The accrual anomaly and the working capital - investment dynamics

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Abstract

Given the evidence from the literature about the link between the accrual anomaly and information about firms' investment, we investigate whether the accrual anomaly exhibits any cyclical behaviour and how the dynamics between the fixed capital investment and working capital investment affects such cyclicality. We find the evidence that financial inflexibility reinforces the impact of investment inflexibility on firms, which leads to the cyclicality of the accrual profit. Financial flexibility, however, does not have a significant impact on the accrual profit among firms with high in investment flexibility. Together with the evidence that all the behaviours observed in the pooled sample are concentrated in the manufacturing industries in which the nature of investment and financing activities are most relevant, the evidence suggests that the accrual anomaly is related to the fundamental information at firm level and influenced by the business cycle. Finally, we find that a macroeconomic model is capable of capturing the accrual anomaly at firm level after controlling for other well documented anomalies.

***Keywords**: accruals, investment, anomaly, financial constraint, investment irreversibility*

Introduction

Sloan (1996) documents an interesting finding that the strategy to buy stocks of firms with low accounting accruals and sell stocks of firms with high accounting accruals generates positive and significant profits. The possibility to generate excess returns using the accrual information is referred to as the accrual anomaly, a robust anomaly among several anomalies examined in Fama and French (2007). Sloan (1996) attributes the accrual anomaly to investors failing to recognise that the accrual component of earnings is less persistent than the cash component; hence the subsequent realised earnings fail to meet investor expectation. Subsequent to Sloan's paper, research has been focusing on a variety of aspects of the accrual anomaly. Chan, Chan, Jegadeesh and Lakonishok (2006) provide evidence that accrual is a measure of earnings management. Another branch of the accrual literature is built around the idea that higher accrual reflects an aspect of firm growth and the accrual anomaly arises due to investors' failure to recognise the true contribution of growth to firm value. Zhang (2007), Fairfield et al. (2003), Wei and Xie (2008), and Wu, Zhang and Zhang (2008) find evidence that the accrual anomaly is related to the growth of firms, however, the studies do not address the specific mechanism that links firms' growth with the accrual anomaly or future stock returns.

As firms' growth is rooted from firms' investment in fixed capital and working capital, and these investments vary across the business cycle, to shed light into the linkage between firms' growth and the accrual anomaly, this paper examines whether the accrual anomaly exhibits any cyclical behaviour and how the dynamics between the fixed capital investment and working capital investment affects such cyclicality. The paper contributes to the literature in two ways. First, it is the first to study the cyclicality of the accrual anomaly and the fundamental drivers within firms' investment and financing environments that could give rise to the cyclicality. Second, it provides the evidence that an asset pricing model consisting of macroeconomic variables could capture the accrual anomaly at firm level after controlling for other well documented asset pricing anomalies, whereas the multifactor models, both in unconditional and conditional forms, are incapable of doing so.

We first report that in our sample, stocks with low accrual earning higher returns than stocks with high accrual. Next, we find that the accrual profit from an accrual strategy that goes long in low accrual stocks and goes short in high accrual stocks is cyclical. The accrual profit is always higher during upturns than during downturns, a result that is robust in the pooled sample and in all subsamples by investment irreversibility, financial constraint, or both. The evidence suggests the necessary, though not the sufficient condition, that low accrual stocks have higher risks than high accrual stocks. It is also against the prediction by the earnings management explanation that the accrual anomaly should be stronger during downturns and weaker during upturns as management are under greater pressure during downturns to manage firms' earnings.

We then investigate how the dynamics between fixed capital and working capital investment gives rise to the cyclicality of the accrual profit. According to Caggese (2007), working capital is inefficiently low during downturn as it is more difficult for firms to cut back fixed investment than working capital. It is particularly the case if firms' assets are highly irreversible. If firms are also subject to financial constraint, the financial constraint will intensify the effect of investment irreversibility on firms' investment and disinvestment. They also argue that financial constraint can force firms to cut back fixed investment and working capital in downturn, and if firms' fixed investment is highly irreversible, their working capital is expected to be inefficiently low. It is therefore expected that the cyclicality of the return from the accrual investment strategy is stronger among firms with high than among those with low investment irreversibility. Similarly, it is also expected to be stronger among firms with high financial constraint than those with low financial constraint. Finally, when both frictions are binding, the cyclicality is expected to be stronger than when one or none of the friction is binding.

We find the evidence that the accrual anomaly is more cyclical among firms with low investment irreversibility than among firms with high investment irreversibility. This appears to be in contrast with the prediction in light of the mechanism by Caggese (2007). Next we find the evidence that the accrual anomaly is more cyclical among firms with high financial constraint than among firms with low financial constraint. This evidence is supportive of the prediction in light of the mechanism by Caggese (2007). We further investigate the combined influence of investment irreversibility and financial constraint to the cyclicality of the accrual profit and find that the behaviour of the accrual profit in the four subsamples by investment irreversibility and financial constraint can explain for the behaviour of the accrual profit in the high vs. low investment irreversibility that was at odd with our expectation. The subsamples of firms with high investment irreversibility generate the highest and lowest accrual profit in terms of both statistical and economic significance depending on the financial constraint status. In aggregate, the significance of the accrual profit of firms with high investment irreversibility and high financial constraint is neutralised by the insignificance of the accrual profit of firms with high investment irreversibility but low financial constraint. On the other hand, when firms have flexibility in investment, i.e. low investment irreversibility, the financial constraint status does not considerably affect the accrual profit – it remains statistically and economically significant with the same magnitude.

The evidence suggests that in accordance with the implication from the mechanism by Caggese (2007), financial inflexibility reinforces the impact of investment irreversibility on firms. This relationship leads to the cyclicality of the accrual profit, i.e. the higher performance of the accrual strategy during upturns as compared to its performance during downturns. It also leads to the strongest accrual profit among firms that are subject to both financing and investment inflexibility. However, financial inflexibility does not have a significant impact on the accrual profit among firms with high investment flexibility. Together with the evidence that all the behaviours observed in the pooled sample are concentrated in the manufacturing industries in which the nature of investment and financing activities are most relevant, the interaction between financing and investment inflexibility on the accrual profit suggests that the accrual anomaly is related to the fundamental information at firm level, which is influenced by the cycle in the macroeconomic environment.

If the accrual is related to the fundamental information, one could expect that the accrual anomaly can be priced by an appropriate asset pricing model. We find that the CAPM and the related multifactor models are incapable of capturing the accrual anomaly at firm level when controlling for the well documented anomalies, i.e. value, size, momentum and liquidity effects. On the other hand, the business cycle model consisting of Treasury bill rate, default spread, term spread and dividend yield is capable of capturing completely the accrual anomaly at firm level when the other effects are controlled for. This evidence is consistent with our other findings that the accrual profit is related to the fundamental activities at firm level, which in turn is influenced by the business cycle.

Literature review

Sloan (1996) documents an interesting finding that the strategy to buy stocks of firms with low accounting accruals and sell stocks of firms with high accounting accruals generates positive and significant profits in one to three years from the portfolio formation date. This finding is referred to as the accrual anomaly, a robust anomaly among several anomalies examined in Fama and French (2007). Subsequent to Sloan's paper, research has been focusing on a variety of aspects of the accrual anomaly. With regard to the underlying mechanism that gives rise to the accrual anomaly, Sloan (1996) first argues that the accrual anomaly can be explained by the functional fixation hypothesis. This hypothesis means that investors fail to recognise that the accrual component of earnings is less persistent than the cash component. If they value stocks based on the expectation that earnings, regardless of whether it is cash based or accrual based, will continue to grow in the future, the subsequent realisation of earnings will fall short of their expectation due to the weaker persistence of the cash component of earnings. The failure to meet investor earnings expectation explains for the lower subsequent returns of high accrual stocks.

Another branch of the accrual literature is built around the idea that higher accrual reflects an aspect of firm growth and the accrual anomaly arises due to investors' failure to recognise the true contribution of growth to firm value. Firms' growth is rooted from their investment in both fixed capital and working capital investment, or the growth of total assets. If accrual is viewed as firms' investment in working capital, then the negative association between accrual and stock returns might reflect an aspect of the negative association between fixed capital investment and stock returns documented in the literature. Titman et al. (2004) attribute this negative relationship to over-investment due to management empire building motivation and investors' failure to capture this motivation in their expectation. This negative relationship can also be explained by the error-in-expectation hypothesis along the line of Lakonishok et al. (1994) whereby investors extrapolate past high growth into the future and are overoptimistic about the future growth. Cooper et al. (2008) study the association of the total asset growth and the subsequent negative stock returns. They find evidence consistent with both the over-investment hypothesis in Titman et al. (2004) and the over-extrapolation hypothesis in Lakonishok et al. (1994). They report that the negative relationship between total asset growth and subsequent return is weaker during the periods of heightened corporate oversight, suggesting the management overinvestment associated with investor underappreciation of managerial empire building as argued in Titman et al. (2004). They also find that investors appear to overreact to past firm growth rates, consistent with the over-extrapolation hypothesis of Lakonishok et al. (1994).

With regard to the specific relationship between accrual and subsequent stock return, however, Wu, Zhang and Zhang (2008) do not find the evidence that the accrual anomaly is stronger among firms with weak corporate governance environment, contradicting the implication in favour of Titman et al. (2004) over-investment due to managerial empire building in the evidence provided by Cooper et al. (2008). Furthermore, with regard to the growth signal embedded in the accrual measure, Chan, Chan, Jegadeesh and Lakonishok (2006) do not find supportive evidence for the hypothesis that accruals reflect strong past growth, and the accrual anomaly arises due to managers accumulating inventories and other working capital items to anticipate high future growth, and make errors in extrapolating past high growth into the future. The authors argue that if the accrual anomaly is driven by changes in the business conditions, then it should be roughly uniform across accrual components and industries. They report that the predictability of accounts receivable and inventory are different, and the accrual effect varies in different industries. Thomas and Zhang (2002) also find that inventory contribute the majority of the predictive power of the accrual measures.

On the other hand, Zhang (2007) finds the evidence that the accrual anomaly is related to the growth characteristics of firms such as employment growth, however, the study does not address the specific mechanism that links firms' growth with the accrual anomaly or future stock returns. Fairfield et al. (2003) provides the evidence of the negative relationship between accruals and firms' fixed capital investment with future profitability, and the evidence that the relationship between accruals and future stock returns is related to the relationship between firms' investment and future stock returns. This study supports that accruals is related to firms' investment and attributes the accrual anomaly to investor irrationality in failing to understand the implication of diminishing marginal return of investment and conservative accounting practice.

The test of the contribution of fixed capital investment and accruals to future stock returns, which is missing in both Fairfield et al. (2003) and Zhang (2007), is performed in Wei and Xie (2008). The study provides the evidence that the negative relationship between fixed capital investment and stock returns is related to the negative relationship between accrual and stock returns. However, the two relationships are not subsumed in each other. Wu, Zhang and Zhang (2008) also report that the magnitude of the accrual anomaly reduces but it is not eliminated after controlling for investment. Wei and Xie (2008) attribute the mechanism that at the same time makes firms' investment and accruals related to overinvestment due to management's over-optimism about future demands for the firm's products. However, the authors are silent about how the interaction between fixed capital investment and working capital investment within firms affects the returns in the stock market. This is also the drawback in Zhang (2007) and Fairfield et al. (2003).

Wu, Zhang and Zhang (2008) propose the discount hypothesis to explain the accrual anomaly. The authors argue that the accrual anomaly arise as management rationally adjust firms' investment as the discount rate changes. If accruals reflect investment in working capital, then when the discount rate is lower, current returns increase and future expected returns decrease while investment and accruals increase as there are more investment projects becoming profitable. Hence accruals should be positively related to current returns and negatively related to future returns. The authors further argue that if investments take longer than one period to complete, accruals should also be positively correlated with past returns. However, according to Lamont (2000, p. 2720), if investment is lagged, investment growth should be positively related with past returns, negatively related with current returns and independent of future returns[1]. Wu, Zhang and Zhang (2008) report that accruals are negatively related to future returns, and positively related to past and current returns. On the other

[1] This is because when the discount rates decline, investment plans are changed to adjust to the changes in the discount rates, and the stock prices at this time increase to reflect the expected added value of the investment plans to the value of the firm. The actual new investment occurs in the following period, when the expected return is low subsequent to the decline in the discount rates. The relationship becomes insignificant in the period following the actual investment.

hand, Lamont (2000, p. 2719) reports that investment and stock returns have a negative contemporaneous relationship in aggregate term. The evidence on the discount hypothesis is therefore inconclusive.

Chan, Chan, Jegadeesh and Lakonishok (2006) suggest the earnings management explanation. While the functional fixation hypothesis in Sloan (1996) attributes the accrual anomaly to investor irrationality and is silent about the role of firms' management, according to Chan, Chan, Jegadeesh and Lakonishok (2006), management plays a central role to the existence of the accrual anomaly by inflating reported earnings through increasing the accrual components of it. According to Chan et al. (2006), there have been several studies that provide the evidence that management in fact do manipulate earnings. Chan et al. (2006) reports that firms that have high stock returns and high earnings growth subsequently increase accruals suddenly. Following the increase in accrual are tumbling earnings and stock prices. The authors attribute this evidence to management trying to delay reporting the slow growth by manipulating earnings through accruals.

To conclude, the link between (a) the relationship between fixed capital investment and stock returns and (b) the relationship between accruals and stock returns is evidenced in the literature. However, this relationship is not a simple direct one, as the accrual anomaly is not subsumed in the investment anomaly. Moreover, the earnings management hypothesis also has supportive evidence from the literature. However, if the earnings management hypothesis is solely responsible for the existence of the accrual anomaly, it is difficult to establish how this hypothesis can account for the influence of the accrual anomaly by firms' fixed capital investment. This paper aims to contribute to the literature by investigating how the dynamics between fixed capital and working capital investments affects the accrual anomaly. Our proposed testable hypotheses are developed in the following session.

Hypothesis development

The literature suggests that the link between (a) the relationship between fixed capital investment and stock returns and (b) the relationship between accruals and stock returns can be more dynamic than the positive relationship implied by firms' growth through investment in both fixed capital and working capital. Caggese (2007) suggests a mechanism on how fixed capital and working capital levels vary in different stages of the business cycle. At the beginning of a downturn, firms might want to downside their fixed capital but are prevented from doing so as fixed capital tends to be difficult to reverse, i.e. having high degree of irreversibility. As the downturn continues, revenue becomes worsen. If firms also face financial constraint, they may be forced to cut the investment in working capital. When the downturn ends, firms would be more cautious about increasing their fixed capital. As a result, during downturns, firms that face investment irreversibility, or investment irreversibility and financial constraint, would have fixed investment at an inefficiently high level and working capital at an inefficiently low level. During upturns, fixed investment might be inefficiently low.

If Caggese's (2007) mechanism holds, the relationship between working capital investment and fixed capital investment is influenced by the business cycle. The negative relationship between working capital investment (or accrual) and stock returns is not simply a reflection of the negative relationship between fixed capital investment and stock returns. It is likely to be influenced by the business cycle, especially among firms with high degree of investment irreversibility or investment irreversibility and financial constraint. We could expect that during the downturn, the accrual anomaly would be weaker. This is because the working capital is inefficiently low; hence firms with higher working capital or higher accrual should be rewarded. Therefore the mechanism in Caggese (2007) will predict that the accrual profit is cyclical with higher returns during upturns than in downturns. In short, our ***first hypothesis*** is that the accrual profit is cyclical. The mechanism that suggests a dynamic relationship between fixed capital and working capital by Caggese (2007) suggests that the accrual profit is higher in upturns and lower in downturns.

Next, the mechanism in Caggese (2007) would predict that the cyclicality that it predicts in the first hypothesis is stronger among firms with high investment irreversibility and weaker among firms with low investment irreversibility. This is because firms with assets which are highly irreversible would find it harder than firms with flexible assets to cut back their fixed capital investment during downturns and expand during upturns. Hence the working capital level of the former is more likely to be at the inefficient level than that of the latter. As the mechanism in Caggese (2007) predicts the cyclicality of the accrual profit to arise from inefficient accrual level, firms with high investment irreversibility are expected to experience an even more cyclical behaviour of the accrual profit among them than firms with low investment irreversibility would do. Our ***second hypothesis*** derived from the mechanism in Caggese (2007) is that the cyclicality of the accrual profit is stronger among firms with high investment irreversibility and weaker among firms with low investment irreversibility.

Similar to its prediction with regard to the cyclicality of the accrual profit, the mechanism in Caggese (2007) suggests that the cyclicality that it predicts in the first hypothesis is stronger among firms with high financial constraint and weaker among firms with abundant financial resources. This is because during downturns, firms with high financial constraint will be subject to more pressure to cut back their investment in both fixed capital and working capital. Therefore, the working capital level of these firms will be more likely to be at the inefficient level than of firms with financial resources. As the mechanism in Caggese (2007) predicts the cyclicality of the accrual profit to arise from inefficient accrual level, firms with high financial constraint are therefore expected to experience an even more cyclical behaviour of the accrual profit among them than firms with financial resources would do. Our ***third hypothesis*** derived from the mechanism in Caggese (2007) is that the cyclicality of the accrual profit is stronger among firms with high financial constraint and weaker among firms with abundant financial resources.

Finally, we establish the hypotheses with regard to the cyclicality of the accrual profit in the presence of both investment irreversibility and financial constraint based on the predictions when each condition is present. The ***fourth hypothesis*** based on the mechanism of Caggese (2007) is that the accrual profit is expected to be most cyclical when both investment irreversibility and financial constraint are binding, i.e. high investment irreversibility and high financial constraint.

Data and variables

This paper uses stocks which are non-financial and non-utilities stocks, listed in the NYSE, AMEX and NASDAQ stock exchanges, during the time period of 1972 – 2006. We only include stocks that have sufficient data to construct the variables of interest. We follow Jegadeesh and Titman (2001) to exclude firm month observations with stock price below $5 or market value falling within the smallest NYSE size decile. According to Jegadeesh and Titman, the purpose is to avoid our results to be driven by small and illiquid stocks or bid-ask bounce. We sort stocks into deciles or quintiles from July year t to June year t+1 based on the financial ratios measured in December year t to ensure the availability of information to investors at the time they make the investment decision.

To measure accrual, we follow Sloan (1996) and take changes in non-cash current assets minus changes in current liabilities (excluding short term debts and tax payable) and depreciation, scaled by average total assets. To test the role of financial constraint, net payout ratio is used. Almeida and Campello (2007) use payout ratio together with credit ratings of bonds and commercial papers and total assets to proxy for financial constraint. According to Hahn and Lee (2009), these criteria reflect the financial constraint in terms of external funds available for borrowing rather than the higher cost of borrowing, with the former being more relevant than the latter according to Jaffee and Russell (1976), Stiglitz and Weiss (1981), and Greenwald et al. (1984). Compared with the other alternative measures in Almeida and Campello (2007), payout ratio is a more direct and straight forward measure of the ability of a firm to mobilise funds. Hence this paper uses payout ratio to proxy for financial constraint. In the light of Boudoukh et al. (2007), we use net payout ratio, i.e. the sum of dividends and stock repurchase minus share issuance, scaled by net income.

To measure the extent to which firms' assets are irreversible, we follow the industrial economics literature. Kessides (1990) recommended a proxy for industry level sunk costs, consisting of three components – the portion of capital which can be rented (negatively correlated with the level of irreversibility), the extent to which fixed assets have depreciated (negatively correlated), and the intensity of the second-hand market for the capital employed (negatively correlated). Farinas and Ruano (2005) modified the industry-level measure in Kessides (1990) to three separate firm-level measures: a dummy of 1 for firms renting at least part of their capital and 0 otherwise, the ratio of depreciation charged during the year / total fixed assets, and the ratio of proceeds of fixed asset sale / total fixed assets. Given that accumulated depreciation provides a source of finance for reinvesting to all firms, and the availability of data, we choose the depreciation charge rate as the proxy for firm level asset irreversibility. To avoid the effect of fully depreciated assets being included in the firm's balance sheet, we replace the denominator of total fixed assets in Farinas and Ruano (2005) with beginning of the year net fixed assets.

To investigate the accrual investment strategy in different business cycle stages, we use the Chicago Fed National Activity Index, a weighted average of 85 existing monthly national economic indicators with the mean of zero and the standard deviation of one. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. Therefore we assign positive index to upturns and negative index to downturns[2]. For further details on the construction of the key variables, refer to the Appendix.

The sample with available information to construct the accrual, depreciation charge and net payout ratio variables has 540,583 firm-month observations, covering 5,549 firms and 420 months from January 1972 to December 2006. The descriptive statistics of the sample are presented in Table 1. The firm level variables have high dispersion and very low correlation level with one another, which suggests that they reflect different firm level information.

[Table 1 about here]

The results

The existence of the accrual effect

The first column of table 2 presents the raw returns of ten equally weighted portfolios of stocks formed based on the rankings of the accrual in December year t-1 and held from July year t to June year t+1. This table investigates whether investors can benefit from the information about firms' accrual in forming their investment strategies. All accrual deciles earn positive and significant returns.

[2] Caggese (2007) also differentiate upturns and downturn based on whether sales are above or below the trend.

Furthermore, the portfolio that goes long in low accrual stocks and goes short in high accrual stocks earns on average 0.53% per month with statistical significance. The evidence suggests that stocks with low accrual generate higher raw returns than stocks with high accrual, and hence investors can benefit from investing in stocks with low accrual. This result is consistent with Sloan (1996) and subsequent studies about the accrual anomaly.

[Table 2 about here]

The hypotheses in this paper are built around the relationship between the impacts of firms' investment and financing constraints on the accrual profit. The relationship might vary across the industries as firms in different industries tend to face different constraints in investment and financing. In panel A of Table 3, we test the accrual strategy in one-digit SIC industries. The accrual profit is positive and statistically highly significant only in two industries 2 and 3, i.e. light and heavy manufacturing industries. In the other industries the accrual profit is non-existent[3]. The evidence is supportive to the potential role of the nature of fixed investment to the accrual anomaly given that it is more likely to affect the manufacturing industries than the other industries. Furthermore, our evidence supplements the findings in Zhang (2007). Zhang (2007) documents that the accrual profit increases monotonically with the covariance between the accrual and the employment growth at two-digit SIC industry level. We report that in our sample, the accrual profit is ***only*** statistically and economically significant among firms in the light and heavy manufacturing industries, which according to Zhang (2007) belong to the highest covariance group. Zhang (2007) suggests that accruals reflect the information about firms' investment, which explains why accruals predict future stock returns. We further argue that the concentration of the accrual anomaly in manufacturing industries casts doubt on the earnings management hypothesis as the only contender to explain the accrual anomaly as it is difficult to argue that earnings management is more likely to exist in manufacturing industries than, for example, services industries. Along the line of Zhang's (2007) argument, accruals in

[3] One exception is industry group 7, i.e. personal services, which has the accrual profit of 0.43% per month and is weakly statistically significant with the p-value of 6%. Furthermore, the returns of the accrual quintiles considerably fluctuate rather than following a monotonic pattern. It is not evident for the accrual anomaly, i.e. the negative relationship between accruals and stock returns.

manufacturing firms reflect investment in working capital and are more likely to reflect the information about firms' investment than accruals in the other industries. Hence it is likely that the accrual anomaly is affected by (a) the nature of firms' investment and (b) the financial constraint status which could affect firms' investment activities.

[Table 3 about here]

The accrual effect across the business cycle

Caggese (2007) argues that during economic downturns, firms need to cut back their investment; and as fixed investment is more difficult to reverse, firms will cut back working capital more than it should, or the working capital level is inefficiently low. On the other hand, during economic upturns, firms hesitate to expand its fixed investment in anticipation of the difficulty in reversing the investment when the economic environment worsens. Caggese's (2007) argument suggests that the working capital level is inefficiently low in downturns and inefficiently high in upturns. The implication of this tendency on the relative performance of stocks with high and low accrual levels across the business cycle is as follows: during economic downturns, as the working capital level in general tends to be inefficiently low, firms with high working capital level are rewarded. By the same token, during economic upturns, as the working capital level in general tends to be inefficiently high, firms with low working capital level are rewarded. Therefore the return of the portfolio that goes long in low accrual stocks and goes short in high accrual stocks should be lower during economic downturns and higher during economic upturns.

In the last two columns of table 2, we examine the performance of the accrual strategy in upturns and downturns. Stocks are ranked into deciles based on the accrual ratio measured in December year t-1 and held in the respective portfolios from July year t to June year t+1. Based on the Chicago Fed National Activity Index, we classify 236 out of 420 months (January 1972 to December 2006) as upturns (with positive index values) , and 184 out of 420 months as downturns (with negative index values). Consistent with the expectation, the low – high portfolio generates higher returns in the upturns than in the downturns. During the upturns, the average return of the low – high portfolio is

0.67% per month and is statistically significant at 1% level. On the other hand, this portfolio generates on average 0.35% per month, or just above half of the average return during the upturns, with the statistical significance of 7%. Economically and statistically, the return of the low – high portfolio is weaker during the downturns and stronger during the upturns.

The implications from the mechanism in Caggese (2007) are silent with regard to the reason why this low-high portfolio generates positive and significant returns in the first place, but it suggests that the return pattern should follow the business cycle and that the accrual profit should be stronger during economic upturns and weaker during economic downturns. In the light of Lakonishok et al. (1994), Lettau and Ludvigson (2001), and Petkova and Zhang (2005), riskier stocks perform better in good state of the world and perform worse in bad state of the world than less risky stocks. The evidence in Table 2 suggests the necessary, though not the sufficient, condition that low accrual stocks might have higher risks than high accrual stocks.

On the other hand, the earnings management hypothesis, one of the explanations for the accrual anomaly in the literature, would predict the opposite. According to Chan, Chan, Jegadeesh and Lakonishok (2006), during the period when growth is low, management suffer more pressure to manipulate or manage earnings. If they manage earnings through increasing accruals, firms with high accruals will be associated with low subsequent stock returns. One could therefore expect that if earnings management underlies the accrual anomaly, then the accrual anomaly should be stronger during economic downturns and weaker during economic upturns. Our evidence that the accrual profit is higher during upturns and lower during downturns is against the prediction by the earnings management hypothesis.

In the previous session, our evidence that the accrual anomaly is only concentrated in manufacturing industries reported in panel A of table 3 also casts doubt on the role of the earnings management hypothesis. In panel B we further investigate the performance of the accrual strategy in upturns and downturns in each industry. The evidence shows that during upturns, the industries number 2 and 3 are again the only industries that have statistically and economically significant accrual profits. During downturns, the accrual profits in these industries are economically weaker and statistically mostly insignificant. The accrual profits during downturns in all industries are mostly economically weaker and statistically insignificant[4]. Not only does the accrual anomaly concentrate on the manufacturing industries but also its cyclicality. The evidence reinforces our arguments so far that (a) earnings management is not likely to be the sole driver of the accrual anomaly, (b) it is potentially linked to firms' investment activities, and consequently (c) the nature of firms' investment and their financial constraint status could be relevant to the accrual anomaly.

The cyclical accrual anomaly and investment and financing frictions

The cyclicality of the accrual anomaly in high vs. low investment irreversibility

Table 4 examines the return from the accrual investment strategy among firms with high and low investment irreversibility. The average returns of the accrual deciles in the subsample with low investment irreversibility vary within a wider range than those in the subsample with high investment irreversibility. As a result, the average return of the low - high portfolio in the low investment irreversibility subsample is higher than that in the high investment irreversibility subsample. The higher accrual return in the low investment irreversibility subsample is contributed by both higher returns of the low accrual decile and lower return of the high accrual decile. While the accrual return in both subsamples are statistically significant, the accrual return of 0.66% per month in the subsample with low investment irreversibility is more than double the accrual return of 0.31% per month in the subsample with high investment irreversibility. This result is against our expectation based on the mechanism in Caggese (2007) that the accrual anomaly is stronger among firms with high investment irreversibility.

[Table 4 about here]

[4] The only exception is industry group 7, which has more economically and statistically significant accrual profit during downturns than during upturns. However, similar to the return pattern of the accrual quintiles across the business cycle in panel A of table 3, the return pattern of the accrual quintiles of this industry group during downturns is not monotonic. Therefore although the accrual profit is positive and significant, it is not evident for the accrual anomaly, i.e. the negative relationship between accruals and stock returns.

The cyclicality of the accrual profit exhibits in both low and high investment irreversibility subsamples. In the high investment irreversibility subsample, the accrual profit during upturns is 0.48% per month at 1% significant level, whereas during downturns, it is is averaged at 0.36% per month at 7% statistical significance. Similarly among firms with low investment irreversibility, during upturns, the accrual profit is 0.72% per month at 1% statistical significance, while during downturns it declines to 0.40% per month and is statistically insignificant by conventional levels. The evidence suggests that similar to the overall sample, in both subsamples with different investment irreversibility levels, the accrual profit is cyclical, higher during upturns and lower during downturns.

The mechanism in Caggese (2007) suggests that firms with high investment irreversibility will find it more difficult to reverse its fixed investment during downturns, hence its working capital will be more inefficiently low than firms with low investment irreversibility. Therefore the accrual profit is expected to be more cyclical among firms with high investment irreversibility. However, Table 4 exhibits a pattern in contrast with our expectation about the cyclicality of the accrual return among firms with high vs. low investment irreversibility. Among the stocks with high investment irreversibility, from upturns to downturns the accrual profit declines by 0.12% per month or 25% of the average return during upturns. On the other hand, among the subsample with low investment irreversibility, the accrual profit drops by 0.32% per month or 45% of the average return during upturns. This result is driven by the higher accrual profit in the low investment irreversibility subsample than the high investment irreversibility subsample during upturns, similar to the behaviour of the accrual profit across the business cycle. Again, this result is against our expectation based on the mechanism in Caggese (2007) that the accrual anomaly is stronger among firms with high investment irreversibility.

[Table 5 about here]

In Table 5, we check the pattern of the accrual profit in high vs. low investment irreversibility in different industries. In panel A of table 5, similar to the result reported in panel A of table 3, the accrual profit concentrates in industry groups 2 and 3, i.e. manufacturing industries, in both high and low investment irreversibility subsamples. The puzzle in table 4, i.e. the accrual profit is higher among firms with low investment irreversibility than among firms with high investment irreversibility, is also present in these industry groups. In panel B of table 5, among firms with high investment irreversibility, the accrual profit also concentrates in the manufacturing industries and exhibits the cyclical behaviour, statistically and economically higher during upturns and lower during downturns. Similar pattern is observed in panel C of table 5 among firms with low investment irreversibility. The implication is that the accrual profit is highest among low investment irreversibility firms in the manufacturing industries during upturns. The evidence suggests that investment irreversibility is relevant to the magnitude and the cyclicality of the accrual profit, which is concentrated in the manufacturing industries; however the direction of the influence remains to be a puzzle.

The cyclicality of the accrual anomaly in high vs. low financial constraint

Table 6 examines the return from the accrual investment strategy among firms with high and low financial constraint status. The accrual profit among firms with high financial constraint is averaged at 0.62% per month and is highly statistically significant, whereas it is weakly statistically significant at only 0.27% per month among firms with low financial constraint. The evidence is consistent with our expectation that the accrual anomaly should be stronger among firms that are financially more constrained.

The cyclicality of the accrual profit exhibits in both low and high financial constraint subsamples. Among firms with high financial constraint, during upturns, the accrual profit is 0.74% per month at 1% statistical significance, whereas during downturn, it drops to 0.44% per month at 8% statistical significance. Among firms with low financial constraint, during upturns, the accrual profit is 0.39% per month at 1% statistical significance, while during downturns it is slightly lower at 0.30% per month and is statistically insignificant by conventional levels. The evidence suggests that similar to the overall sample, in both subsamples with different financial constraint levels, the accrual profit is cyclical, higher during upturns and lower during downturns.

[Table 6 about here]

Furthermore, the subsample with high financial constraint witnesses a stronger drop in the accrual profit from upturns to downturns, by 0.30% per month or 40% of the average return during upturns. On the other hand, among the subsample with low financial constraint, the accrual profit declines by only 0.09% per month, or over 20% of the average return during upturns. The evidence is consistent with our expectation that the cyclicality of the accrual profit is stronger among firms with high financial constraint and weaker among firms with low financial constraint. As the return of the high accrual decile drives the accrual profit, the implication of the mechanism in Caggese (2007) to the accrual anomaly is suggested as follows: during upturns, the working capital is inefficiently high, therefore high accrual stocks are punished, hence the return of the low – high accrual portfolio is higher; on the other hand, during downturns, the working capital is inefficiently low, therefore high accrual stocks are rewarded, hence the return of the low – high accrual portfolio is lower. As during downturns firms with high financial constraint have to cut back more fixed investment and working capital than firms with low financial constraint do, this cyclical behaviour is stronger among firms with high financial constraint than among firms with low financial constraint.

[Table 7 about here]

In Table 7, we check the pattern of the accrual profit in high vs. low financial constraint in different industries. In panel A of table 7, similar to the result reported in panel A of table 3, the accrual profit concentrates in industry groups 2 and 3, i.e. manufacturing industries, in both high and low financial constraint subsamples. The pattern in table 5, i.e. the accrual profit is higher among firms with high financial constraint than among firms with low financial constraint, is also present in these industry groups. In panel B of table 7, among firms with high financial constraint, the accrual profit also concentrates in the manufacturing industries and exhibits the cyclical behaviour, statistically and economically higher during upturns and lower during downturns. Similar pattern is observed in panel C of table 7 among firms with low investment irreversibility. The implication is that the accrual profit is highest among highly financially constrained firms in the manufacturing industries during upturns. The evidence suggests that financial constraint is relevant to the magnitude and the cyclicality of the accrual profit, which is concentrated in the manufacturing industries, in the direction that is consistent with our expectation.

The cyclicality of the accrual anomaly in different financial constraint and investment irreversibility levels

Table 8 examines the cyclicality of the return from the accrual investment strategy among firms with different level of financial constraint and investment irreversibility. Consistent with the evidence so far, the accrual profit is always higher during upturns than during downturns in all four subsamples by investment irreversibility and financial constraint status. In fact, the accrual profit is insignificant during downturns in all of the four subsamples. Of the average accrual profits during upturns in these subsamples, the accrual profit in the subsample with high investment irreversibility and high financial constraint is most economically and statistically significant at 0.81% per month with 1% statistical significance. At the other end of the spectrum is the accrual profit when investment irreversibility is high and financial constraint is low, when the accrual profit is least economically significant and statistically insignificant. In between the extremes are the accrual profits among firms with low investment irreversibility when the financial constraint is either binding or non-binding.

Driven by the accrual profit during upturns, the cyclicality of the accrual profit also follows the same pattern, i.e. the difference between the accrual profit during upturns and downturns is highest among firms with high investment irreversibility and high financial constraint and lowest among firms with high investment irreversibility and low financial constraint. The cyclicality of the accrual profit among firms with low investment irreversibility, regardless of the financial constraint status, falls in between the cyclicality of the accrual profits in the samples of firms with high investment irreversibility.

[Table 8 about here]

The behaviour of the accrual profit in the four subsamples can explain for the behaviour of the accrual profit in the high vs. low investment irreversibility that was at odd with our expectation. The subsamples of firms with high investment irreversibility generate the highest and lowest accrual profit in terms of both statistical and economic significance depending on the financial constraint status. In aggregate, the significance of the accrual profit of firms with high investment irreversibility and high financial constraint is neutralised by the insignificance of the accrual profit of firms with high investment irreversibility but low financial constraint. On the other hand, when firms have flexibility in investment, i.e. low investment irreversibility, the financial constraint status does not considerably change the accrual profit – it remains statistically and economically significant. This explains why when we partition firms with high vs. low investment irreversibility, the latter subsample exhibits more significant accrual profit and accrual profit cyclicality than the former subsample.

The evidence suggests that in accordance with the implication from the mechanism by Caggese (2007), financial inflexibility reinforces the impact of investment irreversibility on firms. This relationship leads to the cyclicality of the accrual profit, i.e. the higher performance of the accrual strategy during upturns as compared to its performance during downturns. It also leads to the strongest accrual profit among firms that are subject to both financing and investment inflexibility. However, financial inflexibility does not have a significant impact on the accrual profit among firms with high investment flexibility. Together with the evidence that all the behaviours observed in the pooled sample are concentrated in the manufacturing industries in which the nature of investment and financing activities are most relevant, the interaction between financing and investment inflexibility on the accrual profit suggests that the accrual anomaly is related to the fundamental information at firm level, which is influenced by the cycle in the macroeconomic environment. If the accrual is related to the fundamental information, one could expect that the accrual anomaly can be priced by an appropriate asset pricing model. We investigate this prospect in the following session.

The accrual effect in conditional asset pricing model

The analysis in this paper so far does not take into account any differences in risks between stocks with low and high accrual. This section investigates whether the accrual anomaly can be explained by risks. We use the framework in Avramov and Chordia (2006), which involves Fama and MacBeth two-stage procedure. In stage one, stock returns of individual firms are adjusted for risks using an asset pricing model. In stage two, the risk adjusted returns are regressed against the variables that proxy for the widely documented asset pricing anomalies. An asset pricing anomaly is captured when the coefficient attached to it is not significantly different from zero. Lower adjusted R-square is the signal for the improving explanatory power of the model overall. The framework in Avramov and Chordia (2006) uses 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. Another advantage of the framework is that it can flexibly incorporate additional information into the main asset pricing model used to adjust stock returns for risks.

Avramov and Chordia (2006) is the first study to use both firm level variables, i.e. BM and size, and the business cycle factor to condition betas of the multi factor models. Antoniou et al. (2007) use Avramov and Chordia (2006) framework but include analyst forecast variables in the second stage to test the impact of these variables on the momentum effect and find that these behavioral variables are not relevant to the momentum effect. Bauer et al. (2008) use this framework to price 25 size-BM portfolios and report that it fails to capture the momentum effect in the European market. Ho and Hung (2009) condition the Fama and French factors additionally on various investment sentiment indicators and find that the conditional models often but not always capture the momentum effect.

The model specification is described below. In stage one, the following time series regression is run for individual firms:

$$R_{jt} - R_{Ft} = \alpha_j + \sum_{f=1}^{F} \begin{bmatrix} \beta_{j,1} & \beta_{j,2} & \beta_{j,3} & \beta_{j,4} \end{bmatrix} \times \begin{bmatrix} 1 \\ Firm_{j,t-1} \\ MWF_{t-1} \\ Firm_{j,t-1} \times MWF_{t-1} \end{bmatrix} \times F_{ft} + e_{jt} \quad (1)$$

in which R_{jt} is the return on stock j at time t; MWF_{t-1} is one month lagged market wide factor default spread, which is used to proxy for business cycle variable. F_{ft} represents priced risk factors. $Firm_{j,t-1}$ represents the firm level characteristics that affect the cross section of stock returns.

In stage two, i.e. the cross sectional regressions, the risk adjusted returns obtained from stage one are then regressed on lagged returns to assess the explanatory power of the asset pricing model in stage one to the accrual effect

$$R^*_{jt} = c_{0t} + c_{ACC,t} \times ACC_{jt-1} + \begin{bmatrix} c_{1t} & c_{2t} & c_{3t} & c_{4t} \end{bmatrix} \times \begin{bmatrix} Size_{jt-1} \\ BM_{jt-1} \\ PR_{jt-1} \\ Turnover_{jt-1} \end{bmatrix} + u_{jt} \qquad (2)$$

in which 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 (1). $ACC_{j,t-1}$ represents the accrual ratio of firm j in December of the previous year. The vector of size, book-to-market ratio, past return $PR_{j,t-1}$ and stock turnover in equation (2) represent the control factors for other well documented asset pricing anomalies (size, value, momentum, and liquidity respectively). For detailed construction of the variables, refer to Appendix.

The null hypothesis is that the coefficient $c_{ACC,t}$ attached to the accrual variable is not significantly different from zero, meaning that the accrual effect is captured when returns are adjusted for risks in stage one. Fama and MacBeth coefficients and t-statistics are reported. The t-statistics are corrected for autocorrelation and heteroskedasticity using the Newey and West (1987) procedure.

[Table 9 about here]

In Table 9 we apply the framework of Avramov and Chordia (2006) as follows. In panel A, we do not adjust the return for risk, therefore we run the cross sectional OLS regression in equation (2) using raw returns in replacement of risk adjusted return R^*_{jt}. In panel B, we test whether the widely used multi factor model of Fama and French[5], both in the original form and in the conditional forms, is capable of capturing the accrual anomaly. First, the unconditional Fama and French model is used to

[5] We perform the same analysis for other factor models including the CAPM, the Carhart (1997) model with the momentum factor in addition to Fama and French's three factor model, and the Carhart model augmented with Pastor and Stambaugh liquidity factor. The results are very similar qualitatively. These results are available upon request.

adjust for risks in individual firms' stock returns. The model in equation (2) is first fully restricted, i.e. $\beta_{j,2} = \beta_{j,3} = \beta_{j,4} = 0$ in panel B.1.

Given the evidence of the cyclicality of the accrual profit discussed in this paper, in panel B.2 we test whether supplementing the information about the business cycle can help improve the ability of Fama and French model in capturing the accrual anomaly by conditioning betas on the business cycle information. We impose the restriction $\beta_{j,2} = \beta_{j,4} = 0$ in equation (2).

In panels B.3, B.4 and B.5, in addition to the information about the business cycle, we supplement the conditional Fama and French model in stage one with information about firms characteristics. Given the relevance of the financial constraint status and the investment irreversibility evidenced in Table 4 to 8, we supplement firm level financial constraint status in panel B.3, investment irreversibility in panel B.4, and both of them in panel B.5. As both firm characteristics and business cycle information are used to condition betas, no restriction is imposed in equation (2).

Finally, given the strong cyclicality of the accrual profit, we use a business cycle model to adjust for risks in panel C. In the light of the literature, we use four business cycle variables, i.e. Treasury bill rate, default spread, term spread, and dividend yield. The raw returns of individual stocks are adjusted for risks in the following OLS time series regression:

$$R_{jt} = \alpha_j + \begin{bmatrix} \gamma_{j,1} & \gamma_{j,2} & \gamma_{j,3} & \gamma_{j,4} \end{bmatrix} \times \begin{bmatrix} R_t^{30} \\ Def_t \\ Term_t \\ Dy_t \end{bmatrix} + e_{jt} \tag{3}$$

in which R_t^{30} is the 30 day T bill rate in % at time t, Def_t is the default spread in % between the returns of US corporate bonds rated BAA and AAA, at time t. $Term_t$ is the term spread in % between the returns of 10 year Treasury bonds and 1 year Treasury bonds. Dy_t is the dividend yield of the stocks listed in NYSE, AMEX, and NASDAQ, calculated as $100 \times e^{ldy}$ where ldy is the naturla log of the imputed dividend yield taken from Jacob Boudoukh's data for the paper Boudoukh et al. (2007). In Boudoukh's data, dly is the natural log of the imputed dividend yield calculated from value weighted returns, including and excluding distributions, for NYSE, AMEX, NASDAQ, taken from CRSP.

The risk adjusted return of stock j at time t is measured as the sum of the constant and the residual terms from equation (2) and is used as the dependent variable in the cross sectional OLS regression (2) to test whether the accrual anomaly exists after the returns are adjusted for the business cycle risk factors.

In panel A of Table 9, when individual stock returns are not adjusted for risks, the coefficient attached to the accrual variable in equation (2) is negative at 1% significant level. This evidence suggests the existence of the accrual anomaly, i.e. the higher the accrual ratio, the lower the stock returns, even when other well documented asset pricing anomalies (size, value, momentum, and liquidity) are controlled for. In panel B.1, the unconditional Fama and French three factor model is used to adjust stock returns for risks. As the accrual coefficient is negative and statistically significant and the magnitude of the coefficient is smaller than that in panel A, the evidence suggest that the unconditional model fails to capture the accrual anomaly but the accrual anomaly is weaker when this model is used to adjust for risks.

In panel B.2, the betas in the three factor model are conditioned on the default spread, which proxies for the information about the business cycle. The coefficient attached to the accrual variable in equation (2) is negative and statistically significant. Even though the accrual profit exhibits the cyclical behaviour, supplementing information about the business cycle to the three factor model is inefficient to help this model to capture the accrual effect. In panels B.3, B.4 and B.5, information about firms' financial constraint and investment irreversibility is supplemented to the conditional version of the three factor model in panel B.2. The coefficients attached to the accrual variable in equation (2) in three panels are all negative and statistically significant. Although the analysis of the accrual portfolios suggests that the existence of the accrual anomaly depends on the firm level of financial constraint and investment irreversibility, including the information about these variables on top of the information about the business cycle in the three factor model is insufficient to help the model to capture the accrual effect.

Finally, in panel C, when individual stock returns are adjusted for risks using the business cycle model in equation (3), the coefficient attached to the accrual variable in equation (2) is insignificant with the p value of over 60%, whereas the corresponding coefficient in the other panels are all statistically significant. Moreover, the economic significance of the coefficient in panel C is also lower than that of the corresponding coefficients in the other panels. Its magnitude is approximately 35% the magnitude of the coefficient in panel A where the returns are not adjusted for risks; and 40% to 50% the magnitude of the coefficients in panel B where the returns are adjusted for risks using different versions of the three factor model. The adjusted R-square is 6.5%, higher than the adjusted R-square of 3.0% to 3.4% in panel B when different versions of the three factor model are used to adjust for risks, but slightly lower than the adjusted R-square of 6.8% in panel A when returns are not adjusted for risks. The evidence suggests that the three factor model is better in capturing the other anomalies that are controlled for in equation (2), but it is unable to capture the accrual anomaly; while the business cycle model is capable of capturing it. This is consistent with other findings in this paper that the accrual profit is cyclical and is driven by the business cycle.

Conclusion

The paper presents the evidence of the existence of the accrual anomaly, i.e. the stocks with low accrual ratio as measured in Sloan (1996) earns higher returns that the stocks with high accrual ratio, a result consistent with the literature. The accrual profit is higher during upturns than during downturns, a result that is robust in the pooled sample and in all subsamples by investment irreversibility, financial constraint, or both. The evidence suggests the necessary, though not the sufficient condition, that low accrual stocks have higher risks than high accrual stocks. The evidence is also against the prediction by the earnings management explanation that the accrual anomaly should be stronger during downturns and weaker during upturns as management are under greater pressure during downturns to manage firms' earnings.

We find the evidence that the accrual anomaly is more cyclical among firms with low investment irreversibility than among firms with high investment irreversibility. This appears to be in contrast with the prediction in light of the mechanism by Caggese (2007) that firms with high investment irreversibility will find it more difficult to reverse its fixed investment during downturns, hence its working capital will be more inefficiently low than firms with low investment irreversibility, and the accrual profit is expected to be more cyclical among the former than the latter firms.

Next we find the evidence that the accrual anomaly is more cyclical among firms with high financial constraint than among firms with low financial constraint. This evidence is supportive of the prediction in light of the mechanism by Caggese (2007) that during upturns, the working capital is inefficiently high, therefore high accrual stocks are punished, hence the return of the low – high accrual portfolio is higher; on the other hand, during downturns, the working capital is inefficiently low, therefore high accrual stocks are rewarded, hence the return of the low – high accrual portfolio is lower. As during downturns firms with high financial constraint have to cut back more fixed investment and working capital than firms with low financial constraint do, this cyclical behaviour is stronger among firms with high financial constraint than among firms with low financial constraint.

We further investigate the combined influence of investment irreversibility and financial constraint to the cyclicality of the accrual profit and find that the behaviour of the accrual profit in the four subsamples by investment irreversibility and financial constraint can explain for the behaviour of the accrual profit in the high vs. low investment irreversibility that was at odd with our expectation. The subsamples of firms with high investment irreversibility generate the highest and lowest accrual profit in terms of both statistical and economic significance depending on the financial constraint status. In aggregate, the significance of the accrual profit of firms with high investment irreversibility and high financial constraint is neutralised by the insignificance of the accrual profit of firms with high investment irreversibility but low financial constraint. On the other hand, when firms have flexibility in investment, i.e. low investment irreversibility, the financial constraint status does not considerably affect the accrual profit – it remains statistically and economically significant with the same magnitude.

The evidence suggests that in accordance with the implication from the mechanism by Caggese (2007), financial inflexibility reinforces the impact of investment irreversibility on firms.

This relationship leads to the cyclicality of the accrual profit, i.e. the higher performance of the accrual strategy during upturns as compared to its performance during downturns. It also leads to the strongest accrual profit among firms that are subject to both financing and investment inflexibility. However, financial inflexibility does not have a significant impact on the accrual profit among firms with high investment flexibility. Together with the evidence that all the behaviours observed in the pooled sample are concentrated in the manufacturing industries in which the nature of investment and financing activities are most relevant, the interaction between financing and investment inflexibility on the accrual profit suggests that the accrual anomaly is related to the fundamental information at firm level, which is influenced by the cycle in the macroeconomic environment. If the accrual is related to the fundamental information, one could expect that the accrual anomaly can be priced by an appropriate asset pricing model.

We find that the CAPM and the related multifactor models, including Fama and French three factor model[6], whether in the form of unconditional or conditional on the business cycle, investment irreversibility and financial constraint, are incapable of capturing the accrual anomaly at firm level when controlling for the well documented anomalies, i.e. value, size, momentum and liquidity effects. On the other hand, the business cycle model consisting of Treasury bill rate, default spread, term spread and dividend yield is capable of capturing completely the accrual anomaly at firm level when the other effects are controlled for. This evidence is consistent with our other findings that the accrual profit is driven by the fundamental activities at firm level, which in turn is affected by the business cycle.

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Appendix: Key variables construction

Variable	Construction method
Accrual	We follow Sloan (1996) and measure accrual at December each year as follows: ACC = (Change in non-cash current assets – Change in current liabilities excluding changes in short term debts and tax payable – Depreciation) / average total assets
Investment irreversibility	To proxy for investment irreversibility, we choose depreciation rate among the three dimensions of investment irreversibility by Keesides (1990) and Farinas and Ruano (2005). Depreciation rate is measured at December each year as follows: Depreciation rate = Depreciation expense / beginning of the year net fixed assets
Financial constraint	Following Almeida and Campello (2007) and Hahn and Lee (2009), we proxy for financial constraint using net payout ratio, measured at December each year as follows: Net payout ratio = (Dividends of common stocks + Dividends of preferred stocks + Repurchases – Issuance) / Net income
Variables in Avramov and Chordia's (2006) framework	We follow Avramov and Chordia (2006) and Brennan et al. (1998) and measure the variables in the second stage of Avramov and Chodia's framework as follows:
SIZE	1. Calculate the market value in billion \$ at the end of the 2nd month before the current month; 2. Take natural log transformation; 3. Take the deviation from the cross sectional mean at each month.
BM	1. Calculate the BM ratio as at December the previous year; 2. Take natural log transformation; 3. Take the deviation from the cross sectional mean at each month.
Turnover	1. Calculate the turnover as trading volume / total shares outstanding for the 2nd month before the current month; 2. Take natural log transformation; 3. Take the deviation from the cross sectional mean at each month; 4. The variable Turnover of NYSE and AMEX has the value of zero if the stock is listed in NASDAQ. Similarly, the variable Turnover of NASDAQ has the value of zero if the stock is listed in NYSE or AMEX.
RET23, RET46, RET712	1. Calculate the cumulative return from the 2nd to the 3rd month, the 4th to the 6th month, and the 7th to the 12th month before the current month; 2. Take the deviation from the cross sectional mean at each month. Following Brennan et al. (1998), we lag all the transformed variables by one more month as they all involve the price level to avoid biases in estimates caused by bid-ask spread and thin trading.

Table 1: Descriptive statistics for key variables

This table presents some descriptive statistics for the key variables of accrual, depreciation charge and net payout ratio of the sample of non financial, non utilities firms listed in the three main exchanges in the US market. Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers 420 months from January 1976 to December 2006. Only stocks with available information to construct the accrual ratio are included. Details on how the key variables are constructed are presented in the Appendix.

%	**Mean**	**Median**	**Standard deviation**
Accrual	-2.23	-2.94	8.39
Depreciation charge	36.97	15.85	639.05
Net payout ratio	3.35	18.02	1,124.32

Correlation panel:

	Accrual	**Depreciation charge**	**Net payout ratio**
Accrual	1	-0.00029	-0.02657
Depreciation charge	-0.00029	1	-0.0005
Net payout ratio	-0.02657	-0.0005	1

Table 2: The returns of accrual ranked decile portfolios

This table presents the returns of the accrual decile portfolios and of the accrual strategy across the business cycle and in different stages. Stocks are non financial, non utilities firms listed in the three main exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers the period from January 1976 to December 2006. Only those stocks with available information to construct the accrual ratio are included.

Following Sloan (1996), we rank stocks into deciles based on the accrual ratio measured in December year t-1 and held from July year t to June year t+1. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. We assign positive index to upturn (236 out of 420 months) and negative index to downturn (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. Low – High represents the returns of the portfolios that go long in stocks with low accrual and go short in stocks with high accrual. T-statistics and the corresponding p values are presented. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

	All	Upturn	Downturn
Low - Return (%)	**1.56**	**1.20**	**2.03**
t-value	5.07	3.25	3.90
p-value	0%	0%	0%
2 - Return (%)	**1.51**	**1.21**	**1.88**
t-value	5.61	3.62	4.31
p-value	0%	0%	0%
3 - Return (%)	**1.47**	**1.13**	**1.91**
t-value	5.64	3.51	4.46
p-value	0%	0%	0%
4 - Return (%)	**1.45**	**1.15**	**1.84**
t-value	5.66	3.56	4.46
p-value	0%	0%	0%
5 - Return (%)	**1.38**	**1.01**	**1.84**
t-value	5.29	3.15	4.32
p-value	0%	0%	0%
6 - Return (%)	**1.45**	**1.11**	**1.89**
t-value	5.47	3.37	4.37
p-value	0%	0%	0%
7 - Return (%)	**1.33**	**1.01**	**1.75**
t-value	5.01	2.98	4.13
p-value	0%	0%	0%
8 - Return (%)	**1.28**	**0.94**	**1.72**
t-value	4.63	2.71	3.85
p-value	0%	0%	0%
9 - Return (%)	**1.26**	**0.84**	**1.80**
t-value	4.14	2.22	3.62
p-value	0%	3%	0%
High - Return (%)	**1.03**	**0.53**	**1.67**
t-value	2.90	1.22	2.85
p-value	0%	22%	0%
(Low – High) - Return (%)	**0.53**	**0.67**	**0.35**
t-value	4.25	4.08	1.85
p-value	0%	0%	7%
	***	***	*

Table 3: The accrual anomaly in different industries

This table presents the returns of the 5 accrual quintile portfolios and the returns of the accrual strategy in each industry group. Stocks are non financial, non utilities firms listed in the three main tock exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers 420 months from January 1976 to December 2006. Only stocks with available information to construct the accrual ratio are included. Stocks are classified into different industry groups using the first digit of the industry code (data324) in Compustat.

Within each industry group, following Sloan (1996), we rank stocks into quintiles based on the accrual ratio measured in December year t-1 and held in the respective portfolios from July year t to June year t+1. Panel A presents the returns of the quintiles and the portfolios that go long in low accrual and go short in high accrual stocks in each industry group. Panel B presents the returns of these portfolios in upturn and downturn. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators with the mean of zero and the standard deviation of one. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below trend. We assign positive index to upturns (236 out of 420 months) and negative index to downturns (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. T-statistics and the corresponding p values are presented. *, **, and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

Panel A: The accrual profit in different industries across the business cycle

Industries	0	1	2	3	4	5	7	8	9
Low - No of months	290	420	420	420	420	420	420	420	0
Return (%)	**1.04**	**1.49**	**1.55**	**1.64**	**1.25**	**1.48**	**1.83**	**1.72**	
t-value	1.68	3.69	5.93	5.15	3.68	4.97	4.54	4.37	
p-value	9%	0%	0%	0%	0%	0%	0%	0%	
2 - No of months	378	420	420	420	420	420	420	420	28
Return (%)	**1.44**	**1.48**	**1.39**	**1.37**	**1.33**	**1.38**	**1.58**	**1.65**	**-1.01**
t-value	2.68	3.85	6.11	4.62	4.44	4.91	4.10	4.38	-0.58
p-value	1%	0%	0%	0%	0%	0%	0%	0%	56%
3 - No of months	356	420	420	420	420	420	420	415	42
Return (%)	**0.42**	**1.61**	**1.40**	**1.40**	**1.36**	**1.45**	**1.44**	**1.58**	**2.77**
t-value	0.95	4.21	6.00	4.78	4.96	5.19	4.04	3.84	2.39
p-value	34%	0%	0%	0%	0%	0%	0%	0%	2%
4 - No of months	378	420	420	420	420	420	420	420	36
Return (%)	**1.31**	**1.54**	**1.20**	**1.22**	**1.41**	**1.27**	**1.65**	**1.18**	**1.95**
t-value	2.75	4.29	4.86	4.03	5.09	4.32	4.16	3.17	1.43
p-value	1%	0%	0%	0%	0%	0%	0%	0%	16%
High - No of months	420	420	420	420	420	420	420	419	145
Return (%)	**1.28**	**1.34**	**1.23**	**1.11**	**1.44**	**1.28**	**1.40**	**1.43**	**1.54**
t-value	3.76	3.55	4.51	3.04	4.76	3.76	3.34	2.95	1.16
p-value	0%	0%	0%	0%	0%	0%	0%	0%	25%
(Low – High)- No of months	290	420	420	420	420	420	420	419	0
Return (%)	**-0.30**	**0.15**	**0.32**	**0.52**	**-0.19**	**0.20**	**0.43**	**0.34**	
t-value	-0.42	0.57	2.78	4.27	-0.90	1.13	1.86	0.80	
p-value	68%	57%	1%	0%	37%	26%	6%	43%	
			***	***			*		

Panel B: The accrual profit in different industries during economic upturns and downturns

	Upturn									Downturn								
Industries	0	1	2	3	4	5	7	8	9	0	1	2	3	4	5	7	8	9
Low																		
No of months	156	236	236	236	236	236	236	236	0	134	184	184	184	184	184	184	184	0
Return (%)	**0.88**	**1.17**	**1.30**	**1.38**	**0.93**	**0.98**	**0.92**	**1.03**		**1.22**	**1.90**	**1.88**	**1.97**	**1.66**	**2.13**	**3.00**	**2.60**	
t-value	0.99	2.35	4.20	3.49	2.31	2.75	1.87	2.14		1.42	2.86	4.21	3.79	2.87	4.23	4.52	4.01	
p-value	32%	2%	0%	0%	2%	1%	6%	3%		16%	0%	0%	0%	0%	0%	0%	0%	
2																		
No of months	207	236	236	236	236	236	236	236	3	171	184	184	184	184	184	184	184	25
Return (%)	**1.22**	**1.05**	**1.08**	**1.14**	**0.89**	**0.80**	**1.17**	**1.15**	**-6.58**	**1.72**	**2.03**	**1.80**	**1.66**	**1.89**	**2.13**	**2.11**	**2.30**	**-0.35**
t-value	1.78	2.20	3.77	3.10	2.47	2.22	2.40	2.45	-1.47	2.00	3.23	4.88	3.43	3.77	4.82	3.41	3.73	-0.19
p-value	8%	3%	0%	0%	1%	3%	2%	2%	28%	5%	0%	0%	0%	0%	0%	0%	0%	85%
3																		
No of months	201	236	236	236	236	236	236	236	20	155	184	184	184	184	184	184	179	22
Return (%)	**0.27**	**1.21**	**0.99**	**1.14**	**1.16**	**0.92**	**1.17**	**0.91**	**2.75**	**0.62**	**2.11**	**1.93**	**1.73**	**1.62**	**2.11**	**1.78**	**2.47**	**2.78**
t-value	0.47	2.69	3.42	3.13	3.51	2.59	2.46	1.75	1.44	0.88	3.25	5.08	3.62	3.51	4.83	3.32	3.73	1.95
p-value	64%	1%	0%	0%	0%	1%	1%	8%	17%	38%	0%	0%	0%	0%	0%	0%	0%	6%
4																		
No of months	207	236	236	236	236	236	236	236	3	171	184	184	184	184	184	184	184	33
Return (%)	**1.51**	**1.18**	**0.83**	**0.95**	**1.19**	**0.66**	**1.24**	**0.68**	**-1.88**	**1.06**	**2.00**	**1.68**	**1.56**	**1.68**	**2.05**	**2.18**	**1.83**	**2.30**
t-value	2.74	2.83	2.72	2.50	3.62	1.74	2.46	1.39	-0.49	1.30	3.22	4.14	3.19	3.58	4.48	3.45	3.18	1.58
p-value	1%	1%	1%	1%	0%	8%	1%	17%	68%	19%	0%	0%	0%	0%	0%	0%	0%	12%
High																		
No of months	230	236	236	236	236	236	236	236	74	184	184	184	184	184	184	184	183	71
Return (%)	**0.57**	**0.62**	**0.70**	**0.70**	**1.18**	**0.78**	**0.76**	**0.66**	**0.67**	**1.84**	**2.26**	**1.91**	**1.64**	**1.78**	**1.93**	**2.23**	**2.43**	**2.46**
t-value	1.03	1.40	2.07	1.59	3.29	1.81	1.44	1.23	0.35	3.09	3.53	4.33	2.68	3.44	3.53	3.30	2.80	1.32
p-value	30%	16%	4%	11%	0%	7%	15%	22%	73%	0%	0%	0%	1%	0%	0%	0%	1%	19%
Low - High																		
No of months	156	236	236	236	236	236	236	236	0	134	184	184	184	184	184	184	183	0
Return (%)	**0.18**	**0.54**	**0.59**	**0.68**	**-0.24**	**0.20**	**0.16**	**0.37**		**-0.85**	**-0.35**	**-0.03**	**0.33**	**-0.12**	**0.19**	**0.77**	**0.31**	**0.00**
t-value	0.17	1.55	4.15	4.44	-0.93	0.88	0.58	0.92		-0.88	-0.87	-0.13	1.64	-0.35	0.72	2.04	0.37	0.00
p-value	86%	12%	0%	0%	35%	38%	57%	36%		38%	38%	89%	10%	73%	47%	4%	71%	0%
			***	***									*			**		

Table 4: The accrual anomaly among high vs. low investment irreversibility firms

This table presents the returns of the accrual decile portfolios and of the accrual strategy across the business cycle and in different stages in high vs. low investment irreversibility subsamples. Stocks are non financial, non utilities firms listed in the three main exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers the period from January 1976 to December 2006. Only those stocks with available information to construct the accrual ratio are included. The original sample is partitioned using the depreciation charge rate into the top 50% (low investment irreversibility) and bottom 50% (high investment irreversibility). For detailed construction of the depreciation charge, refer to the Appendix.

Following Sloan (1996), we rank stocks into deciles based on the accrual ratio measured in December year t-1 and held from July year t to June year t+1. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. We assign positive index to upturn (236 out of 420 months) and negative index to downturn (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. Low – High represents the returns of the portfolios that go long in stocks with low accrual and go short in stocks with high accrual. T-statistics and the corresponding p values are presented. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

	High investment irreversibility			Low Investment Irreversibility		
	All	Upturn	Downturn	All	Upturn	Downturn
Low - Return (%)	**1.44**	**1.13**	**2.02**	**1.71**	**1.22**	**2.09**
t-value	5.24	3.31	4.44	4.58	3.01	3.59
p-value	0%	0%	0%	0%	0%	0%
2 - Return (%)	**1.42**	**1.19**	**1.77**	**1.59**	**1.31**	**1.97**
t-value	5.80	3.80	4.53	4.55	3.42	3.70
p-value	0%	0%	0%	0%	0%	0%
3 - Return (%)	**1.43**	**1.11**	**1.81**	**1.63**	**1.28**	**2.03**
t-value	5.55	3.57	4.34	4.91	3.45	4.12
p-value	0%	0%	0%	0%	0%	0%
4 - Return (%)	**1.34**	**0.98**	**1.70**	**1.44**	**1.18**	**1.90**
t-value	5.31	3.20	4.36	4.34	3.25	3.77
p-value	0%	0%	0%	0%	0%	0%
5 - Return (%)	**1.32**	**1.06**	**1.86**	**1.51**	**1.05**	**1.88**
t-value	5.33	3.38	4.58	4.42	2.85	3.85
p-value	0%	0%	0%	0%	0%	0%
6 - Return (%)	**1.44**	**1.09**	**1.86**	**1.49**	**1.17**	**1.96**
t-value	5.59	3.56	4.61	4.34	3.07	3.99
p-value	0%	0%	0%	0%	0%	0%
7 - Return (%)	**1.37**	**0.89**	**1.84**	**1.35**	**1.06**	**1.62**
t-value	5.24	2.90	4.55	3.86	2.67	3.14
p-value	0%	0%	0%	0%	1%	0%
8 - Return (%)	**1.19**	**0.84**	**1.60**	**1.17**	**0.79**	**1.71**
t-value	4.73	2.70	4.06	3.25	1.94	3.31
p-value	0%	1%	0%	0%	5%	0%
9 - Return (%)	**1.30**	**0.92**	**1.86**	**1.14**	**0.82**	**1.83**
t-value	4.97	2.78	4.31	3.09	1.96	3.19
p-value	0%	1%	0%	0%	5%	0%
High - Return (%)	**1.14**	**0.65**	**1.67**	**1.05**	**0.50**	**0.40**
t-value	3.74	1.71	3.39	2.47	1.03	1.57
p-value	0%	9%	0%	1%	30%	12%
(Low – High) Return (%)	**0.31**	**0.48**	**0.36**	**0.66**	**0.72**	**0.40**
t-value	2.03	2.79	1.82	3.37	3.36	1.57
p-value	4%	1%	7%	0%	0%	12%
	**	***	*	***	***	

Table 5: The accrual anomaly in the presence of investment irreversibility in different industries

This table presents the returns of the accrual quintile portfolios and of the accrual strategy across the business cycle and in different stages in high vs. low investment irreversibility subsamples. Stocks are non financial, non utilities firms listed in the three main exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers the period from January 1976 to December 2006. Only those stocks with available information to construct the accrual ratio are included. The original sample is partitioned using the depreciation charge rate into the top 50% (low investment irreversibility) and bottom 50% (high investment irreversibility). For detailed construction of the depreciation charge, refer to the Appendix.

Stocks are classified into different industry groups using the first digit of the industry code (data324) in Compustat. Within each industry group,following Sloan (1996), we rank stocks into quintiles based on the accrual ratio measured in December year t-1 and held from July year t to June year t+1. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. We assign positive index to upturn (236 out of 420 months) and negative index to downturn (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. Low – High represents the returns of the portfolios that go long in stocks with low accrual and go short in stocks with high accrual. T-statistics and the corresponding p values are presented. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

Panel A: High vs. low investment irreversibility

	High IIR									Low IIR								
Industries	0	1	2	3	4	5	7	8	9	0	1	2	3	4	5	7	8	9
Low																		
No of months	210	420	420	420	420	420	420	390	0	0	420	420	420	420	420	420	396	0
Return (%)	**1.73**	**1.63**	**1.49**	**1.56**	**1.33**	**1.43**	**1.94**	**1.52**			**1.53**	**1.69**	**1.70**	**1.12**	**1.65**	**1.85**	**1.30**	
t-value	2.18	4.09	6.20	5.24	3.84	4.61	4.31	3.26			3.08	4.98	4.82	2.47	4.93	4.41	2.83	
p-value	3%	0%	0%	0%	0%	0%	0%	0%			0%	0%	0%	1%	0%	0%	1%	
2																		
No of months	350	420	420	420	420	420	420	420	28	7	420	420	420	420	420	420	420	0
Return (%)	**1.29**	**1.74**	**1.32**	**1.30**	**1.14**	**1.30**	**1.24**	**1.99**	**-1.01**	**6.30**	**1.03**	**1.51**	**1.48**	**1.57**	**1.36**	**1.61**	**1.41**	
t-value	2.33	4.18	5.75	4.63	4.30	4.79	3.04	4.46	-0.58	1.25	2.57	5.27	4.51	4.07	4.01	3.83	3.12	
p-value	2%	0%	0%	0%	0%	0%	0%	0%	56%	26%	1%	0%	0%	0%	0%	0%	0%	
3																		
No of months	342	420	420	420	420	420	420	414	42	61	420	420	420	420	420	420	420	0
Return (%)	**0.96**	**1.46**	**1.39**	**1.32**	**1.36**	**1.50**	**1.47**	**1.59**	**2.77**	**-0.46**	**1.44**	**1.39**	**1.45**	**1.57**	**1.60**	**1.46**	**1.42**	
t-value	2.00	3.68	6.08	4.67	4.92	5.36	3.64	3.56	2.39	-0.27	3.41	4.88	4.28	4.10	4.93	3.83	3.33	
p-value	5%	0%	0%	0%	0%	0%	0%	0%	2%	79%	0%	0%	0%	0%	0%	0%	0%	
4																		
No of months	347	420	420	420	420	420	418	415	36	12	420	420	420	420	420	420	409	0
Return (%)	**1.26**	**1.45**	**1.22**	**1.21**	**1.27**	**1.23**	**1.44**	**2.05**	**1.95**	**-3.33**	**1.80**	**1.31**	**1.24**	**1.34**	**1.20**	**1.55**	**1.49**	
t-value	2.43	3.72	5.23	4.45	4.40	4.38	3.36	4.01	1.43	-0.68	4.48	4.14	3.55	3.62	3.63	3.54	2.95	
p-value	2%	0%	0%	0%	0%	0%	0%	0%	16%	51%	0%	0%	0%	0%	0%	0%	0%	
High																		
No of months	414	420	420	420	420	420	419	418	102	295	420	420	420	420	420	420	408	43
Return (%)	**1.28**	**1.56**	**1.23**	**1.10**	**1.35**	**1.11**	**1.41**	**0.61**	**1.52**	**0.64**	**1.03**	**1.17**	**1.10**	**1.52**	**1.51**	**1.36**	**1.08**	**1.60**
t-value	3.16	3.96	4.83	3.54	4.29	3.34	3.23	1.38	0.98	1.07	2.38	3.58	2.75	4.33	4.02	2.97	2.40	0.61
p-value	0%	0%	0%	0%	0%	0%	0%	17%	33%	29%	2%	0%	1%	0%	0%	0%	2%	55%
Low - High																		
No of months	210	420	420	420	420	420	419	388	0	0	420	420	420	420	420	420	396	0
Return (%)	**0.18**	**0.08**	**0.26**	**0.46**	**-0.02**	**0.32**	**0.52**	**0.82**			**0.50**	**0.52**	**0.60**	**-0.41**	**0.14**	**0.49**	**0.17**	
t-value	0.19	0.28	1.86	3.35	-0.08	1.73	1.18	1.77			1.09	2.78	3.86	-1.13	0.52	1.71	0.38	
p-value	85%	78%	6%	0%	93%	8%	24%	8%			28%	1%	0%	26%	61%	9%	71%	
			*	***		*		*				***	***			*		

Panel B: High investment irreversibility in business cycle stages

	High investment irreversibility - Upturn									High investment irreversibility - Downturn								
Industries	0	1	2	3	4	5	7	8	9	0	1	2	3	4	5	7	8	9
Low																		
No of months	116	236	236	236	236	236	236	219	0	94	184	184	184	184	184	184	171	0
Return (%)	**1.74**	**1.28**	**1.21**	**1.36**	**1.08**	**0.84**	**1.14**	**0.66**		**1.72**	**2.08**	**1.84**	**1.82**	**1.65**	**2.20**	**2.96**	**2.61**	
t-value	1.56	2.59	4.02	3.61	2.63	2.25	1.89	1.11		1.53	3.19	4.75	3.80	2.80	4.21	4.43	3.57	
p-value	12%	1%	0%	0%	1%	3%	6%	27%		13%	0%	0%	0%	1%	0%	0%	0%	
2																		
No of months	186	236	236	236	236	236	236	236	3	164	184	184	184	184	184	184	184	25
Return (%)	**1.03**	**1.30**	**1.05**	**1.02**	**0.88**	**0.79**	**0.65**	**1.62**	**-6.58**	**1.59**	**2.31**	**1.67**	**1.66**	**1.46**	**1.97**	**1.98**	**2.47**	**-0.35**
t-value	1.43	2.58	3.59	2.91	2.76	2.29	1.29	2.77	-1.47	1.85	3.31	4.56	3.63	3.30	4.53	3.02	3.56	-0.19
p-value	15%	1%	0%	0%	1%	2%	20%	1%	28%	7%	0%	0%	0%	0%	0%	0%	0%	85%
3																		
No of months	182	236	236	236	236	236	236	230	20	160	184	184	184	184	184	184	184	22
Return (%)	**0.75**	**1.08**	**0.99**	**1.06**	**1.29**	**1.00**	**1.36**	**1.31**	**2.75**	**1.19**	**1.96**	**1.91**	**1.66**	**1.47**	**2.15**	**1.62**	**1.94**	**2.78**
t-value	1.38	2.30	3.44	3.04	3.85	2.82	2.53	2.37	1.44	1.46	2.87	5.20	3.56	3.13	4.80	2.62	2.65	1.95
p-value	17%	2%	0%	0%	0%	1%	1%	2%	17%	15%	0%	0%	0%	0%	0%	1%	1%	6%
4																		
No of months	182	236	236	236	236	236	235	236	3	165	184	184	184	184	184	183	179	33
Return (%)	**1.08**	**1.11**	**0.86**	**0.93**	**1.08**	**0.66**	**1.21**	**1.19**	**-1.88**	**1.46**	**1.88**	**1.68**	**1.58**	**1.50**	**1.95**	**1.73**	**3.20**	**2.30**
t-value	1.59	2.40	3.03	2.70	3.08	1.83	2.09	1.74	-0.49	1.85	2.84	4.35	3.59	3.14	4.49	2.71	4.16	1.58
p-value	11%	2%	0%	1%	0%	7%	4%	8%	68%	7%	1%	0%	0%	0%	0%	1%	0%	12%
High																		
No of months	230	236	236	236	236	236	236	235	47	184	184	184	184	184	184	183	183	55
Return (%)	**0.75**	**0.80**	**0.77**	**0.77**	**0.95**	**0.52**	**0.93**	**0.11**	**1.35**	**1.94**	**2.53**	**1.81**	**1.53**	**1.87**	**1.87**	**2.03**	**1.27**	**1.67**
t-value	1.43	1.77	2.47	1.93	2.56	1.23	1.65	0.18	0.53	3.08	3.71	4.35	3.09	3.46	3.53	2.96	1.97	0.89
p-value	15%	8%	1%	5%	1%	22%	10%	86%	60%	0%	0%	0%	0%	0%	0%	0%	5%	38%
Low - High																		
No of months	116	236	236	236	236	236	236	218	0	94	184	184	184	184	184	183	170	0
Return (%)	**1.01**	**0.48**	**0.44**	**0.59**	**0.13**	**0.32**	**0.20**	**0.21**		**-0.85**	**-0.45**	**0.03**	**0.29**	**-0.22**	**0.33**	**0.93**	**1.61**	
t-value	0.79	1.29	2.39	3.27	0.40	1.27	0.35	0.35		-0.62	-1.10	0.14	1.38	-0.48	1.18	1.36	2.21	
p-value	43%	20%	2%	0%	69%	21%	72%	73%		54%	27%	89%	17%	63%	24%	18%	3%	
			**	***													**	

Panel C: Low investment irreversibility in business cycle stages

	Low investment irreversibility - Upturn									Low investment irreversibility - Downturn								
Industries	0	1	2	3	4	5	7	8	9	0	1	2	3	4	5	7	8	9
Low																		
No of months	0	236	236	236	236	236	236	224	0	0	184	184	184	184	184	184	172	0
Return (%)		**1.11**	**1.42**	**1.38**	**0.70**	**1.19**	**1.03**	**1.02**			**2.06**	**2.04**	**2.11**	**1.65**	**2.24**	**2.91**	**1.67**	
t-value		1.85	3.85	3.23	1.25	2.94	2.00	1.64			2.49	3.32	3.58	2.22	4.01	4.21	2.43	
p-value		7%	0%	0%	21%	0%	5%	10%			1%	0%	0%	3%	0%	0%	2%	
2																		
No of months	5	236	236	236	236	236	236	236	0	2	184	184	184	184	184	184	184	0
Return (%)	**10.18**	**0.77**	**1.19**	**1.27**	**0.92**	**0.71**	**1.03**	**0.75**		**-3.41**	**1.35**	**1.91**	**1.74**	**2.40**	**2.19**	**2.35**	**2.26**	
t-value	1.62	1.51	3.35	3.12	1.98	1.65	1.97	1.35		-1.00	2.14	4.10	3.25	3.72	4.08	3.62	3.04	
p-value	18%	13%	0%	0%	5%	10%	5%	18%		50%	3%	0%	0%	0%	0%	0%	0%	
3																		
No of months	38	236	236	236	236	236	236	236	0	23	184	184	184	184	184	184	184	0
Return (%)	**-0.17**	**1.00**	**0.92**	**1.26**	**1.21**	**1.10**	**1.30**	**0.96**		**-0.92**	**2.01**	**1.99**	**1.70**	**2.04**	**2.24**	**1.68**	**2.00**	
t-value	-0.09	1.88	2.66	3.04	2.53	2.52	2.59	1.74		-0.31	2.95	4.21	3.01	3.26	4.63	2.84	3.02	
p-value	93%	6%	1%	0%	1%	1%	1%	8%		76%	0%	0%	0%	0%	0%	1%	0%	
4																		
No of months	10	236	236	236	236	236	236	226	0	2	184	184	184	184	184	184	183	0
Return (%)	**-0.29**	**1.57**	**0.88**	**0.96**	**0.95**	**0.66**	**0.84**	**0.54**		**-18.51**	**2.09**	**1.86**	**1.59**	**1.84**	**1.89**	**2.46**	**2.65**	
t-value	-0.05	3.19	2.32	2.26	2.22	1.58	1.44	0.99		-8.14	3.15	3.51	2.74	2.86	3.60	3.72	2.96	
p-value	96%	0%	2%	2%	3%	12%	15%	32%		8%	0%	0%	1%	0%	0%	0%	0%	
High																		
No of months	178	236	236	236	236	236	236	236	27	117	184	184	184	184	184	184	172	16
Return (%)	**1.08**	**0.29**	**0.58**	**0.67**	**1.42**	**0.94**	**0.78**	**0.66**	**-0.51**	**-0.03**	**1.97**	**1.92**	**1.66**	**1.66**	**2.25**	**2.10**	**1.67**	**5.15**
t-value	1.29	0.57	1.41	1.41	3.27	1.97	1.41	1.09	-0.18	-0.04	2.68	3.71	2.43	2.86	3.74	2.75	2.48	1.00
p-value	20%	57%	16%	16%	0%	5%	16%	28%	86%	97%	1%	0%	2%	0%	0%	1%	1%	33%
Low - High																		
No of months	0	236	236	236	236	236	236	224	0	0	184	184	184	184	184	184	172	0
Return (%)		**0.82**	**0.84**	**0.71**	**-0.72**	**0.25**	**0.25**	**0.30**			**0.09**	**0.12**	**0.45**	**-0.01**	**-0.01**	**0.81**	**0.00**	
t-value		1.42	3.62	3.80	-1.54	0.78	0.68	0.49			0.12	0.38	1.75	-0.01	-0.02	1.73	0.00	
p-value		16%	0%	0%	12%	43%	50%	63%			90%	70%	8%	99%	99%	8%	100%	
			***	***									*			*		

Table 6: The accrual anomaly among high vs. low financial constraint firms

This table presents the returns of the accrual decile portfolios and of the accrual strategy across the business cycle and in different stages in high vs. low financial constraint subsamples. Stocks are non financial, non utilities firms listed in the three main exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers the period from January 1976 to December 2006. Only those stocks with available information to construct the accrual ratio are included. The original sample is partitioned using the net payout ratio into the top 50% (low financial constraint) and bottom 50% (high financial constraint). For detailed construction of the net payout ratio, refer to the Appendix.

Following Sloan (1996), we rank stocks into deciles based on the accrual ratio measured in December year t-1 and held from July year t to June year t+1. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. We assign positive index to upturn (236 out of 420 months) and negative index to downturn (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. Low – High represents the returns of the portfolios that go long in stocks with low accrual and go short in stocks with high accrual. T-statistics and the corresponding p values are presented. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

	High financial constraint			Low financial constraint		
	All	Upturn	Downturn	All	Upturn	Downturn
Low - Return (%)	**1.44**	**1.16**	**2.03**	**1.52**	**1.21**	**2.04**
t-value	4.40	2.89	3.68	5.21	3.54	4.08
p-value	0%	0%	0%	0%	0%	0%
2- Return (%)	**1.46**	**1.13**	**1.94**	**1.33**	**1.29**	**1.73**
t-value	4.36	2.95	3.92	5.15	4.13	4.30
p-value	0%	0%	0%	0%	0%	0%
3 - Return (%)	**1.35**	**1.21**	**1.94**	**1.50**	**1.14**	**1.87**
t-value	4.20	3.19	3.94	6.24	3.91	4.81
p-value	0%	0%	0%	0%	0%	0%
4 - Return (%)	**1.40**	**1.10**	**1.80**	**1.38**	**1.04**	**1.87**
t-value	4.19	2.96	3.75	5.74	3.39	4.82
p-value	0%	0%	0%	0%	0%	0%
5 - Return (%)	**1.53**	**1.10**	**1.91**	**1.35**	**1.01**	**1.90**
t-value	4.68	2.90	3.86	5.51	3.40	4.93
p-value	0%	0%	0%	0%	0%	0%
6 - Return (%)	**1.35**	**1.15**	**1.89**	**1.40**	**1.12**	**1.88**
t-value	3.96	2.93	3.80	5.52	3.63	4.65
p-value	0%	0%	0%	0%	0%	0%
7 - Return (%)	**1.38**	**1.04**	**1.74**	**1.37**	**1.01**	**1.83**
t-value	3.95	2.56	3.47	5.87	3.42	4.62
p-value	0%	1%	0%	0%	0%	0%
8 - Return (%)	**1.16**	**0.82**	**1.89**	**1.22**	**0.89**	**1.66**
t-value	3.20	2.04	3.61	4.93	2.94	4.23
p-value	0%	4%	0%	0%	0%	0%
9 - Return (%)	**1.06**	**0.76**	**1.73**	**1.23**	**0.84**	**1.71**
t-value	2.77	1.80	3.14	4.74	2.70	3.99
p-value	0%	7%	0%	0%	1%	0%
High - Return (%)	**0.82**	**0.43**	**1.59**	**1.25**	**0.83**	**1.74**
t-value	1.93	0.89	2.44	4.18	2.28	3.66
p-value	5%	38%	2%	0%	2%	0%
(Low-High) - Return (%)	**0.62**	**0.74**	**0.44**	**0.27**	**0.39**	**0.30**
t-value	3.07	3.63	1.77	1.90	2.51	1.54
p-value	0%	0%	8%	6%	1%	13%
	***	***	*	*	***	

Table 7: The accrual anomaly in the presence of financial constraint in different industries

This table presents the returns of the accrual quintile portfolios and of the accrual strategy across the business cycle and in different stages in high vs. low financial constraint subsamples. Stocks are non financial, non utilities firms listed in the three main exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers the period from January 1976 to December 2006. Only those stocks with available information to construct the accrual ratio are included. The original sample is partitioned using the net payout ratio into the top 50% (low financial constraint) and bottom 50% (high financial constraint). For detailed construction of the financial constraint ratio, refer to the Appendix.

Stocks are classified into different industry groups using the first digit of the industry code (data324) in Compustat. Within each industry group, following Sloan (1996), we rank stocks into quintiles based on the accrual ratio measured in December year t-1 and held from July year t to June year t+1. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. We assign positive index to upturn (236 out of 420 months) and negative index to downturn (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. Low – High represents the returns of the portfolios that go long in stocks with low accrual and go short in stocks with high accrual. T-statistics and the corresponding p values are presented. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

Panel A: High vs. low financial constraint

Industries	High financial constraint 0	1	2	3	4	5	7	8	9	Low financial constraint 0	1	2	3	4	5	7	8	9
Low																		
No of months	12	420	420	420	420	420	420	420	0	120	420	420	420	420	420	390	352	0
Return (%)	**-1.38**	**1.45**	**1.60**	**1.73**	**1.13**	**1.53**	**1.78**	**1.94**		**2.39**	**1.63**	**1.50**	**1.55**	**1.39**	**1.33**	**1.85**	**1.30**	
t-value	-0.34	3.26	5.15	4.79	2.98	4.32	4.39	4.40		1.52	3.77	6.09	5.35	4.24	4.78	4.22	2.45	
p-value	74%	0%	0%	0%	0%	0%	0%	0%		13%	0%	0%	0%	0%	0%	0%	1%	
2																		
No of months	108	420	420	420	420	420	420	420	0	249	420	420	420	420	420	396	402	12
Return (%)	**0.54**	**1.48**	**1.43**	**1.42**	**1.36**	**1.24**	**1.47**	**1.57**		**1.46**	**1.42**	**1.43**	**1.36**	**1.31**	**1.54**	**1.92**	**1.61**	**-0.05**
t-value	0.50	3.47	5.15	4.08	3.56	3.87	3.61	3.59		2.33	3.75	6.45	5.09	4.93	5.82	4.62	4.29	-0.02
p-value	62%	0%	0%	0%	0%	0%	0%	0%		2%	0%	0%	0%	0%	0%	0%	0%	98%
3																		
No of months	200	420	420	420	420	420	420	420	4	300	420	420	420	420	420	405	390	36
Return (%)	**0.29**	**1.42**	**1.37**	**1.45**	**1.28**	**1.38**	**1.40**	**1.75**	**-10.39**	**1.19**	**1.62**	**1.35**	**1.35**	**1.39**	**1.60**	**2.08**	**1.42**	**2.94**
t-value	0.38	3.33	4.70	4.18	3.46	4.40	3.45	3.74	-1.97	2.07	4.24	5.85	4.92	4.99	5.80	5.24	3.61	2.21
p-value	71%	0%	0%	0%	0%	0%	0%	0%	14%	4%	0%	0%	0%	0%	0%	0%	0%	3%
4																		
No of months	116	420	420	420	420	420	420	405	0	263	420	420	420	420	420	402	402	12
Return (%)	**0.08**	**1.57**	**1.36**	**1.28**	**1.46**	**1.05**	**1.65**	**1.53**		**1.35**	**1.69**	**1.23**	**1.19**	**1.42**	**1.43**	**1.85**	**1.25**	**-0.82**
t-value	0.07	3.65	4.44	3.60	4.40	3.17	3.88	3.23		2.82	4.84	5.34	4.47	5.52	5.35	5.02	3.05	-0.34
p-value	94%	0%	0%	0%	0%	0%	0%	0%		1%	0%	0%	0%	0%	0%	0%	0%	74%
High																		
No of months	376	420	420	420	420	420	420	418	97	405	420	420	420	420	420	420	420	90
Return (%)	**0.47**	**1.68**	**1.21**	**0.97**	**1.59**	**1.41**	**1.29**	**1.44**	**2.29**	**1.42**	**1.14**	**1.21**	**1.22**	**1.34**	**1.27**	**1.26**	**0.85**	**1.18**
t-value	0.89	3.98	3.82	2.38	4.53	3.80	2.75	2.76	1.73	3.40	3.25	4.83	4.12	4.52	4.20	3.13	1.95	0.69
p-value	38%	0%	0%	2%	0%	0%	1%	1%	9%	0%	0%	0%	0%	0%	0%	0%	5%	49%
Low - High																		
No of months	12	420	420	420	420	420	420	418	0	111	420	420	420	420	420	390	352	0
Return (%)	**-4.79**	**-0.23**	**0.39**	**0.77**	**-0.46**	**0.12**	**0.49**	**0.59**		**0.32**	**0.49**	**0.30**	**0.33**	**0.05**	**0.05**	**0.41**	**0.52**	
t-value	-0.91	-0.69	2.10	5.04	-1.62	0.56	1.63	1.20		0.18	1.30	2.41	2.66	0.18	0.29	1.22	1.03	
p-value	38%	49%	4%	0%	11%	57%	10%	23%		86%	19%	2%	1%	85%	77%	22%	30%	
			**	***								**	***					

Panel B: High financial constraint in business cycle stages

	High financial constraint - Upturn									High financial constraint - Downturn								
Industries	0	1	2	3	4	5	7	8	9	0	1	2	3	4	5	7	8	9
Low																		
No of months	8	236	236	236	236	236	236	236	0	4	184	184	184	184	184	184	184	0
Return (%)	**1.42**	**0.99**	**1.32**	**1.50**	**0.95**	**0.85**	**0.87**	**1.32**		**-6.97**	**2.03**	**1.96**	**2.03**	**1.36**	**2.40**	**2.95**	**2.75**	
t-value	0.26	1.81	3.55	3.36	2.08	2.06	1.71	2.39		-1.39	2.79	3.74	3.42	2.14	3.97	4.54	3.83	
p-value	80%	7%	0%	0%	4%	4%	9%	2%		26%	1%	0%	0%	3%	0%	0%	0%	
2																		
No of months	45	236	236	236	236	236	236	236	0	63	184	184	184	184	184	184	184	0
Return (%)	**-0.17**	**0.91**	**1.09**	**1.27**	**0.91**	**0.64**	**1.12**	**1.07**		**1.05**	**2.20**	**1.87**	**1.62**	**1.93**	**2.00**	**1.93**	**2.21**	
t-value	-0.12	1.69	3.23	2.92	1.93	1.57	2.06	1.92		0.68	3.23	4.04	2.84	3.09	3.96	3.11	3.17	
p-value	90%	9%	0%	0%	6%	12%	4%	6%		50%	0%	0%	1%	0%	0%	0%	0%	
3																		
No of months	128	236	236	236	236	236	236	236	1	72	184	184	184	184	184	184	184	3
Return (%)	**0.25**	**1.17**	**1.05**	**1.24**	**1.01**	**0.78**	**1.13**	**1.30**	**-15.47**	**0.38**	**1.75**	**1.77**	**1.72**	**1.62**	**2.14**	**1.75**	**2.33**	**-8.70**
t-value	0.26	2.23	2.99	2.86	2.46	1.91	2.08	2.18	0.00	0.28	2.47	3.64	3.06	2.46	4.48	2.86	3.12	-1.23
p-value	80%	3%	0%	0%	1%	6%	4%	3%	0%	78%	1%	0%	0%	1%	0%	0%	0%	34%
4																		
No of months	55	236	236	236	236	236	236	226	0	61	184	184	184	184	184	184	179	0
Return (%)	**-2.03**	**0.87**	**1.02**	**1.02**	**1.21**	**0.46**	**1.22**	**0.49**		**1.99**	**2.47**	**1.80**	**1.61**	**1.79**	**1.81**	**2.21**	**2.84**	
t-value	-1.24	1.68	2.60	2.35	2.87	1.08	2.19	0.81		1.35	3.42	3.71	2.73	3.36	3.51	3.35	3.83	
p-value	22%	9%	1%	2%	0%	28%	3%	42%		18%	0%	0%	1%	0%	0%	0%	0%	
High																		
No of months	216	236	236	236	236	236	236	236	43	160	184	184	184	184	184	184	182	54
Return (%)	**0.32**	**0.98**	**0.61**	**0.47**	**1.24**	**0.92**	**0.71**	**0.53**	**0.04**	**0.68**	**2.57**	**1.98**	**1.60**	**2.03**	**2.04**	**2.04**	**2.62**	**4.09**
t-value	0.42	2.04	1.53	0.94	2.94	2.00	1.23	0.90	0.02	0.92	3.50	3.89	2.38	3.45	3.37	2.65	2.83	2.28
p-value	67%	4%	13%	35%	0%	5%	22%	37%	98%	36%	0%	0%	2%	0%	0%	1%	1%	3%
Low - High																		
No of months	8	236	236	236	236	236	236	236	0	4	184	184	184	184	184	184	182	0
Return (%)	**-3.19**	**0.01**	**0.71**	**1.03**	**-0.29**	**-0.07**	**0.16**	**0.79**		**-7.99**	**-0.53**	**-0.01**	**0.43**	**-0.67**	**0.36**	**0.91**	**0.34**	
t-value	-0.44	0.02	3.19	5.04	-0.81	-0.24	0.43	1.57		-1.13	-0.99	-0.05	1.89	-1.50	1.02	1.81	0.36	
p-value	68%	99%	0%	0%	42%	81%	66%	12%		34%	32%	96%	6%	13%	31%	7%	72%	
			***	***									*			*		

Panel C: Low financial constraint in business cycle stages

	Low financial constraint - Upturn									Low financial constraint - Downturn								
Industries	0	1	2	3	4	5	7	8	9	0	1	2	3	4	5	7	8	9
Low																		
No of months	76	236	236	236	236	236	219	191	0	44	184	184	184	184	184	171	161	0
Return (%)	**2.87**	**1.26**	**1.26**	**1.32**	**0.99**	**0.99**	**1.37**	**0.48**		**1.55**	**2.10**	**1.82**	**1.84**	**1.89**	**1.76**	**2.46**	**2.26**	
t-value	1.29	2.42	4.24	3.62	2.58	2.96	2.55	0.68		0.81	2.90	4.37	3.94	3.38	3.78	3.40	2.85	
p-value	20%	2%	0%	0%	1%	0%	1%	50%		43%	0%	0%	0%	0%	0%	0%	0%	
2																		
No of months	145	236	236	236	236	236	219	230	1	104	184	184	184	184	184	177	172	11
Return (%)	**1.02**	**1.14**	**1.12**	**1.01**	**1.19**	**1.09**	**1.64**	**1.16**	**-1.40**	**2.08**	**1.78**	**1.83**	**1.80**	**1.48**	**2.11**	**2.27**	**2.23**	**0.07**
t-value	1.21	2.44	4.00	2.99	3.71	3.30	3.26	2.49	0.00	2.25	2.84	5.14	4.23	3.28	4.94	3.27	3.59	0.03
p-value	23%	2%	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	0%	0%	0%	0%	0%	98%
3																		
No of months	161	236	236	236	236	236	221	213	12	139	184	184	184	184	184	184	177	24
Return (%)	**1.91**	**1.09**	**0.93**	**1.05**	**1.10**	**1.03**	**1.50**	**1.36**	**3.01**	**0.34**	**2.31**	**1.89**	**1.72**	**1.75**	**2.34**	**2.78**	**1.50**	**2.90**
t-value	2.83	2.49	3.25	3.12	3.37	2.90	2.79	2.68	1.09	0.36	3.46	5.03	3.83	3.68	5.41	4.74	2.42	1.95
p-value	1%	1%	0%	0%	0%	0%	1%	1%	30%	72%	0%	0%	0%	0%	0%	0%	2%	6%
4																		
No of months	146	236	236	236	236	236	219	230	1	117	184	184	184	184	184	183	172	11
Return (%)	**0.69**	**1.44**	**0.80**	**0.92**	**1.04**	**0.93**	**1.55**	**1.38**	**-9.14**	**2.17**	**2.01**	**1.78**	**1.54**	**1.90**	**2.07**	**2.22**	**1.07**	**-0.06**
t-value	1.13	3.34	2.82	2.77	3.48	2.71	3.36	2.42	0.00	2.87	3.50	4.72	3.55	4.30	4.95	3.73	1.84	-0.02
p-value	26%	0%	1%	1%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	7%	98%
High																		
No of months	223	236	236	236	236	236	236	236	42	182	184	184	184	184	184	184	184	48
Return (%)	**1.20**	**0.66**	**0.73**	**0.87**	**1.25**	**0.64**	**0.60**	**0.66**	**1.60**	**1.69**	**1.75**	**1.82**	**1.68**	**1.45**	**2.09**	**2.11**	**1.11**	**0.80**
t-value	2.15	1.59	2.42	2.33	3.63	1.69	1.18	1.10	0.58	2.69	2.95	4.37	3.49	2.83	4.27	3.26	1.71	0.39
p-value	3%	11%	2%	2%	0%	9%	24%	27%	57%	1%	0%	0%	0%	1%	0%	0%	9%	70%
Low - High																		
No of months	69	236	236	236	236	236	219	191	0	42	184	184	184	184	184	171	161	0
Return (%)	**0.67**	**0.59**	**0.53**	**0.46**	**-0.26**	**0.35**	**0.37**	**0.18**		**-0.26**	**0.35**	**0.00**	**0.16**	**0.45**	**-0.32**	**0.47**	**0.93**	
t-value	0.26	1.29	3.55	3.03	-0.84	1.48	0.87	0.27		-0.11	0.57	0.00	0.78	1.08	-1.07	0.85	1.20	
p-value	79%	20%	0%	0%	40%	14%	39%	79%		91%	57%	100%	43%	28%	29%	39%	23%	
			***	***														

Table 8: The cyclicality of the accrual anomaly among firms with high vs. low investment irreversibility and high vs. low financial constraint

This table presents the returns of the accrual decile portfolios and of the accrual strategy across the business cycle and in different stages in two dimensions, i.e. investment irreversibility and financial constraint. Stocks are non financial, non utilities firms listed in the three main exchanges in the US market (NYSE, AMEX and NASDAQ). Stocks with price below $5 and falling into the smallest NYSE decile are excluded. The sample covers the period from January 1976 to December 2006. Only those stocks with available information to construct the accrual ratio are included. The original sample is partitioned using the net payout ratio into the top 50% (low financial constraint) and bottom 50% (high financial constraint). It is also independently partitioned using the depreciation charge rate into the top 50% (low investment irreversibility) and bottom 50% (high investment irreversibility). For detailed construction of the net payout ratio and depreciation charge ratio, refer to the Appendix.

Following Sloan (1996), we rank stocks into deciles based on the accrual ratio measured in December year t-1 and held from July year t to June year t+1. The Chicago Fed National Activity Index is a weighted average of 85 existing monthly national economic indicators. A positive index indicates that growth is above the trend, and a negative index indicates that growth is below the trend. We assign positive index to upturn (236 out of 420 months) and negative index to downturn (184 out of 420 months). Equally weighted raw returns of the portfolios are estimated each calendar month. Low – High represents the returns of the portfolios that go long in stocks with low accrual and go short in stocks with high accrual. T-statistics and the corresponding p values are presented. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

	High IIR – High FC		High IIR – Low FC		Low IIR – High FC		Low IIR – Low FC	
	Upturn	Downturn	Upturn	Downturn	Upturn	Downturn	Upturn	Downturn
Low - Return (%)	**1.16**	**2.04**	**1.15**	**1.91**	**1.11**	**2.10**	**1.38**	**2.22**
t-value	2.93	3.80	3.54	4.69	2.53	3.56	3.55	3.78
p-value	0%	0%	0%	0%	1%	0%	0%	0%
2 - Return (%)	**1.14**	**1.83**	**1.22**	**1.77**	**1.24**	**1.97**	**1.26**	**1.80**
t-value	3.10	3.86	4.34	4.95	2.94	3.53	3.44	3.28
p-value	0%	0%	0%	0%	0%	0%	0%	0%
3 - Return (%)	**1.26**	**1.84**	**1.06**	**1.80**	**1.25**	**2.04**	**1.30**	**1.85**
t-value	3.27	3.69	3.65	4.78	2.95	3.73	3.68	3.77
p-value	0%	0%	0%	0%	0%	0%	0%	0%
4 - Return (%)	**0.96**	**1.73**	**0.88**	**1.68**	**1.02**	**1.74**	**1.23**	**2.04**
t-value	2.78	3.70	2.92	4.49	2.46	3.12	3.61	4.27
p-value	1%	0%	0%	0%	1%	0%	0%	0%
5 - Return (%)	**1.10**	**2.01**	**0.99**	**1.73**	**1.05**	**1.91**	**1.23**	**2.12**
t-value	2.93	4.19	3.33	4.75	2.53	3.52	3.58	4.84
p-value	0%	0%	0%	0%	1%	0%	0%	0%
6 - Return (%)	**1.15**	**1.89**	**1.08**	**1.96**	**1.21**	**1.72**	**1.11**	**1.84**
t-value	3.08	3.91	3.76	4.76	2.65	3.10	3.21	3.78
p-value	0%	0%	0%	0%	1%	0%	0%	0%
7 - Return (%)	**0.94**	**1.79**	**1.02**	**1.80**	**0.99**	**1.66**	**1.20**	**2.02**
t-value	2.52	3.79	3.52	4.65	2.18	3.03	3.44	4.23
p-value	1%	0%	0%	0%	3%	0%	0%	0%
8 - Return (%)	**0.92**	**1.86**	**0.72**	**1.58**	**0.85**	**1.81**	**0.90**	**1.64**
t-value	2.51	3.92	2.46	4.24	1.87	3.04	2.53	3.33
p-value	1%	0%	1%	0%	6%	0%	1%	0%
9 - Return (%)	**0.96**	**2.07**	**0.85**	**1.60**	**0.64**	**1.77**	**0.70**	**1.77**
t-value	2.51	4.28	2.88	4.27	1.41	2.82	1.92	3.49
p-value	1%	0%	0%	0%	16%	1%	6%	0%
High - Return (%)	**0.35**	**1.59**	**0.90**	**1.70**	**0.39**	**1.60**	**0.77**	**1.88**
t-value	0.82	2.81	2.67	3.89	0.75	2.31	1.90	3.51
p-value	41%	1%	1%	0%	45%	2%	6%	0%
(Low – High) - Return (%)	**0.81**	**0.46**	**0.25**	**0.21**	**0.72**	**0.50**	**0.62**	**0.34**
t-value	3.15	1.51	1.55	1.08	2.90	1.62	2.74	1.17
p-value	0%	13%	12%	28%	0%	11%	1%	24%
	***				***		***	

Table 9: The accrual anomaly in asset pricing model

This table reports the accrual anomaly at firm level when returns are risk adjusted. We start with the sample used in the analysis of the accrual investment strategy using portfolio sorting in this paper, i.e. non-financial, non-utility stocks, from January 1972 to December 2006, with available data on accrual and net fixed assets at the beginning of the year, stock price not below $5 and market capitalisation in previous month not falling within the smallest NYSE size decile. We then impose a number of further constraints that there should be data on stock returns, market capitalization and book-to-market in the current year and in the 36 months prior to the current month. According to Avramov and Chordia (2006), these conditions are required to ensure that the estimation of firm level factor loadings is not noisy.

The table presents the time-series averages of individual stocks' cross-sectional OLS regression coefficients (equation (2)) for all stocks listed in NYSE – AMEX – NASDAQ:

$$R^*_{jt} = c_{0t} + c_{ACC,t} \times ACC_{jt-1} + \begin{bmatrix} c_{1t} & c_{2t} & c_{3t} & c_{4t} \end{bmatrix} \times \begin{bmatrix} Size_{jt-1} \\ BM_{jt-1} \\ PR_{jt-1} \\ Turnover_{jt-1} \end{bmatrix} + u_{jt} \quad (2)$$

in which R^*_{jt} is the risk-adjusted returns of individual stocks. In panel A we do not adjust the return for risk, therefore run the cross sectional OLS regression in equation (2) using raw returns in replacement of R^*_{jt}.

In panel B, when the Fama and French three factor model is used as the base asset pricing model, the risk adjusted return in the OLS regression (2) is measured as the sum of the constant component of alpha and error term in the following time-series regressions for individual stocks:

$$R_{jt} - R_{Ft} = \alpha_j + \sum_{f=1}^{F} \begin{bmatrix} \beta_{j,1} & \beta_{j,2} & \beta_{j,3} & \beta_{j,4} \end{bmatrix} \times \begin{bmatrix} 1 \\ Firm_{j,t-1} \\ MWF_{t-1} \\ Firm_{j,t-1} \times MWF_{t-1} \end{bmatrix} \times F_{ft} + e_{jt} \quad (1)$$

R_{jt} is the return on stock j at time t; MWF_{t-1} is the one month lagged market wide factor default spread, which is used to proxy for the business cycle variable. F_{ft} represents priced risk factors. In panel B, when the Fama and French three factor model is used as the base asset pricing model, F_{ft} includes the market factor, the HML and SMB factors. Firm characteristic $Firm_{j,t-1}$ is the firm level measurement of financial constraint status and the extent to which firms' assets are irreversible. For detailed construction of firms' financial constraint and investment irreversibility, refer to Appendix. In Panel B.1., the model is first fully restricted, i.e. $\beta_{j,2} = \beta_{j,3} = \beta_{j,4} = 0$. In

Panel B.2, when betas are conditioned on the business cycle factor, the restrictions are $\beta_{j,2} = \beta_{j,4} = 0$. In Panel B.3, B.4 and B.5, in addition to the business cycle factor, firm characteristics are supplemented as the conditioning variable. As betas are conditioned on both the firm level variables and the business cycle factor, no restriction is imposed.

In panel C, the risk adjusted return R_{jt}^{*} in the OLS regression (2) is measured as the sum of alpha and the error term in the following time-series regressions for individual stocks:

$$R_{jt} = \alpha_j + [\gamma_{j,1} \quad \gamma_{j,2} \quad \gamma_{j,3} \quad \gamma_{j,4}] \times \begin{bmatrix} R_t^{30} \\ Def_t \\ Term_t \\ Dy_t \end{bmatrix} + e_{jt} \qquad (3)$$

In this regression, the business cycle factors are used to adjust risks for the raw individual stock returns. The four factors are widely used in the literature. R_t^{30} is the 30 day T bill rate in % at time t, Def_t is the default spread in % between the returns of US corporate bonds rated BAA and AAA, taken from Datastream database, at time t. $Term_t$ is the term spread in % between the returns of 10 year Treasury bonds and 1 year Treasury bonds, both taken from CRSP. Dy_t is the dividend yield at time t of stocks listed in NYSE, AMEX and NASDAQ, calculated as $100 \times e^{ldy}$ where ldy is the naturla log of the imputed dividend yield taken from Jacob Boudoukh's data for the paper Boudoukh et al. (2007). In Boudoukh's data, dly is the natural log of the imputed dividend yield calculated from value weighted returns, including and excluding distributions, for NYSE, AMEX, NASDAQ, taken from CRSP.

In equation (2), $ACC_{j,t-1}$ is the accrual ratio of firm j in December of the previous year. The vector of size, book-to-market ratio, past return $PR_{j,t-1}$ and stock turnover in equation (2) represent the control factors for other well documented asset pricing anomalies (size, value, momentum, and liquidity respectively). For detailed construction of the variables, refer to Appendix.

The null hypothesis is that the coefficient $c_{ACC,t}$ attached to the accrual variable is not significantly different from zero, meaning that the accrual effect is captured when returns are adjusted for risks in stage one. The t-statistics are corrected for autocorrelation and heteroskedasticity using the Newey and West (1987) procedure. *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively. All coefficients are multiplied by 100.

A. Raw returns

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-1.28	0.16	0.40	0.82	0.82	-0.16	0.05	-0.02	0.15	1.30	6.8%
t value	-3.59	2.18	1.13	2.58	3.33	-3.94	0.68	-0.39	1.51	5.15	
p value	0%	3%	26%	1%	0%	0%	50%	70%	13%	0%	
	***	**		***	***	***				***	

B. Fama and French three factor model

B.1. Unconditional

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-0.94	0.01	0.56	0.84	0.84	-0.09	0.05	-0.08	0.22	0.05	3.4%
t value	-2.66	0.16	1.75	2.98	3.89	-4.80	1.05	-1.55	3.39	0.65	
p value	1%	88%	8%	0%	0%	0%	29%	12%	0%	52%	
	***		*	***	***	***			***		

B.2. Betas are conditioned on the business cycle factor

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-1.06	-0.03	0.50	0.80	0.81	-0.09	0.05	-0.07	0.24	0.04	3.2%
t value	-2.98	-0.43	1.61	2.99	3.94	-4.81	1.14	-1.48	3.85	0.54	
p value	0%	66%	11%	0%	0%	0%	25%	14%	0%	59%	
	***			***	***	***			***		

B.3. Betas are conditioned on the business cycle factor and financial constraint

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-0.83	-0.03	0.53	0.80	0.86	-0.08	0.06	-0.06	0.22	0.07	3.1%
t value	-2.17	-0.60	1.75	3.14	4.30	-4.51	1.22	-1.38	3.91	1.10	
p value	3%	55%	8%	0%	0%	0%	22%	17%	0%	27%	
	**		*	***	***	***			***		

B.4. Betas are conditioned on the business cycle factor and investment irreversibility

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-1.04	-0.06	0.52	0.75	0.80	-0.08	0.05	-0.07	0.23	0.08	3.0%
t value	-2.96	-1.06	1.73	2.92	4.03	-4.56	0.99	-1.55	3.95	1.40	
p value	0%	29%	8%	0%	0%	0%	32%	12%	0%	16%	
	***		*	***	***	***			***		

B.5. Betas are conditioned on the business cycle factor, financial constraint and investment irreversibility

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-0.89	-0.06	0.57	0.78	0.86	-0.08	0.05	-0.06	0.22	0.10	3.0%

t value	-2.38	-1.05	1.90	3.13	4.43	-4.30	0.95	-1.35	4.00	1.80	
p value	2%	29%	6%	0%	0%	0%	34%	18%	0%	7%	
	**		*	***	***	***			***		

C. Business cycle model

	Accrual	BM	RET23	RET46	RET712	Size	NASDAQ turnover	NYSE-AMEX turnover	NASDAQ	Intercept	Adj. R2
Coefficient	-0.46	-0.17	-0.127	-0.85	-0.46	-0.91	1.37	0.33	2.25	2.51	6.5%
t value	-0.51	-0.74	-1.63	-1.11	-0.73	-7.51	6.03	3.03	6.65	8.83	
p value	61%	46%	10%	27%	46%	0%	0%	0%	0%	0%	
			*			***	***	***	***	***	