, however, different as in the former management responds to investor sentiment while in the latter management responds to changes in the discount rate. We test if the impacts of the financial constraints (consistent with the q-theory) and the investor's sentiment beta (consistent with the catering theory) still exist after controlling for each other's effect. This leads to our next hypothesis:

$H_{3.3}$: Financial constraints and investment sentiment beta subsume the impact of each other on the returns from the accruals based trading strategies.

Finally, the pattern of the return to the accruals based trading strategies may shed further lights on the current debate. Wu et al. (2010) argue that the return to the accruals trading strategies follows a cyclical pattern due to (a) the similarity between the accruals and the value anomaly (Desai et al., 2004), and (b) the association between both anomaly variables and firms' investments.[5] Wu et al. (2010) document that the return to the accruals strategy can be predicted using the variance risk premium of Bollerslev et al. (2009) but cannot be predicted using the more widely used variables such as the term spread, the default spread, and the relative Treasury bill rate, individually.

On the other hand, extant literature shows that the return to the accruals trading strategy varies with the market-wide investor sentiment. Ali and Gurun (2009) and Gerard et al. (2009) concede that the accruals based strategy works better during high investor sentiment periods.[6] The former study attributes this tendency to investors paying less

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[5] While Green et al. (2009) concede that the return to the accruals trading strategy has been driven down to negative recently, Wu et al. (2010) argue that the weakening return is only temporary due to its cyclicality.

[6] Another related time varying pattern documented in Livnat and Petrovits (2009) is that stocks with low accruals generate higher returns following low sentiment periods. The authors attribute this pattern to investor under-reaction to the accrual information that disconfirms their belief about the current market state.

attention to the difference in accruals based and cash based earnings. The latter attributes it to investor optimism in investing in high distress stocks. We argue that the investment based catering theory also predicts the return to the accruals trading strategy to vary with the sentiment cycle as management responds to investor sentiment.

Our final investigation is on whether the return to the accruals based trading strategies can be explained by the factors representing business cycles or market-wide investor sentiment. Any evidence for the former (latter) would be consistent with the q-theory (the catering theory). The associated hypotheses are:

$H_{4.1}$: The accruals anomaly can be explained by an asset pricing model that is augmented with the market-wide sentiment factor.

$H_{4.2}$: The accruals anomaly can be explained by an asset pricing model that is augmented with the business cycle factors.

3. THE METHODOS AND THE SAMPLE

3.1. Measurement of key firm level variables

This section describes the choice of the key firm level variables used in this study. The construction of these variables is summarized in Appendix A.

3.1.1. Measures of accruals

Accruals are measured in different ways in the literature including total accruals, abnormal accruals, the items in balance sheet, and the items in cash flow statement. In this paper, we investigate the accruals anomaly from the perspective of firms' working capital investment and therefore we use the total accruals measure. The two measures of total accruals are:

$$ACCBS = \frac{(\Delta CA - \Delta CL - Dep)}{TA} \quad (1)$$

$$ACCOCF = \frac{(NI - OCF)}{TA}, \tag{2}$$

where $ACCBS$ is the total accruals measure calculated from the balance sheet following Sloan (2006), $ACCOCF$ is the total accruals measure calculated from the cash-flow statement following Hribar and Collins (2002) and Kraft et al. (2006). ΔCA measures changes in non-cash current assets, ΔCL measures changes in current liabilities excluding short-term debts and tax payables, Dep is the depreciation charge during the year. NI is earnings, OCF is cash-flow from operations, TA is the average total assets. $ACCOCF$ is only available from 1987 as firms start reporting the cash-flow statement since then.

3.1.2. *Mispricing and growth opportunities*

We use the M/B decomposition method in Rhodes-Kropf, Robinson and Viswanathan (2005) to measure mispricing and growth. We justify the use of the M/B decomposition in studying the accruals anomaly by the similarity between the value anomaly, often defined along the dimension of M/B, and the accruals anomaly documented in the extant literature. Desai et al. (2004) suggest that the accruals anomaly is the value anomaly in disguise. The proxies for mispricing and long term growth from the M/B decomposition has also been employed in other studies including Doukas et al. (2005) and Hertzel and Li (2010). Following RKRV (2005), M/B is written as:

$$m - b = (m - v) + (v - b) \tag{3}$$

in which m, b and v are the natural log of the market value, the book value, and the fundamental value of the stock. For firm i in industry j at time t, the fundamental value v can be expressed as firm specific accounting information θ_{it}, a vector of industry average contemporaneous accounting variables α_{jt}, and a vector of long-run industry average accounting variables α_j. The natural log of M/B for firm i in industry j at time t can be decomposed as in equation (4):

$$m_{it} - b_{it} = [m_{it} - v(\theta_{it}, \alpha_{jt})] + [v(\theta_{it}, \alpha_{jt}) - v(\theta_{it}, \alpha_j)] + [v(\theta_{it}, \alpha_j) - b_{it}] \tag{4}$$

We are interested in the parameters within first and the third square brackets. The terms in the first square bracket captures the mispricing of firms relative to its industry peers contemporaneously. The element in the third square bracket is the difference in the firm's intrinsic value implied by the long-run industry average multiples and its book value. This element captures the long-run growth component of the M/B ratio.

In order to extract the mispricing and the growth components, we need to estimate $v(\theta_{it}, \alpha_{jt})$ and $v(\theta_{it}, \alpha_j)$. The RKRV's third model (equation 15, page 577) of market value, which nests their other models, are employed as follows:

$$m_{it} = \alpha_{0jt} + \alpha_{1jt}b_{it} + \alpha_{2jt}ln(NI)^{+}_{it} + \alpha_{3jt}I_{(<0)}ln(NI)^{+}_{it} + \alpha_{4jt}LEV_{it} + \varepsilon_{it} \qquad (5)$$

in which NI^{+}_{it} is the absolute value of the net income of firm i during year t. $I_{(<0)}$ is the indicator when the net income is negative. LEV_{it} is the book leverage ratio of firm i during year t, measured as $\left(1 - \frac{Book\ value\ of\ Equity}{Total\ Assets}\right)$.

We run the cross sectional regression of equation (5) annually for each of the 12 industry groups as categorized by Fama and French.[7] The fitted value from the regression measures the estimate of $v(\theta_{it}, \alpha_{jt})$. The regression error $m_{it} - v(\theta_{it}, \widehat{\alpha_{jt}})$ captures the first square bracket in equation (4), the firms' mispricing relative to industry valuation. The estimate of $v(\theta_{it}, \alpha_j)$ is the "fitted" value from the cross sectional regression of equation (5) using the time series average of the estimated coefficients.

3.1.3. Financial constraints

Studies offer different measures for firms' financial constraints such as the KZ and WW indices by Kaplan and Zingales (1997) and Whited and Wu (2006), respectively. In a recent development, Hadlock and Pierce (2010) cast doubt on the use of these indices and suggest firm's total asset size and age as alternative measures. Following Almeida and Campello (2007)[8] we use *total assets* and the *payout ratio* to proxy for financial

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[7] Fama and French industry classification is available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Research.

[8] They also use dummy variables reflecting whether firms' bonds and commercial papers are rated. However, the dummy variables do not describe the variation in financial constraints at firm level.

constraints.[9] Following Hahn and Lee (2009), the payout ratio is calculated as total distribution (dividends and repurchases) scaled by net income before extraordinary items. The payout ratio is not calculated when the distribution is positive and the incomes are negative.

3.1.4. Sentiment beta

Following Baker and Wurgler (2007) we measure the sentiment beta as the extent to which stock prices co-move with an index of sentiment changes. To estimate the sentiment beta, we run the time series regression of excess stock returns on Carhart's (2007) four factors, including the excess market return, HML, SMB and UMD, plus Baker and Wurgler's (2007) index of sentiment changes as follows:

$$R_{jt} - R_{Ft} = \alpha_0 + \alpha_1 \times (R_{mt} - R_{Ft}) + \alpha_2 \times HML_t + \alpha_3 \times SMB_t + \alpha_4 \times UMD_t + \alpha_5 \times DSENTO_t + \varepsilon_{jt} \quad (6)$$

where R_{jt} is the return on stock j, R_{Ft} is the risk free rate, and R_{mt} is the value weighted market return. HML_t, SMB_t, and UMD_t are the value, size and momentum factors in the Carhart four factor model. $DSENTO_t$ is Baker and Wurgler's index of sentiment changes where the sentiment is based on the first principal component of six sentiment proxies orthogonalized with respect to macroeconomic variables. [10] For each stock j, a time series regression of equation (6) is run for the whole sample time period to estimate the sentiment beta α_5.

3.2. Methodology

We employ univariate analysis to investigate the association among the key firm level variables, accruals, and the return to the accruals trading strategy. Stocks are sorted in ascending order on the accruals ratios (i.e. ACCBS or ACCOCF, as described in section 3.1.1) as at 31 December (year t-1). Quintile portfolios are constructed and positions (long and short) are taken at the beginning of July of the following year (year t) and held until the

[9] Another alternative is financial leverage. However, as Hadlock and Pierce (2010) point out that financial leverage is potentially endogenous. Furthermore, a firm might have high debt overhang but if it can get access to bank loans or capital markets it could still be financially flexible.

[10] The index of sentiment changes is available at http://pages.stern.nyu.edu/~jwurgler/.

end of June the next year (year t+1).[11] The raw returns of five equally weighted quintiles and of the hedge portfolio long in stocks with low accruals (bottom accruals quintile) and short in stocks with high accruals (top accruals quintile) are reported. The portfolio median measures of key firm level variables for the accruals sorted quintiles are also reported.

We then follow Li and Zhang (2010) in testing whether the Fama and MacBeth slope in the regression of excess returns on the accruals ratio is steeper amongst different groups of firms. In June year t, stocks are sorted into groups by financial constraint variables measured at the end of year t-1. In each month from July of year t to June of year t+1, excess stock returns are regressed against the accruals ratio (i.e. either ACCBS or ACCOCF) in each tercile. The slopes of the accruals ratio in the extreme portfolios are compared using a t-test of equality in the accruals ratio's coefficients.

Along the lines of Lam and Wei (2011) we also report the slopes of the accruals ratio when control variables are added to the Fama and MacBeth cross sectional regressions as follows:

$$R_{jt} - R_{Ft} = a_{0t} + a_{1t} \times ACC_{j,t-1} + \sum_{i=1}^{8} b_{it}\, Controls_{ijt-1} + e_{jt} \tag{7}$$

in which R_{jt} is the return on stock j and R_{Ft} is the risk free rate at month t. $ACC_{j,t-1}$ is the accruals ratio (i.e. either ACCBS or ACCOCF) measured at the end of December (month *t-7*) for the regression of excess returns from July (month *t*) to the following June (month *t+11*). $Controls_{ijt-1}$ are (i) natural logarithm of M/B measured at the same time with the accruals ratio, (ii) the natural logarithm of market capitalization measured at the end of month *t-1*, (iii) the past cumulative returns of months 2 to 3, 4 to 6, and 7 to 12, (iv) the natural logarithm of the NYSE/AMEX and NASDAQ turnover variables at the end of month *t-1*, and (v) the NASDAQ listing status dummy variable.

Finally, to test whether the accruals anomaly can be explained by an asset pricing model, we use the framework of Avramov and Chordia (2006). The framework involves a

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[11] The gap of six months between the account year end and the beginning of the portfolio holding period ensures that investors have access to information necessary to compose the portfolios.

two stage procedure. Avramov and Chordia (2006) use firm-level data rather than the traditional portfolio approach in order to avoid (a) losing information when stocks are grouped into portfolios and (b) data snooping biases. In stage one, stock returns of individual firms are adjusted for risks by running a time series regression of equation (8) below for the entire sample period:

$$R_{jt} - R_{Ft} = \alpha_{0j} + \sum_{i=1}^{m} \beta_{ij} F_{it} + \varepsilon_j \qquad (8)$$

where R_{jt} is the return on stock j and R_{Ft} is the risk free rate at month t. F_{it} represents the factors in the asset pricing model used in this stage to adjust stock returns for risk. In stage two, the risk adjusted returns are regressed against the accruals ratio and other control variables that proxy for other widely documented asset pricing anomalies. The cross sectional regressions of the following equation are run at month t:

$$R^{*}_{jt} = a_{0t} + b_{0t} \times ACC_{jt-1} + \sum_{k=1}^{n} b_{kt}\, Controls_{jt-1} + e_{jt} \qquad (9)$$

where R^{*}_{jt} is the risk adjusted return of stock j at time t, measured as the sum of the constant and the residual terms from equation (8). The right hand side variables are the transformation of the accruals ratio and the control variables defined in equation (7) following Avramov and Chordia (2006) and Brennan et al. (1998): (i) lagging two months (size and turnover variables), (ii) taking natural logarithm (size, turnover, M/B and the accruals ratio), and (iii) taking deviation from the respective cross sectional mean (size, turnover, M/B, cumulative returns and the accruals ratio). The transformed size, turnover and cumulative returns are lagged one month. These variables are lagged to avoid any biases caused by bid-ask effects and thin trading. Due to the considerable skewness, the variables are transformed using natural logarithm. Finally, taking deviation from the cross sectional mean implies that the average stock will have the values of each of the firm level characteristic equal to zero, and the expected return is determined solely by the risk factors.

3.3. The Sample and Summary Statistics

The sample comprises all stocks listed on the three major US stock markets, NYSE, AMEX and NASDAQ, from the merged CRSP and Compustat database. Financial (SIC code 6000 - 6999) and utilities (SIC code 4900 - 4999) stocks are eliminated. Financial firms are excluded, as they have different asset structures. Utilities are excluded, as different aspects of these firms, potentially including their investments, are more strictly regulated. We also exclude observations with stock prices below $5 so that our results are not driven by small and illiquid stocks or bid-ask bounce. Only firms with ordinary common equity (security type 10 and 11 in CRSP) are included. We also exclude firms with negative book value of equity. Finally, we exclude observations with insufficient information to calculate at least one of the two accruals ratios. The sample with ACCBS covers 450 months from July 1973 to December 2010 with 840,915 firm-month observations. The sample with ACCOCF covers 270 months from July 1988 to December 2010 with 614,644 firm-month observations. Except noted otherwise our data is from CRSP and Compustat databases. We use the risk-free rate provided in CRSP that was originally sourced from French's website.

Panel A of Table 1 reports summary statistics for the key variables. Both accruals ratios (i.e. ACCBS and ACCOCF) show a small degree of skewness. The mispricing and the growth components of the M/B decomposition is not skewed by construction. The other variables, including the financial constraint variables, M/B and the sentiment beta show a high degree of skewness given the considerable differences between means and medians. The median total accruals calculated from the balance sheet (cash flow statement) are -3% (-5%) of its average total assets, consistent with the level reported in the extant literature.[14] The average firm has the M/B ratio of 2.93, nearly double the median M/B ratio. The mean balance sheet size is $1.67 billion, about six times the median balance sheet size of $264 million. The average firm distributes 75% of its net income before extraordinary items in the form of dividends and repurchases, about three times that of the median firm at 26%. The average (median) firm has the return co-moving negatively with the market-wide sentiment changes, with the sentiment beta of -0.11 (-0.22).

[14] For example, Wei and Xie (2008) report the total accruals of -4.6% for the sample from 1972-2005.

Panel B shows that the Spearman's cross-sectional correlations among the accruals ratios and the other key firm level variables. The two accruals ratios (ACCBS and ACCOCF) are highly correlated with the correlation ratio of 0.73. Financial constraints appear to show up in both dimensions measured in this paper. Their correlation is reasonably high (0.32). Big firms therefore tend to distribute more than small firms, consistent with Li and Zhang's (2010). As expected, M/B is positively correlated with the mispricing and the growth components extracted from it, with the correlation of 0.75 and 0.59 respectively. Mispricing and growth appear to be unrelated, with the correlation being positive and approximately zero. Finally, the sentiment beta appears to be unrelated to the other firm level variables. It is negatively correlated with the other variables, with the correlation magnitude of close to zero.

[Insert Table 1 about here]

4. RESULTS

Low and high accruals portfolios are formed by sorting stocks on ACCBS (Table 2, panel A) and on ACCOFC (Table 2, panel B) into quintiles following the portfolio sorting described in section 3.2. In panel A, the returns to the equally weighted portfolios almost follow a monotonic pattern, increasing from the growth portfolio to the value portfolio. The return to the hedge portfolio is 0.54% per month and is statistically significant. Similar pattern is observed in the sample with ACCOCF (panel B).[15] The magnitude of the return to the accruals trading strategy is comparable with the extant literature. For example, Wei and Xie (2008, table 2, p. 37) report an average return of 0.56% per month based on total accruals deciles in a sample of non-financial stocks listed on NYSE, AMEX and NASDAQ between 1972 and 2005.

[Insert Table 2 about here]

[15] Similar patterns are observed when the sample is filtered to have available data to construct the key firm level variables. The returns to the ACCBS quintiles follow a declining pattern from low to high accruals quintile. The returns to the long-short portfolios are positive and statistically significant, varying between 0.36% per month and 0.51% per month. The returns to the ACCOCF quintiles also follow the same pattern. The returns to the long-short portfolios vary within 0.42% per month and 0.75% per month. Detailed results are available upon request.

4.1. Firm's growth opportunity and the accruals anomaly

To test the patterns of the accruals anomaly from the investment or growth perspective, we first examine the relationship between the accruals anomaly and firms' long term growth. The long term growth measure is extracted from decomposing M/B, reflecting the difference between the firm's fundamental value implied by long term industry average multiples and its book value. Panel A of Table 2 shows that long term growth increases with accruals almost monotonically in the subsample with ACCBS. The median long term growth proxy of the low accruals quintile is 0.47 whereas that of the high accruals quintile is 0.60, about 1.5 times higher. Firm with higher accruals appear to have more long term growth than those with lower accruals.

In Panel A of Table 3, firms in the subsample with ACCBS are independently partitioned into terciles based on the long term growth proxy and into quintiles based on total accruals. The return to the accruals trading strategy increases monotonically in the low to high growth tercile. The return to the accruals trading strategy is statistically insignificant in the low growth tercile whereas significant in the medium and high growth terciles. While the return to the accruals trading strategy in the overall subsample with ACCBS and the growth proxy is 0.36% per month, that in the subsample with high growth tercile is 0.59% per month, about 60% higher. An F-test rejects the joint equality of the return to the accruals trading strategy across the three terciles.

The patterns are less pronounced in the subsample with ACCOCF. The growth proxy does not follow a monotonic pattern across firms sorted by ACCOCF. From 0.52 in the bottom quintile, it drops to 0.46 in the second quintile before increasing to 0.62 in the top quintiles (Panel B of Table 2). The accruals anomaly is evidently stronger among firms with higher growth. In the low growth tercile, the return to the accruals trading strategy is 0.15% per month and is statistically insignificant. It is 0.75% per month and is significant in the high growth tercile. An F-test also rejects the joint equality of the accruals trading strategy across the three tercile.

[Insert Table 3 about here]

The results support a positive relationship between the accruals anomaly and the long term growth (H_1). Desai et al. (2004) suggest that the accruals anomaly and the value anomaly, often defined along the M/B dimension, are in fact the same anomaly.[16] Several studies in the literature have used M/B as a proxy for growth although it is still debatable whether the relationship between M/B and stock returns are driven by mispricing. By extracting only the growth component from M/B, our growth proxy is finer. Our evidence for the relationship between the accruals anomaly and firm growth is therefore stronger.

The association between the firms' growth opportunities and the accruals anomaly has been documented in the literature using different proxies of growth opportunities. We use RKRV's (2005) long term growth component from M/B decomposition as a measure of growth opportunity. This measure being the difference in the firm value implied by long term industry average multiples and the book value it institutively reflects the long term growth prospect of the firm. We also examine the roles of the firms' financial constraints and investors' sentiment in the context of the two theories (i.e. the q-theory and the catering theory respectively) in the sections below.

4.2. Financial constraints and the accruals anomaly

This section examines the relationship between financial constraints and the accruals anomaly in the context of the q-theory explanation of the accruals anomaly. Li and Zhang (2010) focus on the relationship between financial constraints and various investment related anomalies in a firm level cross sectional framework. On the basis that accruals reflect firms' investment in working capital we examine the relationship between financial constraints and the accruals anomaly. Both the portfolio and the cross sectional analyses are employed.

4.2.1. Portfolio analysis

Financial constraints do not exhibit a monotonic pattern across the accruals quintiles, including both ACCBS and ACCOCF, when measured by all of the three

[16] Table 1 shows that M/B is positively correlated with both measures of total accruals. However, the magnitude of the correlation is economically low for ACCBS (0.12) and close to zero for ACCOCF.

measures. In Table 2, firms in the extreme accruals quintiles tend to have higher financial constraints as measured by smaller size (total assets) and lower payout ratios. In Table 4, stocks are independently divided into terciles (30-40-30) by the financial constraint proxies and total accruals measured at the end of December year *t-1*. The portfolios are held from July year t to June year *t+1*.

In the subsample with ACCBS, the hedge return increases monotonically from the unconstrained to constrained terciles. An F test rejects the null hypothesis of joint equality of the return to the accruals trading strategy across the financial constraint terciles regardless of the financial constraint proxies. In the subsample with ACCOCF, the return to the accruals trading strategy also increases monotonically across the financial constraint terciles. However, an F test rejects the null only when financial constraints are proxied by total assets. Overall, the evidence supports the conjecture that the accruals anomaly is more pronounced amongst financially constrained firms, lending support to hypothesis $H_{2.2}$ based on q-theory.

[Insert Table 4 about here]

Financial constraints are more relevant to firms with higher growth potential. Given the evident impact of financial constraints and firms' growth on the accruals anomaly, we further investigate if there is a combined effect. In Table 5, only stocks with available data to construct the proxies for both the long term growth proxy and financial constraints are included. Stocks are independently sorted based on total accruals (both ACCBS and ACCOCF), long term growth and financial constraints (total assets and payout ratio) measured at the end of December year *t-1*. The portfolios are held from July year *t* to June year *t+1*. The returns to the long-short portfolios are reported.

[Insert Table 5 about here]

When total accruals are measured by ACCBS, in the subsample with total assets and firms' long term growth, the return to the accruals trading strategy in the groups partitioned by long term growth exhibits the same pattern as documented in section 4.1 (hypothesis H_1). The hedged return increases from 0.08% per month (statistically insignificant) to

0.59% per month (statistically significant) as the long term growth proxy increases. An F-test rejects the null of joint equality of the hedged return across the growth terciles at 1% level. The hedged return follows a pattern across the groups by financial constraints similar to that described in section 4.2 (hypothesis $H_{2.2}$). The hedged return declines from 0.65% per month in the constrained group to 0.26% per month in the unconstrained group. The null of joint equality is rejected at 5% level.

Controlling for financial constraints, the pattern of the return to the accruals trading strategy across the growth spectrum remains unchanged. However, an F-test on joint equality is significant only in the constrained tercile. Controlling for long term growth, the hedged return also follows a declining trend from constrained to unconstrained tercile. An F-test only rejects the null of joint equality across the financial constraint terciles in the subsample of firms with high growth. The evidence suggests the joint impact of financial constraints and long term growth on the accruals anomaly, resulting in the highest hedged return in the group of firms with high financial constraint – high growth. When financial constraints are proxied by payout ratio, qualitatively similar patterns are observed.

When total accruals are measured by ACCOCF, the patterns of the return to the accruals trading strategy across the growth tercile and the financial constraint tercile remain qualitatively similar. However, controlling for financial constraints, the return to the accruals trading strategy does not exhibit any significant pattern across the groups of firms by long term growth. Also, controlling for long term growth, the hedged return does not exhibit any significant pattern across the groups of firms by financial constraints. Overall, when accruals are measured by ACCBS, the evidence suggests that financial constraints and long term growth reinforce the impact of each other on the accruals anomaly, supporting hypothesis $H_{2.3}$. No significant pattern is observed when total accruals are measured by ACCOCF.

4.2.2. Slopes in the Fama and MacBeth regressions of returns on total accruals

Li and Zhang (2010) test the prediction of the q-theory for a variety of investment related anomalies by comparing the Fama and MacBeth slopes of excess returns on the relevant different firm investment variables. Following Li and Zhang (2010) we test the equivalent prediction for the accruals anomaly, given that total accruals reflect firms' investment in working capital and the results are reported in Table 6.

[Insert Table 6 about here]

Panel A of Table 6 reports the results when total accruals are measured by ACCBS. When financial constraints are proxied by total assets, the average slope of monthly excess stock returns on ACCBS is -2.14 and is significant, suggesting a negative relationship between total accruals and stock returns. This is consistent with a positive and significant return to the accruals trading strategy. The slope becomes less steep as firms are less financially constrained, from -3.28 in financially constrained (small) firms to -1.24 in financially unconstrained (large) firms. A t-test for equality suggests that the difference between the slope in the constrained and the unconstrained firms is statistically significant. Qualitatively similar results are observed when financial constraints are proxied by the payout ratio. When total accruals are measured by ACCOCF, we observe the negative and significant slope in the overall sample regardless of the proxy for the financial constraint status. The slope also gets less steep as firms are less financially constrained. However a t-test does not reject that the difference between the slope in the constrained and the unconstrained firms is statistically significant.

Lam and Wei (2011) extend Li and Zhang's (2010) test by adding the control variables that are known to affect the cross section of stock returns to the monthly cross sectional regressions on total accruals. We add M/B, size, cumulative returns, turnover and NASDAQ dummy to the cross sectional regression as described in equation (7). Qualitatively similar results are observed. Overall, when accruals are measured by ACCBS, the evidence suggests a less steep slope of stock returns on accruals as firms are less financially constrained, supporting hypothesis $H_{2.1}$. As in section 4.2.1, no significant pattern is observed when total accruals are measured by ACCOCF.

4.3. Investor sentiment and the accruals anomaly

In this section we examine the predictions of the investment-based catering theory with regard to the accruals anomaly. Centered to the theory is investors' sentiment rather than the fundamentals that drives management decision. Therefore, we first examine the association between the accruals anomaly and stock price mispricing. Next we investigate the relationship between the anomaly and the sensitivity of a firm's stock returns to the market-wide sentiment (i.e. the sentiment beta). Finally, we investigate whether the relationship between sentiment betas and the accruals anomaly, if any, is subsumed in the relationship between financial constraints and the anomaly documented in section 4.2.

4.3.1. Mispricing and the accruals anomaly

In this part of the paper we examine whether the accruals anomaly is more pronounced among firms that are more overpriced (hypothesis $H_{3.1}$) where the extent to which individual stock prices are overpriced is proxied by a component of M/B from its decomposition following RKRV's (2005) approach.[17] Table 2 shows that across the accruals quintiles the mispricing proxy does not follow any pattern. In Table 3, stocks are independently divided into terciles (30-40-30) by the mispricing proxy and total accruals measured at the end of December year *t-1*. The portfolios are held from July year t to June year *t+1*. In the subsample with ACCBS, the hedge return does not exhibit any monotonic pattern across the mispricing terciles. In the subsample with ACCOCF, the more overpriced the stocks are, the less pronounced the accruals anomaly. An F test (Table 3) does not reject the null of joint equality of the return to the accruals trading strategy across the mispricing terciles at 5% confidence level regardless of the total accruals proxies. The evidence does not support the conjecture that the accruals anomaly is more pronounced amongst more overpriced firm, lending no support to hypothesis $H_{3.1}$.[18]

As no evidence for the role of overpricing to the accruals anomaly is found it also casts doubt on other related mispricing explanations. For example, Fairfield et al. (2003) also find that the accruals anomaly reflects firm growth (specifically growth in net operating assets). They attribute the anomaly to investors' misinterpretation of the role of

[17] We used the same approach to extract the long term growth component for the analysis in section 4.1.
[18] In unreported results, we also test whether the accruals anomaly is more pronounced among overpriced versus underpriced stocks. When total accruals are measured by ACCBS, the return to the accruals trading strategy approximates each other in the subsamples of overpriced versus underpriced firms, which lends no support to hypothesis $H_{3.1}$. When total accruals are measured by ACCOCF, the hedged return is statistically higher among underpriced firms, which is in the opposite direction as hypothesized in $H_{3.1}$.

firm growth to firm value. We argue that the management may still cater for investor sentiment even when the stocks are not overly priced with the hope to have the stock price at as high a level as possible. In the following section we investigate the role of sentiment betas which is unique to the catering theory.

4.3.2. Sentiment beta and the accruals anomaly

Table 1 shows that firms vary widely to changes in market wide investor sentiment as the sentiment beta varies within the range of about -10 to +14. Firms with negative sentiment betas fall mostly in the bottom 25% and firms with positive sentiment betas fall mostly in the top 25%.[19] Table 2 reports that firms in the extreme accruals quintiles tend to be less sensitive (i.e. having smaller absolute value of sentiment beta) to changes in the market wide investor sentiment. Table 3 reports the return to the accruals trading strategy across the sentiment beta terciles (20-60-20).[20] In Table 3 Panel A, total accruals are measured by ACCBS. The hedged returns are higher in the extreme terciles (0.78% and 0.65% per month) than the middle tercile (0.30% per month). An F-test rejects the null of joint equality across the sentiment beta terciles at 5% level.

The accruals anomaly is more pronounced in the top 20% and bottom 20% in terms of sentiment betas where the betas are all positive and all negative respectively Table 3. It is less pronounced in the middle 60% where the sentiment betas approximate zero. The evidence therefore suggests that the accruals anomaly is more pronounced as stock prices respond to changes in the market wide sentiment, whether positively or negatively. The evidence is consistent with the catering theory to the extent that the accruals anomaly arises due to management catering for the sentiment of the firm's own investor clientele.

In Panel B (Table 3), total accruals are measured by ACCOCF. The return to the accruals trading strategy follows the same pattern across the sentiment beta terciles. The hedged returns are above 0.80% per month for both of the extreme beta tercile, 0.48% per

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[19] The sentiment beta's 25th and 75th percentile are -0.90 and 0.54 respectively.

[20] In untabulated results, we partition the stocks into terciles at the ratio of 30-40-30. The results are qualitatively similar, although an F-test does not reject the equality of the return to the accruals trading strategy across the sentiment beta tercile.

month for the middle tercile, and are all statistically significant. An F-test, however, does not reject the null that the hedged returns are equal across the sentiment beta terciles. Overall, the evidence supports a more general conjecture than hypothesis $H_{3.2}$ that the accruals anomaly is more pronounced among firms with extreme sentiment betas, both negative and positive, when total accruals are measured by ACCBS. As in section 4.2, no significant pattern is observed when total accruals are measured by ACCOCF.

4.3.3. Sentiment beta and financial constraints and the accruals anomaly

Given the evidence on the role of financial constraints documented in section 4.2 and some evidence on the role of sentiment betas documented in section 4.3.2, we now investigate whether these relationships are subsumed by each other. In Table 7, only stocks with available data to construct the proxies for both sentiment betas and financial constraints are included. Stocks are independently sorted based on total accruals (both ACCBS and ACCOCF), sentiment betas and financial constraints (total assets and payout ratio) measured at the end of December year *t-1*.[21] The portfolios are held from July year *t* to June year *t+1*. The returns to the long-short portfolios are reported.

[Insert Table 7 about here]

When total accruals are measured by ACCBS, in the subsample with total assets and sentiment betas, the return to the accruals trading strategy in the groups partitioned by sentiment betas exhibits the same pattern as documented in section 4.3.2 (hypothesis $H_{3.2}$). The hedged returns in the extreme sentiment beta terciles (0.78% per month and 0.65% per month) are higher than that in the middle tercile (0.30% per month). An F-test rejects the null of joint equality of the hedged return across the sentiment beta terciles at 5% level. Similarly, the declining pattern of the hedged return across the groups by financial constraints (from 0.90% per month to 0.28% per month) is also similar to that described in section 4.2 (hypothesis $H_{2.2}$). The null of joint equality is rejected at 1% level.

[21] We continue to partition stocks into sentiment beta terciles using the ratios of 20-60-20 given that only extreme sentiment betas affect the accruals anomaly, as documented in section 4.3.2.

Controlling for the financial constraints, the pattern of the return to the accruals trading strategy across the sentiment beta spectrum remains unchanged only in the financially constrained tercile tercile. An F-test on joint equality is significant only in this tercile (Table 7). Controlling for sentiment beta, the hedged return follows a declining trend from the financially constrained to unconstrained tercile. An F-test only rejects the null of joint equality across the financial constraint terciles among firms with high sentiment betas. The evidence suggests that the relationship between the accruals anomaly and financial constraints is relatively independent of the relationship between the anomaly and sentiment betas. As such, financial constraints and sentiment betas have a joint impact on the anomaly. The highest return to the accruals trading strategy is observed in the high financial constraint – high sentiment beta group (1.24% per month). When financial constraints are proxied by payout ratio, we only observe the pattern across the sentiment beta terciles or the financially constrained tercile individually.

When total accruals are measured by ACCOCF, qualitatively similar results are obtained (Table 7). Financial constraints and sentiment betas are not subsumed by each other when total assets are used to proxy for financial constraints. The highest hedged return is also observed in the high financial constraint – high sentiment beta group (1.42% per month). The interaction is not observed when the payout ratio is used.

In summary, we find some evidence that the accruals anomaly is more pronounced among firms with extreme negative or positive sentiment betas. However, when the effect of the firm size is controlled for only the impact of positive sentiment betas persists. The results support the catering activities of the management in the firms with stock prices co-moving positively and strongly with changes in market wide sentiment. Furthermore, the sentiment beta's impact is not subsumed by the impact of financial constraints. Hypothesis $H_{3.3}$ is rejected. The evidence is consistent with the predictions of both the q-theory and the catering theory.

The evident relationship between sentiment betas and the accruals anomaly documented so far is consistent with the predictions of the catering theory that management makes firm level decisions to cater for investors' sentiment, particularly among firms which are more sensitive to market-wide sentiment. In section 4.2 we already document that the accruals anomaly is more pronounced among financially constrained firms. Management of more financially constrained firms may find it harder to cater for investor sentiment through investment activities since financial constraints serve as a form of investment frictions. Therefore, our results so far are consistent with the view that management caters for investor sentiment but not through investment activities. Given the strong motivation for financially constrained firms to manage earnings (Linck et al., 2012) the alternative channel is catering through earnings management as in Kothari et al. (2006). However, the earnings management channel implies mispricing, which we do not find supportive evidence in section 4.3.1. Therefore, the predictions of the catering theory receive mixed support at best.

4.4. Market sentiment, business cycle and the accruals anomaly

The results so far are consistent with the predictions of the q-theory but support the catering theory only weakly. Although there is some evidence of managerial catering but is less likely through investment. In the q-theory firms react to changes in discount rates through investment. In the catering theory, management reacts to investor sentiment. Therefore, this section investigates whether the accruals anomaly can be explained by the business cycle factors (which affect the discount rate) or an asset pricing model augmented by a market wide sentiment factor.

We follow the two-stage framework of Avramov and Chordia (2006) to investigate whether the accruals anomaly can be explained by an asset pricing model. Individual stock returns are first adjusted for risks using the model in a time series regression of equation (8). The risk adjusted return, being the sum of the constant and error term from the time series regression, is regressed against the transformed accruals ratio and the control variables in a cross sectional regression of equation (9). A negative and significant coefficient attached to total accruals is evident for the accruals anomaly not explained by the asset pricing model in the first stage.

[Insert Table 8 about here]

Panel A of Table 8 reports the results when total accruals are measured by ACCBS. When returns are adjusted for risks using the CAPM, the accruals coefficient is -2.09 and significant.[22] The evidence suggests that a negative and significant relationship between total accruals and stock returns exists even when returns are adjusted for risks. The accruals anomaly is therefore not explained by the CAPM. The accruals coefficient continues to be negative and significant when returns are adjusted for risks using both Fama and French's (1996) three factor model and the Carhart (1997) four factor model.

Next, we supplement the Carhart model with the Baker and Wurgler's (2007) index of sentiment changes where the sentiment is based on the first principal component of six sentiment proxies orthogonalized with respect to macroeconomic variables. Adding the market wide sentiment factor does not help explain the accruals anomaly, as the accruals coefficient continues to be negative and significant. While investor sentiment might have certain impact on the return to the accruals trading strategy (section 4.3.2), it is insufficient to explain the accruals anomaly, rejecting hypothesis $H_{4.1}$.

Finally, we use the four factors that are commonly used to represent the business cycle and adjust the raw individual stock returns. The factors include (i) the 30-day T bill rate in %, (ii) the default spread in % between the returns of U.S. corporate bonds rated BAA and AAA, (iii) the term spread in % between the returns of 10 year Treasury bonds and 1 year Treasury bonds, and (iv) the dividend yield of the stocks listed in NYSE, AMEX, and NASDAQ, calculated as $100 \times e^{ldy}$ where *ldy* is the natural log of the imputed dividend yield taken from Jacob Boudoukh's data used in Boudoukh et al. (2007). In Boudoukh's data, *ldy* is the natural log of the imputed dividend yield calculated from value weighted returns, including and excluding distributions, for NYSE, AMEX, and NASDAQ, taken from CRSP. The accruals coefficient in the cross sectional regression is still negative but no longer statistically significant.

Qualitatively similar results to the above results are reported in panel B (Table 8) when total accruals are measured by ACCOCF. Overall, the evidence suggests that the accruals anomaly can be explained by a combination of the business cycle factors,

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[22] The coefficients attached to the control variables show the expected sign.

supporting our hypothesis $H_{4.2}$. Wu et al. (2010) report that the returns from the accruals based trading strategies can be predicted using the variance risk premium of Bollerslev et al. (2009) but less successful by using the variables that represent the business cycles (i.e. the term spread, the default spread and the relative Treasury bill rate). Our result extends the work of Wu et al. (2010) to find that the accruals anomaly can be explained by these factors in combination with firm level asset pricing framework. The result strengthens evidence consistent with the prediction of the q-theory with respect to the accruals anomaly.

5. CONCLUSION

This paper examines the patterns of the accruals anomaly from the perspective that accruals reflect firms' investment in working capital. The conjectures examined are consistent with the predictions of two theories, viz. the q-theory and the catering theory. In doing so, we examine the impact of firm growth, financial constraints and sentiment betas on the accruals anomaly. Finally, we examine whether the accruals anomaly can be explained by an augmented factor model with a sentiment factor or a combination of the widely used business cycle factors.

In this paper, the raw return to the accruals trading strategy of 0.54% (0.76%) per month based on the total accruals quintiles calculated from balance sheet (cash flow statement) is reported over the period from July 1973 to December 2010. This paper reports a positive relationship between the accruals anomaly and long term growth. The evidence corroborates with the findings of Zhang (2007) who uses employee growth as a proxy for firm growth. The long term growth proxy, following RKRV (2005), is intuitive in that it measures the difference in the firm value implied by industry average multiples and book value. Zhang (2007) does not fully explain the accruals anomaly by investigating the underlying mechanism that links firm growth with future stock returns. Our focus is on testing the predictions of the two alternative theories in the context of the relationship between the returns from the accruals based trading strategies and the firms' long term growth prospects.

This paper uses the method of Li and Zhang (2010) to test the q-theory predictions for the accruals anomaly. A negative and significant slope of excess stock returns on total accruals is reported. The slope becomes less steep as firms are less financially constrained. Extending the q-theory prediction into the portfolio context, we also report a more pronounced accruals anomaly among financially constrained firms. Furthermore, there is evidence that financial constraints and long term growth exhibit a joint impact on the accruals anomaly.

Using the mispricing proxy, which measures the difference of firms' market value relative to industry peers contemporaneously, we find no evidence on whether mispricing plays any role to the accruals anomaly. This result casts doubt on a mispricing explanation, including the catering theory with overpriced stocks and the misinterpretation of the role of growth to firm value by investors suggested by Fairfield et al.'s (2003). We argue that the management may still cater for investor sentiment even when the stocks are not overly priced with the hope to have the stock price at as high a level as possible.

The evidence supports that the accruals anomaly is more pronounced among firms with extreme negative or positive sentiment betas. However, when the effect of firm size is controlled for only the impact of positive sentiment betas persists. The results support the catering activities of the management in the firms with stock prices co-moving positively and strongly with changes in market wide sentiment. The finding that the accruals anomaly is more pronounced among financially constrained firms, however, casts doubt on management catering for investor sentiment through the investment channel as financial constraints serve as a form of investment friction. We argue that the catering is more likely channeled through earnings management as in Kothari et al. (2006), given the strong motivation for financially constrained firms to manage earnings (Linck et al., 2012). However, earnings management implies mispricing, yet we find no evidence that mispricing systematically affects the accruals anomaly. Overall, we found mixed support for the predictions of the catering theory.

Furthermore, the impacts of sentiment betas and financial constraints are not subsumed suggesting that the q-theory and the catering theory are independent in explaining the accruals anomaly. Finally, this paper finds that augmenting the multi-factor models with the market-wide sentiment factor does not help in explaining the accruals anomaly. Unlike Wu et al. (2010) we find that the accruals anomaly can be explained by combining the factors representing business cycle in a firm level asset pricing framework. The results strengthen the evidence consistent with the predictions of the q-theory.

The results also highlight the importance of the accruals measurement issue. While the results are statistically significant when total accruals are measured by ACCBS, they are not significant when ACCOCF is used. To investors wishing to pursue the accruals based trading strategies the performance can be significantly improved when the strategies are formed along the ACCBS dimension, amongst firms with high long term growth, high financial constraints, and with positive sentiment betas.

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Appendix A: Construction of Key Variables

Variable	Construction
Total accruals	
ACCBS	$ACCBS = (\Delta CA - \Delta CL - Dep)/TA$ where ΔCA measures changes in non-cash current assets, ΔCL measures changes in current liabilities excluding short-term debts and tax payables, Dep is the depreciation charge during the year, and TA is the average total assets. ACCBS is winsorized at 0.5% and 99.5%.
ACCOCF	$ACCOCF = (NI - OCF)/TA$ where NI is earnings, OCF is cash-flow from operations. TA is the average total assets. ACCBS is winsorized at 0.5% and 99.5%.
Mispricing	Following the M/B decomposition in RKRV (2005), we run the cross sectional regression of equation (5) annually for each of the 12 Fama and French industries $m_{it} = \alpha_{0jt} + \alpha_{1jt}b_{it} + \alpha_{2jt}ln(NI)^{+}_{it}$ (5) in which m and b are the natural log of the market value and the book value, NI^{+}_{it} is the absolute value of the net income of firm i during year t. $I_{(<0)}$ is the indicator when the net income is negative. LEV_{it} is the book leverage ratio of firm i during year t, measured as $\left(1 - {}^{Book\ Value\ of\ Equity}/_{Total\ Assets}\right)$. The fitted value from the regression measures the estimate of $v(\theta_{it}, \alpha_{jt})$. The regression error $m_{it} - v(\theta_{it}, \widehat{\alpha_{jt}})$ captures the mispricing relative to industry valuation.
Growth	The long term growth proxy is extracted from the M/B decomposition in RKRV (2005) described above. The estimate of $v(\theta_{it}, \alpha_j)$ is the "fitted" value from the cross sectional regression of equation (5) using the time series average of the estimated coefficients. The difference between $v(\theta_{it}, \alpha_j)$ and firm book value is the difference in the fundamental value implied by the long-run industry average multiples and the book value and captures the long-run growth.
Financial constraints	
Total assets	Total assets in USD millions, winsorized at 0.5% and 99.5%.
Payout ratio (HL)	The sum of dividends and repurchases, scaled by net income before extraordinary items, winsorized at 0.5% and 99.5%. This payout ratio is not calculated for firms with negative net income and positive distribution. These firms are included in the constrained subsample, following Hahn and Lee (2009).
Sentiment beta	The sentiment beta is estimated from the time series regression of excess stock returns on Carhart's (2007) four factors, including the excess market return, HML, SMB and UMD, plus Baker and Wurgler's (2007) index of sentiment changes as follows: $R_{jt} - R_{Ft} = \alpha_0 + \alpha_1 \times (R_{mt} - R_{Ft}) + \alpha_2 \times HML_t + \alpha_3 \times SMB_t + \alpha_4 \times UMD_t + \alpha_5 \times DSENTO_t + \varepsilon_{jt}$ (6) in which R_{jt} is the return on stock j, R_{Ft} is the risk free rate, and R_{mt} is the value weighted market return. HML_t, SMB_t, and UMD_t are the value, size and momentum factors in the Carhart four factor model. $DSENTO_t$ is Baker and Wurgler's index of sentiment changes where the sentiment is based on the first principal component of six sentiment proxies orthogonalized with respect to macroeconomic variables. The index of sentiment changes is available at http://pages.stern.nyu.edu/~jwurgler/

Table 1: Descriptive Statistics for Key Variables

This table presents descriptive statistics of the sample of non-financial, non-utilities firms listed in NYSE, AMEX, and NASDAQ. The firm level measures constructed from annual financial statements are reported from December 1972 to December 2009. Stocks must have a price of $5 and above and non-negative book value of equity to be included in the sample. Panel A reports the time series average of the statistics for the firm level variables. All variables calculated directly from firms' financial statements are winsorized at 0.5% and 99.5% level. Panel B reports the time series average of the cross sectional Spearman's correlations amongst the key firm level variables.

A: Summary statistics	ACCBS	Total assets ($b)	Payout ratio	Firm age	M/B	Mispricing	Growth	Sentiment beta	ACCOCF
Mean	-0.02	1,671	0.75	21.31	2.93	0.00	0.50	-0.11	-0.05
Standard deviation	0.09	6,346	5.19	11.60	13.34	0.61	0.46	1.61	0.13
Min	-0.68	3	0.00	2.26	0.09	-2.70	-2.20	-10.63	-1.51
25th Percentile	-0.07	86	0.05	12.13	1.05	-0.38	0.27	-0.90	-0.09
50th Percentile	-0.03	264	0.26	18.53	1.66	-0.02	0.51	-0.22	-0.05
75th Percentile	0.02	939	0.61	30.08	2.83	0.35	0.77	0.54	0.00
Max	0.73	130,282	174.76	52.37	537.65	2.88	2.77	13.63	1.94
No of firms	8,785	8,785	8,521	8,785	8,735	8,227	8,227	5,371	8,108
No of years	38	38	38	38	38	38	38	38	22

B: Correlation matrix	ACCBS	Total assets	Payout ratio	Firm age	M/B	Mispricing	Growth	Sentiment beta	ACCOCF
ACCBS	1.00								
Total assets	-0.12	1.00							
Payout ratio	-0.18	0.32	1.00						
Firm age	-0.10	0.45	0.37	1.00					
M/B	0.12	-0.08	-0.11	-0.17	1.00				
Mispricing	0.04	0.04	0.02	-0.08	0.75	1.00			
Growth	0.13	-0.18	-0.18	-0.17	0.59	0.08	1.00		
Sentiment beta	-0.02	-0.06	-0.05	-0.07	-0.02	-0.01	-0.02	1.00	
ACCOCF	0.73	-0.06	-0.16	0.01	0.01	-0.04	0.07	-0.04	1.00

Table 2: Summary Statistics of Accruals sorted Portfolios

This table presents the statistics of the equally weighted portfolios of stocks sorted in ascending order by total accruals measured at the end of year t-1 and held from July of year t to June year t+1. Panel A reports the statistics for firms with available data to construct ACCBS (1972 to 2009). Panel B reports the same statistics for firms with available data to construct ACCOCF (1988 to 2009). The first line presents the return (% per month) to the accruals sorted portfolios. The following lines report the median firm level key variables of each accruals sorted portfolio. The return to the long-short portfolio and the gap in the key variables of the low and high accruals quintiles are also reported. The t-statistics to test the equality of the median variables of the low and high accruals portfolios are also reported. The last column reports the number of observations, i.e. the firm-month observations in each subsample with sufficient data to construct the relevant firm level variables.

	Low	2	3	4	High	Low - High	t-statistics	p-value	Obs.
ACCBS subsample									
Return (%pm)	2.49	2.07	1.92	1.91	1.95	0.54	6.45	<.0001	840,915
Total assets ($b)	218	398	398	294	145	73	22	<.0001	840,915
Payout ratio	0.29	0.37	0.36	0.28	0.10	0.19	44.80	<.0001	792,484
Firm age	18.27	20.42	20.89	18.58	15.15	3.12	21.65	<.0001	840,915
M/B	1.55	1.53	1.59	1.72	1.99	-0.44	-30.55	<.0001	808,283
Mispricing	-0.02	-0.05	-0.05	-0.03	0.05	-0.06	-11.43	<.0001	722,059
Growth	0.41	0.43	0.45	0.49	0.54	-0.13	-48.87	<.0001	772,059
Sentiment beta	-0.16	-0.21	-0.26	-0.26	-0.20	0.04	8.55	<.0001	791,684
ACCOCF subsample									
Return (%pm)	2.79	2.06	1.86	1.80	2.03	0.76	6.70	<.0001	614,644
Total assets ($b)	252	441	524	435	204	48	15.90	<.0001	614,644
Payout ratio	0.21	0.36	0.36	0.27	0.08	0.13	35.67	<.0001	570,368
Firm age	16.62	19.64	22.08	20.59	17.09	-0.47	-3.02	0.0028	614,644
M/B	2.09	1.91	1.88	1.90	2.16	-0.08	-3.83	0.0002	585,925
Mispricing	0.12	-0.02	-0.05	-0.07	-0.01	0.13	16.28	<.0001	536,563
Growth	0.33	0.43	0.45	0.49	0.55	-0.22	-20.95	<.0001	536,563
Sentiment beta	-0.05	-0.22	-0.30	-0.28	-0.23	0.18	21.71	<.0001	566,927

Table 3: Growth, Mispricing and Sentiment Betas and the Accruals Anomaly

This table presents monthly returns to the equally weighted portfolios of stocks independently sorted by firm level key variables and total accruals measured at the end of year t-1. The average returns to the portfolios long in the stocks of firms with low accruals and short in the stocks of firms with high accruals within each terciles (30-40-30 for mispricing and growth, and 20-60-20 for sentiment betas) are also reported. The portfolios are held from July year t to June year t+1. The t-statistics to test the significant of the hedged returns and the F-statistic to test the joint equality of the hedged returns across the subsamples by firm characteristics are reported.

Return (%pm)	Low	2	3	4	High	Low - High	t-statistics	p-value	Obs.
ACCBS subsample									
Mispricing	1.90	1.75	1.65	1.60	1.53	0.36	4.60	<.0001	722,059
Low	2.37	2.18	1.97	1.98	1.98	0.39	4.00	<.0001	231,406
Medium	1.82	1.67	1.64	1.54	1.57	0.25	2.48	0.0135	308,848
High	1.50	1.39	1.30	1.28	1.15	0.35	2.92	0.0037	231,805
F-test							*0.50*	*0.6077*	
Growth	1.90	1.75	1.65	1.60	1.53	0.36	4.60	<.0001	772,059
Low	1.80	1.76	1.64	1.71	1.71	0.08	0.73	0.4640	231,382
Medium	1.80	1.64	1.55	1.55	1.44	0.36	3.70	0.0002	308,810
High	2.14	1.90	1.80	1.59	1.55	0.59	5.11	<.0001	231,867
F-test							*5.38*	*0.0047*	
Sentiment beta	2.31	1.98	1.82	1.79	1.83	0.47	5.86	<.0001	791,684
Low	2.68	2.21	1.99	1.88	1.90	0.78	6.2	<.0001	158,088
Medium	1.99	1.79	1.66	1.63	1.69	0.30	3.47	0.0006	475,066
High	2.79	2.39	2.24	2.19	2.14	0.65	4.36	<.0001	158,530
F-test							*3.97*	*0.0191*	
ACCOCF subsample									
Mispricing	1.94	1.71	1.56	1.50	1.52	0.42	4.46	<.0001	536,563
Low	2.60	2.17	1.92	1.83	1.86	0.74	5.20	<.0001	160,853
Medium	1.89	1.64	1.47	1.44	1.49	0.40	3.07	0.0024	214,629
High	1.49	1.36	1.31	1.19	1.17	0.32	2.24	0.0258	161,081
F-test							*2.63*	*0.0729*	
Growth	1.94	1.71	1.56	1.50	1.52	0.42	4.46	<.0001	536,563
Low	1.69	1.68	1.62	1.48	1.54	0.15	1.00	0.3197	160,824
Medium	1.74	1.67	1.35	1.42	1.37	0.38	2.74	0.0065	214,635
High	2.43	1.81	1.79	1.61	1.67	0.75	4.89	<.0001	161,104
F-test							*4.22*	*0.0150*	
Sentiment beta	2.46	1.94	1.72	1.67	1.79	0.66	6.75	<.0001	566,927
Low	2.74	2.43	1.85	1.69	1.92	0.82	4.97	<.0001	113,249
Medium	2.09	1.69	1.54	1.49	1.60	0.48	4.63	<.0001	340,192
High	3.03	2.28	2.21	2.29	2.18	0.85	4.45	<.0001	113,486
F-test							*1.65*	*0.1925*	

Table 4: Financial Constraints and the Value Premium

This table presents monthly returns to the equally weighted portfolios of stocks independently sorted by financial constraint variables and total accruals measured at the end of year t-1. The average returns to the portfolios long in the stocks of firms with low accruals and short in the stocks of firms with high accruals within each terciles (30-40-30) are also reported. The portfolios are held from July year t to June year t+1. The t-statistics to test the significant of the hedged returns and the F-statistic to test the joint equality of the hedged returns across the subsamples by financial constraints are reported.

Return (%pm)	Low	2	3	4	High	Low - High	t-statistics	p-value	Obs.
ACCBS subsample									
Total assets	2.49	2.07	1.92	1.91	1.95	0.54	6.45	<.0001	840,915
Low (High FC)	3.73	3.27	2.99	2.91	2.66	1.07	8.68	<.0001	252,064
Medium	2.11	2.00	1.82	1.70	1.54	0.58	5.83	<.0001	336,359
High (Low FC)	1.44	1.41	1.35	1.20	1.17	0.27	2.30	0.0217	252,492
F-test							*12.76*	*<.0001*	
Payout ratio	2.47	2.05	1.89	1.89	1.95	0.52	6.10	<.0001	792,484
Low (High FC)	3.20	2.81	2.68	2.58	2.62	0.58	4.50	<.0001	271,124
Medium	1.88	1.77	1.63	1.60	1.59	0.29	2.68	0.0077	324,102
High (Low FC)	1.69	1.62	1.53	1.64	1.63	0.06	0.58	0.5643	197,258
F-test							*4.95*	*0.0072*	
ACCOCF subsample									
Total assets	2.79	2.06	1.86	1.80	2.03	0.76	6.70	<.0001	614,644
Low (High FC)	4.24	3.29	3.16	2.89	2.99	1.25	7.03	<.0001	184,258
Medium	2.20	1.91	1.68	1.60	1.49	0.72	5.63	<.0001	245,863
High (Low FC)	1.46	1.35	1.30	1.14	1.13	0.33	2.05	0.0417	184,523
F-test							*8.73*	*0.0002*	
Payout ratio	2.75	2.01	1.83	1.77	2.00	0.75	6.81	<.0001	570,368
Low (High FC)	3.52	2.91	2.83	2.59	3.08	0.45	2.54	0.0115	193,233
Medium	1.71	1.68	1.56	1.60	1.59	0.12	0.90	0.3666	240,411
High (Low FC)	1.64	1.48	1.39	1.36	1.61	0.03	0.19	0.8465	136,724
F-test							*2.01*	*0.1350*	

Table 5: Growth and Financial Constraints and the Accruals Anomaly

Stocks are independently sorted by total accruals, long term growth and financial constraints (*FC*) measured at the end of December year t-1 and held from July of year t to June of year t+1. The returns (% per month) to the equally weighted accruals portfolios and the long-short portfolios are presented. The t-statistics to test the significant of the hedged returns and the F-statistic to test the joint equality of the hedged returns across the subsamples are reported.

A: Financial Constraints proxied by Total Assets

FC / Growth	**ACCBS subsample**					**ACCOCF subsample**				
Total assets	Low	Medium	High	*F-test*	Overall	Low	Medium	High	*F-test*	Overall
Small (Constrained)	0.26	0.52	0.87		0.65	0.37	0.39	0.82		0.62
t-statistic	1.36	3.58	5.22	*3.20*	6.12	1.46	2.00	3.94	*1.30*	4.84
p-value	0.1742	0.0004	<.0001	*0.0412*	<.0001	0.1463	0.0465	0.0001	*0.2719*	<.0001
Medium	0.27	0.43	0.55		0.42	0.49	0.50	0.62		0.52
t-statistic	1.92	3.32	3.36	*0.88*	4.33	2.43	2.68	2.86	*0.14*	3.96
p-value	0.0551	0.0010	0.0008	*0.4166*	<.0001	0.0156	0.0078	0.0046	*0.8681*	<.0001
Big (Unconstrained)	0.20	0.26	0.32		0.26	0.09	0.15	0.31		0.14
t-statistic	0.93	1.74	1.53	*0.09*	2.21	0.29	0.67	1.12	*0.18*	0.85
p-value	0.3532	0.0825	0.1261	*0.9149*	0.0275	0.7734	0.5037	0.2645	*0.8372*	0.3979
F-test	*0.04*	*0.89*	*2.35*		*3.20*	*0.62*	*0.80*	*1.15*		*3.22*
p-value	*0.9575*	*0.4090*	*0.0955*		*0.0412*	*0.5387*	*0.4511*	*0.3163*		*0.0406*
Overall	0.08	0.36	0.59			0.15	0.38	0.75		
t-statistic	0.73	3.70	5.11	*5.38*		1.00	2.74	4.89	*4.22*	
p-value	0.4640	0.0002	<.0001	*0.0047*		0.3197	0.0065	<.0001	*0.0150*	

B: Financial Constraints proxied by Payout Ratio

FC / Growth	**ACCBS subsample**					**ACCOCF subsample**				
Payout ratio	Low	Medium	High	*F-test*	Overall	Low	Medium	High	*F-test*	Overall
Low (Constrained)	-0.11	0.44	0.73		0.39	-0.01	0.39	0.74		0.34
t-statistic	-0.58	2.23	4.05	*5.12*	3.47	-0.05	1.28	2.44	*1.70*	2.12
p-value	0.5620	0.0265	<.0001	*0.0061*	0.0006	0.9602	0.2025	0.0152	*0.1841*	0.0347
Medium	0.03	0.28	0.35		0.27	0.02	0.07	0.21		0.14
t-statistic	0.14	2.06	2.17	*1.00*	2.59	0.07	0.36	0.95	*0.15*	0.99
p-value	0.8866	0.0398	0.0305	*0.3683*	0.0099	0.9414	0.7158	0.3454	*0.8605*	0.3208
High (Unconstrained)	0.06	0.25	0.05		0.15	-0.09	0.05	0.33		0.09
t-statistic	0.32	1.59	0.23	*0.35*	1.36	-0.33	0.27	1.29	*0.76*	0.60
p-value	0.7488	0.1121	0.8183	*0.7016*	0.1741	0.7419	0.7904	0.1984	*0.4667*	0.5498
F-test	*0.22*	*0.38*	*3.23*		*1.21*	*0.04*	*0.62*	*1.17*		*0.77*
p-value	*0.8049*	*0.6827*	*0.0401*		*0.2975*	*0.9607*	*0.5378*	*0.3108*		*0.4619*
Overall	0.04	0.36	0.60			0.15	0.41	0.75		
t-statistic	0.38	3.60	5.03	*6.08*		0.98	2.90	4.84	*4.04*	
p-value	0.7010	0.0004	<.0001	*0.0023*		0.3289	0.0041	<.0001	*0.0180*	

Table 6: Slope in the Fama and MacBeth regressions in subsamples by financial constraints

Stocks are sorted into terciles by financial constraint variables measured at the end of year t-1. This table reports the time series average of total accruals coefficient in the Fama and MacBeth cross sectional regression of monthly excess stock returns on total accruals from July of year t to June of year t+1. The results from the regression with and without the control variables in the following equation are reported:

$$R_{jt} - R_{Ft} = a_{0t} + a_{1t} \times ACC_{j,t-1} + \sum_{i=1}^{8} b_{it}\, Controls_{ijt-1} + e_{jt} \quad (7)$$

The autocorrelation and heteroskedasticity corrected Newey and West (1987) t-statistics on total accruals and the t-statistics testing that a given slope is equal across the extreme terciles are also reported.

	Without control variables			*With control variables*		
A: ACCBS	Coefficient	t-statistic	p-value	Coefficient	t-statistic	p-value
Total assets						
Overall	-2.14	-5.33	<.0001	-2.23	-6.68	<.0001
Small (Constrained)	-3.28	-6.63	<.0001	-2.37	-5.98	<.0001
Medium	-2.68	-6.56	<.0001	-2.08	-5.23	<.0001
Big (Unconstrained)	-1.24	-2.21	0.0277	-0.89	-1.83	0.0683
Constrained - Unconstrained	*-2.04*	*-2.81*	*0.0051*	*-1.48*	*-2.33*	*0.0199*
Payout ratio						
Overall	-2.19	-5.34	<.0001	-2.27	-6.55	<.0001
Low (Constrained)	-2.62	-4.73	<.0001	-2.15	-4.19	<.0001
Medium	-1.08	-2.78	0.0057	-1.50	-4.26	<.0001
High (Unconstrained)	-0.88	-1.51	0.1316	-1.20	-2.21	0.0274
Constrained - Unconstrained	*-1.74*	*-2.48*	*0.0134*	*-0.95*	*-1.45*	*0.1486*
B: ACCOCF						
Total assets						
Overall	-2.04	-4.46	<.0001	-2.01	-5.47	<.0001
Small (Constrained)	-2.84	-4.51	<.0001	-2.61	-4.81	<.0001
Medium	-1.89	-4.50	<.0001	-1.96	-4.83	<.0001
Big (Unconstrained)	-1.85	-3.06	0.0024	-1.57	-3.01	0.0028
Constrained - Unconstrained	*-0.99*	*-1.21*	*0.2275*	*-1.04*	*-1.37*	*0.1703*
Payout ratio						
Overall	-1.94	-4.41	<.0001	-1.90	-5.22	<.0001
Low (Constrained)	-1.28	-2.30	0.0222	-1.59	-3.11	0.0021
Medium	0.12	0.22	0.8294	-0.47	-1.01	0.3116
High (Unconstrained)	-0.80	-1.14	0.256	-1.04	-1.50	0.1359
Constrained - Unconstrained	*-0.48*	*-0.61*	*0.5444*	*-0.55*	*-0.72*	*0.4710*

Table 7: Sentiment Beta and Financial Constraints and the Accruals Anomaly

Stocks are independently sorted by total accruals, sentiment betas and financial constraints (*FC*) measured at the end of December year t-1 and held from July of year t to June of year t+1. The returns (% per month) to the equally weighted accruals portfolios and the long-short portfolios are presented. The t-statistics to test the significant of the hedged returns and the F-statistic to test the joint equality of the hedged returns across the subsamples are reported.

A: Financial Constraints proxied by Total Assets

FC / Sentiment beta	**ACCBS subsample**					**ACCOCF subsample**				
Total assets	Low	Medium	High	*F-test*	Overall	Low	Medium	High	*F-test*	Overall
Small (Constrained)	0.96	0.61	1.24		0.90	0.81	0.70	1.42		1.03
t-statistic	4.27	4.52	5.89	*2.69*	7.97	2.63	4.05	5.00	*2.27*	6.73
p-value	<.0001	<.0001	<.0001	*0.068*	<.0001	0.0090	<.0001	<.0001	*0.1044*	<.0001
Medium	0.79	0.44	0.44		0.53	0.83	0.56	0.67		0.63
t-statistic	4.80	4.22	2.11	*1.52*	5.38	3.79	4.11	2.58	*0.41*	5.18
p-value	<.0001	<.0001	0.0355	*0.2191*	<.0001	0.0002	<.0001	0.0104	*0.6614*	<.0001
Big (Unconstrained)	0.60	0.26	0.09		0.28	0.59	0.41	0.31		0.43
t-statistic	2.32	1.99	0.33	*1.25*	2.41	1.89	2.81	0.66	*0.17*	2.73
p-value	0.0208	0.0474	0.7397	*0.2866*	0.0164	0.0599	0.0054	0.5108	*0.8462*	0.0068
F-test	*0.64*	*1.98*	*6.35*		*7.77*	*0.22*	*0.90*	*2.56*		*4.46*
p-value	*0.5257*	*0.1385*	*0.0018*		*0.0004*	*0.8009*	*0.4082*	*0.0776*		*0.0119*
Overall	0.78	0.30	0.65			0.82	0.48	0.85		
t-statistic	6.20	3.47	4.36	*3.97*		4.97	4.63	4.45	*1.65*	
p-value	<.0001	0.0006	<.0001	*0.0191*		<.0001	<.0001	<.0001	*0.1925*	

B: Financial Constraints proxied by Payout Ratio

FC / Sentiment beta	**ACCBS subsample**					**ACCOCF subsample**				
Payout ratio	Low	Medium	High	*F-test*	Overall	Low	Medium	High	*F-test*	Overall
Low (Constrained)	0.72	0.39	0.44		0.48	0.55	0.41	0.29		0.41
t-statistic	3.38	2.61	2.04	*0.86*	3.96	1.75	1.94	0.97	*0.23*	2.45
p-value	0.0008	0.0092	0.0416	*0.4244*	<.0001	0.0807	0.0535	0.3346	*0.7985*	0.0149
Medium	0.47	0.18	0.37		0.29	0.60	0.10	0.32		0.27
t-statistic	2.46	1.55	1.62	*0.65*	2.69	2.27	0.63	1.09	*1.06*	1.96
p-value	0.0142	0.1211	0.1050	*0.5228*	0.0074	0.0243	0.5313	0.2764	*0.3472*	0.0510
High (Unconstrained)	0.10	0.02	0.02		0.08	-0.40	0.12	0.24		0.05
t-statistic	0.35	0.13	0.06	*0.04*	0.75	-1.27	0.77	0.63	*1.27*	0.35
p-value	0.7266	0.8944	0.9508	*0.9635*	0.4514	0.2035	0.4442	0.5299	*0.2815*	0.7299
F-test	*1.81*	*2.03*	*0.84*		*3.11*	*3.51*	*0.97*	*0.02*		*1.41*
p-value	*0.1636*	*0.1314*	*0.4315*		*0.0451*	*0.0303*	*0.3778*	*0.9830*		*0.2448*
Overall	0.73	0.31	0.58			0.83	0.53	0.73		
t-statistic	5.67	3.49	4.08	*2.98*		5.07	4.88	4.06	*1.01*	
p-value	<.0001	0.0005	<.0001	*0.0511*		<.0001	<.0001	<.0001	*0.3647*	

Table 8: Explaining the Accruals Anomaly with Avramov and Chordia (2006) framework

In stage one, the time series regression uses (a) the CAPM, (b) the Fama and French three factor model, (c) the Carhart four factor model, (d) the Carhart model augmented with the Baker and Wurger's (2007) changes in sentiment, and (e) the four business cycle factors (risk free rate, default spread, term spread, and dividend yield) as the base model in the general model specification described in equation (8). The part of returns unexplained by the asset pricing model in equation (8) is regressed against the accrual ratio described in equation (9). The autocorrelation and heteroskedasticity corrected t-statistics following Newey and West (1987) are also reported.

	A: ACCBS					B: ACCOCF				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Total Accruals	-2.09	-1.92	-1.66	-2.23	-6.26	-1.55	-1.27	-1.33	-2.83	-2.73
t-statistic	-6.60	-3.78	-3.03	-3.00	-1.28	-4.93	-3.60	-3.21	-2.38	-0.33
p-value	<.0001	0.0002	0.0026	0.0029	0.2008	<.0001	0.0004	0.0015	0.0181	0.7385
M/B	-0.29	-0.08	-0.09	-0.05	0.66	-0.17	-0.03	0.00	-0.19	5.76
t-statistic	-4.21	-0.92	-1.10	-0.60	0.83	-2.20	-0.43	0.03	-0.57	1.51
p-value	<.0001	0.3569	0.2730	0.5457	0.4053	0.0284	0.6702	0.9782	0.5674	0.1321
Size	-0.36	-0.35	-0.35	-0.38	-1.73	-0.43	-0.42	-0.43	-0.43	-2.79
t-statistic	-9.06	-9.74	-9.64	-8.69	-7.34	-8.04	-11.73	-12.22	-4.31	-3.18
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0016
Cumulative return months 2 - 3	0.59	0.82	0.89	0.78	-5.54	0.17	0.29	0.32	0.20	-9.32
t-statistic	2.31	2.97	3.25	2.56	-1.55	0.59	0.99	1.09	0.54	-1.52
p-value	0.0211	0.0032	0.0012	0.0108	0.1207	0.5549	0.3238	0.2769	0.5926	0.1302
Cumulative return months 4 - 6	0.45	0.51	0.49	0.39	-2.10	0.51	0.67	0.69	0.01	-2.24
t-statistic	2.17	2.47	2.41	1.60	-0.98	1.97	2.81	2.84	1.37	-0.42
p-value	0.0308	0.0137	0.0162	0.1114	0.3276	0.0495	0.0053	0.0048	0.1732	0.6778
Cumulative return months 7 - 12	0.33	0.27	0.21	0.22	0.73	-0.14	-0.13	-0.33	-0.23	-3.12
t-statistic	2.20	1.75	1.34	1.35	0.81	-0.91	-0.80	-1.55	-0.81	-1.04
p-value	0.0281	0.0801	0.1825	0.1792	0.4199	0.3638	0.4268	0.1220	0.4181	0.2980
Turnover-NASDAQ	-0.01	0.05	0.05	0.09	1.77	0.06	0.08	0.09	0.21	1.67
t-statistic	-0.15	0.88	0.87	1.13	4.01	0.70	1.02	1.05	1.51	2.02
p-value	0.8809	0.3814	0.3844	0.2589	0.0001	0.4857	0.3077	0.2950	0.1310	0.0439
Turnover-NYSE AMEX	0.0670	0.0789	0.1024	0.1288	1.0767	0.17	0.17	0.22	0.20	1.60
t-statistic	1.2035	1.5599	2.0685	2.4516	5.0775	2.37	2.76	3.89	2.54	1.85
p-value	0.2294	0.1195	0.0392	0.0146	<.0001	0.0183	0.0061	0.0001	0.0118	0.0652
NASDAQ	0.14	0.21	0.22	0.24	4.51	0.26	0.39	0.36	0.35	2.82
t-statistic	1.24	2.39	2.50	2.78	6.18	1.61	3.52	3.39	2.72	0.89
p-value	0.2139	0.0173	0.0126	0.0056	<.0001	0.1088	0.0005	0.0008	0.0069	0.3722
Intercept	0.79	0.58	0.67	0.71	5.50	0.91	0.74	0.87	0.90	10.28
t-statistic	5.69	7.13	8.89	8.49	9.96	4.55	6.78	9.19	5.69	4.31
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Adjusted R-squared	0.0381	0.0232	0.0222	0.0213	0.0291	0.0316	0.0204	0.0197	0.0191	0.0257