Accruals, Net Stock Issues and Value-Glamour Anomalies:

New Evidence on their Relation

Gikas Hardouvelis
Department of Banking and Financial Management
University of Piraeus
80, Karaoli & Dimitriou Street, Piraeus, 18534, Greece
E-mail: hardouvelis@ath.forthent.gr

George Papanastasopoulos[*]
Department of Economics
School of Management and Economics
University of Peloponnese
Tripolis Campus, 22100, Greece
E-mail: papanast@uop.gr

Dimitrios Thomakos
Department of Economics
School of Management and Economics
University of Peloponnese
Tripolis Campus, 22100, Greece
E-mail: thomakos@uop.gr

Tao Wang
Department of Economics
Queens College and the Graduate Center
City University of New York
Flushing, NY 11367, U.S.A.
E-mail: tao.wang@qc.cuny.edu

First Draft: May 28, 2007

[*] Corresponding Author

Electronic copy available at: http://ssrn.com/abstract=1014389

Accruals, Net Stock Issues and Value-Glamour Anomalies: New Evidence on their Relation

Abstract: In this paper we investigate the relation of the anomalies on accruals and net stock issues with the value/glamour anomaly. Our findings reveal, that hedge strategies on retained earnings, total accruals, net operating assets (accrual proxies), cash distributions to equity holders (net stock issues proxy), past sales growth, book to market ratio and free cash flow yield (value/glamour proxies) constitute statistical arbitrage opportunities. We also find that the generated abnormal returns from hedge strategies that combine information on retained earnings (and on other accrual proxies) or cash distributions to equity holders and value/glamour proxies are significantly higher than those from each proxy alone. Thus, if one agrees that the notion of statistical arbitrage is incompatible with market efficiency our evidence suggests that the anomalies on accruals and net stock issues capture distinct forms of mispricing with the value glamour anomaly. Alternatively, our evidence suggests the specification of a broader set of risk factors to existing asset pricing models.

Keywords: accrual anomaly, net stock issues anomaly, value/glamour anomaly, market efficiency

JEL classification: M4

Electronic copy available at: http://ssrn.com/abstract=1014389

1. *Introduction*

Capital market efficiency appears to be a primary topic of research in accounting and finance. Researchers in this area focus on market anomalies that are defined as (abnormal) returns to portfolio strategies constructed on the basis of publicly available information that are not consistent with standard asset pricing models. Some prominent market anomalies that have gained attractive attention in the accounting literature are: the post announcement drift (Bernard and Thomas 1989, 1990), analyst earnings forecast revision effect (Stickel 1991) and more recently the accrual anomaly (Sloan 1996).[1] On the other hand, in the finance literature more attention has been paid to the size effect (Banz 1981), the value/glamour effect (Fama and French 1992, Lakonishok Shleifer and Vishny 1994), momentum (Jegadeesh and Titman 1993) and more recently to the net stock issues anomaly (Ritter 2003).

In this paper, we focus on accruals, net stock issues and value/glamour anomalies. The accrual anomaly was first documented by Sloan (1996) who shows that firms with relatively high (low) levels of accruals experience negative (positive) future abnormal stock returns. On the other hand, researchers have argued that value (glamour) firms are positively (negatively) related with future stock returns, a relation that is known as the value/glamour effect. Finally, a large body of evidence, documents a negative relation between net changes in equity financing (or net stock issues) and future stock returns. Each of these asset pricing regularities has been independently examined in a great extent but their interpretation remains a controversial issue. In particular, some researchers offer behavioral (mispricing) explanations, while others risk based explanations to interpret them.

The work of Desai, Rajgopal and Venkatachalan (2004, “DRV 04” hereafter) is the first systematic attempt to examine the association of market anomalies documented in the finance literature and in the accounting literature In particular, they consider traditional value/glamour proxies such as past sales growth, book to market ratio, earnings yield and cash flow yield and find that the value/glamour effect is distinct from the accrual effect. However, they recognize that the measurement of cash flows in the finance literature is based on the incorrect assumption that depreciation expense is the only significant accrual that needs to be added back to earnings. Thus, they propose a refined definition of cash flow yield where cash flows are measured as earnings plus depreciation minus working capital accruals and find that this measure subsumes the mispricing attributed to all other traditional value/glamour proxies and the mispricing attributed to accruals. Subsequent research by Papanastasopoulos, Thomakos and Wang (2006a, “PTW 06a” hereafter) find that the accrual

[1] Some other studies on accounting examine market anomalies that are based on fundamental analysis (Ou and Penman 1989a and 1989b, Abarbanell and Bushee 1997, Piotroski 2000) and equity valuation models (Frankel and Lee 1998, Dechow, Hutton and Sloan 1999, Lee, Myers and Swaminathan 1999).

anomaly is a subset of a larger anomaly on retained earnings (the sum of working capital accruals, non current operating accruals and retained cash flows) and attributable to investor's limited attention on earnings management. Then, using a comprehensive measure of the net amount of cash related to equity financing (dividends plus stock repurchases minus stock issues), they show that the net stock issues anomaly is largely subsumed by the accounting anomaly on retained earnings and suggest that it arises from investor's limited attention on discretionary decisions by management. In addition, Papanastasopoulos, Thomakos and Wang (2006b, "PTW 06b" hereafter) find that the anomaly on net operating assets (NOA ~ accrual proxy) is unrelated to the anomaly on book to market ratio.

Our work on these three prominent market anomalies extends the existing literature in three aspects. First, we apply the statistical arbitrage test designed by Hogan, Jarrow, Teo and Warachka (2004, "HJTW 04" hereafter) to accruals, net stock issues and value/glamour strategies. This test circumvents the joint hypothesis dilemma of traditional market efficiency tests since its definition is not contingent upon a specific model for market returns (or model of risk adjustment). Thus, in this way we can distinguish between behavioral and risk based explanations for the three anomalies without the specification of any asset pricing model. In particular, we test two implications of statistical arbitrage opportunities for each strategy: one, whether its mean annual incremental profit is positive and two, whether its time-averaged variance decreases over time. To our knowledge, this is the first paper that tests whether accrual and net stock issues strategies constitute statistical arbitrage opportunities.[2] Second, we investigate the relation of the accrual anomaly and the value/glamour anomaly. For this purpose we consider control hedge, non-overlap hedge, joint hedge and zero-investment portfolio strategies (regressions in the spirit of Fama and MacBeth (1973)). Our work differs from "DRV 04" since in our analysis we use more comprehensive proxies of the accrual anomaly and the value/glamour anomaly. Third, using the same methodology we investigate the extent to which the net stock issues anomaly and the value/glamour anomaly overlap with or differ from each other. To our knowledge, this is the first paper examining the relationship between these two anomalies in detail

The key innovation of our research design is that we adopt the most resent advances in the accounting literature to construct comprehensive measures for the three anomalies. Sloan (1996) and "DRV 04" consider, in their analysis, only current operating accruals following Halley's (1985) definition of accruals as change in net working capital less depreciation expense. However, this definition is narrow and results in noisy measures of both accruals and cash flows (since cash flows are typically computed as the difference between earnings and accruals). In this study, we use the level of net operating assets employed in

[2] "HJTW 04" have applied the statistical arbitrage test to momentum and value/glamour strategies, Zhang (2006) to industry NOA strategies and "PTW 06b" to strategies based on NOA components.

Hirshleifer, Hou , Teoh and Zhang (2004, "HHTZ 04" hereafter), total accruals employed in Richardson, Sloan, Soliman and Tuna (2005, "RSTT 05" hereafter) and retained earnings employed in "PTW 06a" as expanded proxies of the accrual anomaly. These measures have been found to reflect more information than Sloan's (1996) measure of accruals about the degree to which the sustainability of current earnings performance provokes excessive investor optimism. In particular, retained earnings will be used in our main tests examining the relation of the accrual anomaly and the value/glamour anomaly, while total accruals and the level of net operating assets will be used in our supplementary tests. Furthermore, for the net stock issues anomaly we apply the clean surplus accounting equation and derive a parsimonious measure that covers net cash flows from all categories of equity financing activities (dividends plus stock repurchases minus stock issues). For value/glamour proxies we consider past sales growth, book to market ratio and cash flow yield. In contrary with prior research, we focus on free cash flows and measure them as earnings minus current and non current operating accruals. Thus, we enhance the definition of the cash flow yield by adjusting earnings for both current and non current operating accruals and construct a new expanded value/glamour proxy labeled as free cash flow yield.

Our findings reveal that the hedge strategies on retained earnings, total accruals, net stock issues, book to market ratio and past sales growth constitute statistical arbitrage opportunities at the 1% level. The incremental profit of strategy on net operating assets is significantly positive, while its time averaged variance is less than zero only at the 10% level, indicating that the strategy may have become riskier over time. Finally, the strategy on the free cash flow yield constitutes statistical arbitrage opportunities at the 5% level.

When we compare the accrual anomaly with the value/glamour anomaly, we find that the strategy on retained earnings generates abnormal returns after controlling for all traditional value/glamour proxies (i.e. past sales growth and book to market ratio) and vice versa. However, the accrual effect is not present across firms with low book to market ratios (glamour firms), while the value/glamour effect is not present across firms with high retained earnings. When we consider the new expanded value/glamour proxy, we find the strategy on retained earnings is profitable across all firms, while the strategy on the free cash flow yield is profitable only across firms with medium levels of retained earnings. Moreover, after controlling for all value/glamour proxies, either in the non-overlap hedge test or in the regression test (zero-investment strategies), retained earnings are related with future returns. However, conditional on retained earnings, only the non- overlap hedge and the zero-investment strategies that are based on free cash flow yield generate significant abnormal returns. Furthermore, the abnormal returns generated from hedge portfolio strategies that combine information on retained earnings (and on other accrual proxies) and value/glamour proxies are significantly higher (without significant additional risk) than those from each proxy in isolation. Additional tests also reveal that retained earnings and free cash flow yield are more composite proxies of the accrual and value/glamour effect, respectively.

Our results on the relationship of the net stock issues effect with the value/glamour effect reveal that the strategy on cash distributions to equity holders generates abnormal returns after controlling for all traditional value/glamour proxies and vice versa. When we consider the expanded value/glamour proxy, it is found that the strategy on net stock issues survives across firms with medium and high levels of free cash flow yield, while the strategy on free cash yield survives only across firms with medium levels of net stock issues. We also find that after controlling for all value/glamour proxies, in the non-overlap hedge test, cash distributions to equity holders are related with future returns. On the other hand, conditional on the net stock issues proxy, only the non overlap hedge strategy on free cash flow yield generate significant abnormal returns. However, the results from the regression analysis show that the strategy on cash distributions to equity holders is profitable, after controlling for all value/glamour proxies and vice versa. We also find that the abnormal returns generated from joint hedge portfolio strategies that exploit both anomalies are also significantly higher (without significant additional risk) than those from unconditional strategies.

Our findings have several implications for the existing literature. First, the existence of statistical arbitrage opportunities for accruals, net stock issues and value/glamour strategies is hard to reconcile with the notion of market efficiency. Furthermore, the results suggest that the accrual effect and the value/glamour effect are distinct from each other. As such, they contradict Beaver's (2002) conjecture that the accrual anomaly is the value/glamour phenomenon in disguise. They also suggest that the net stock issues and value/glamour anomalies capture unrelated phenomena. Thus, they are also consistent with prior findings that the anomaly on net stock issues documented in the finance literature may be a manifestation of a larger accounting anomaly on retained earnings. Note, that if one agrees that the notion of statistical arbitrage is incompatible with market efficiency (Jarrow 1988, chapter 19) then our evidence supports existing behavioral (mispricing) explanations for the interpretation of these three prominent asset pricing regularities. Alternatively, our evidence proposes the specification of a broader set of risk factors to existing tailored (empirical) asset pricing models. Finally, our findings indicate that retained earnings and free cash flow yield are more comprehensive proxies of the accrual and value/glamour anomaly, respectively.

The reminder of the paper is organized as follows. The next section briefly reviews the literature on the accruals, net stock issues and value/glamour anomalies. Section 3 provides a detailed description of our research design. In section 4 we present data, sample formation, variables measurement while in section 5 we provide our empirical results. Section 6 summarizes and concludes the paper.

2. *Literature Review*

One of the most notable contributions in capital markets based accounting research is the finding of the differential persistence and apparent mispricing of the accrual and cash flow components of earnings in Sloan (1996). Sloan shows that accruals are less persistent than cash flows and that investors fixate on earnings failing to correctly distinguish between the different properties. In particular, they overestimate (underestimate) the lower (higher) persistence of accruals (cash flows) when forming future earnings expectations. Consequently, this leads to an "accrual anomaly" where firms with relatively high (low) levels of accruals experience negative (positive) future abnormal stock returns that are concentrated around future earnings announcements. He concludes that investors do not fully comprehend the greater subjectivity involved in the estimation of accruals, causing them to make flawed decisions.

Subsequent research considers broader definitions of accruals and cash flows and provides a variety of interpretations to Sloan's (1996) findings. These studies can be divided in two broad categories on the basis of the approach they adopt. The first set of studies, builds on Sloan's (1996) subjectivity conjecture. Variants of this explanation are embraced in Xie (2001), De Fond and Park (2001), Kothari (2001), Beneish and Vargus (2002), Thomas and Zhang (2002), Dechow and Dichev (2002). On the other hand, the second set of studies builds Fairfiled, Whisenant and Yohn (2003) ("FWY 03", hereafter) conjecture that the accrual anomaly is a special case of a more a general growth (in net operating assets) anomaly that arises from investor's limited attention on diminishing marginal returns to increased investment and/or conservative accounting. Variants of this explanation are embraced are embraced in Cooper, Gulen and Schill (2005), Titman, Wei and Xie (2004) and Anderson, Garcia-Feijoo (2006). In follow up research, Chan, Chan, Jegadeesh and Lakonishok (2006) ("CCJL 06", hereafter) argue that both explanations contribute in the mispricing of accruals. On the other hand, Zach (2005), Ng (2005), Khan (2006) focus on economic variables associated with firm growth and provide risk based explanations to interpret the accrual anomaly. In particular, Zach (2005) argues that the abnormal returns generated by the hedge strategies on accruals are attributable to various corporate events such as mergers and divestitures, Ng (2005) a compensation for default risk and Khan (2006) subsumed by a four factor model motivated from ICAPM.

While in all the above mentioned studies, researchers attempt only to interpret Sloan's (1996) findings, in other studies they have also attempt to construct more comprehensive proxies of the accrual effect. In particular, "HHTZ 04" document that investors view the level of net operating assets much too positively than current operating accruals in forecasting future profitability. "HHTZ 04" argue also that since a high level of net operating assets can reflect earnings management or adverse information about firm's business conditions (growth), their interpretation for the sustainability effect accommodates but does not require earnings management. Then, "RSTT 05" extend the definition of accruals employed in Sloan (1996) to include non current operating accruals, show that this extended measure of accruals (growth in net operating assets) is associated with even greater mispricing and adopt the subjectivity conjecture to interpret it. In follow up research, "PTW 06a" find that the accrual anomaly is a subset of a larger anomaly on retained earnings (the sum of current operating accruals, non current operating accruals and retained cash flows) and attributable to investor's limited attention on earnings management.[3]

Graham and Dodd (1934) observe that value (glamour) firms are positively (negatively) related with future stock returns, a relation that is known as the value/glamour effect. Value firms are those that have weak past performance and are expected to perform weakly in the future, while glamour firms are those that have strong past performance and are expected to perform strongly in the future. That is, value (glamour) firms are characterized by low (high) past growth in sales, earnings, cash flows and high (low) ratios of fundamentals to price such as book to market ratio, earnings yield, cash flow yield and dividend yield. In recent years, the value/glamour effect has attracted academic attention as well. In particular, Basu (1977), Jaffe, Keim and Westerfield (1989), Chan, Hamao and Lakonishok (1991, "CHL 91", hereafter) show that firms with high earnings yield outperform those with low earnings yield. On the other hand, Rosenberg, Reid and Lanstein (1985) and Fama and French (1992) find that firms with high book to market ratio earn higher future returns than firms with low high book to market ratio. Further work by "CHL 91" shows a positive association between cash flow yield and future stock returns.

While there is agreement on the existence of the value/glamour effect, its interpretation remains a controversial issue on the literature. One set of researchers, follow Lakonishok, Shleifer and Vishny (1994, "LSV 94" hereafter) and adopt a behavioral explanation for the anomaly. In particular, "LSV 94" argue that investors extrapolate the poor (strong) past growth rates of value (glamour) firms to form pessimistic (optimistic) expectations about their future growth rates.[4] As growth rates mean-revert in the future, investors are negatively (positively) surprised by the performance of glamour (value) firms. Consistent with this explanation, La Porta, Lakonsihik, Shleifer and Vishny (1997), and Skinner and Sloan (2002) show that the positive (negative) abnormal stock returns of value

[3] Recently, Richardson, Sloan, Soliman and Tuna (2006, "RSTT 06" hereafter) show that both earnings management and growth contribute in the lower persistence of total accruals, while "PTW 06b" show that both factors contribute to the mispricing of the level of net operating assets.

[4] This argument is consistent with evidence in psychology that individuals extrapolate past trends from short histories to far into the future (see the discussion in Shleifer, 2000).

(glamour) firms are concentrated around future earnings announcements and, hence, support this behavioral explanation. The second set of researchers, adopt the risk- based explanation offered by Fama and French (1992, 1993, 1996) and argue that value stock are fundamental riskier and their higher average returns are simply compensation for this risk. Recently, Campbell and Vuolteenaho (2004) argue that the higher average returns of firms with high book to market ratios relative to firms with low book to market rations can be explained by their two beta model motivated by the ICAPM.[5] Consistent with this risk-based explanation, "HJTW 04" show that several hedge strategies on earnings yield do not survive their statistical arbitrage test that circumvents the joint hypothesis dilemma of traditional market efficiency tests since its definition is not contingent upon a specific model of market returns. However, they also find that six out of nine value/glamour strategies based on past sales growth, book to market ratio and cash flow yield constitute statistical arbitrage opportunities and, hence, support the behavioral explanation offered by "LSV 04" for them.

The net stock issues anomaly refers to the negative relation between net changes in equity financing and future stock returns. Future returns are high after stock repurchases (Ikenberry, Lakonishiok, and Vermaelen 1995) and low after stock issues (Loughran and Ritter 1995). In addition, Daniel and Titman (2005) and Pontiff and Woodgate (2006) show that there is a negative relation between net stock issues and equity returns. [6] Ritter (2003), in a recent review of this literature hypothesizes that this relation arises because firms issue new securities when they are temporarily overvalued and repurchase securities when they are temporarily undervalued by the capital markets. Baker and Wurgler (2004a) find that firms initiate dividends when the shares of existing payers are trading at a premium to those of non payers, and dividends are omitted when payers are at a discount. Recently, "PTW 06a" provide a new behavioural explanation for the net stock issues anomaly by examining its relation with the accrual (retained earnings) anomaly. In particular, using a comprehensive measure of the net amount of cash related to equity financing activities (dividends plus stock repurchases minus stock issues), they show that the net stock issues anomaly is largely subsumed by the accounting anomaly on retained earnings and suggest that it arises from investor's limited attention on discretionary decisions by management. On the other hand, Eckbo, Masulis and Norli (2000) and Eckbo and Norli (2005) argue that issuing firms are viewed as less risky by investors and hence are priced to yield lower expected returns.

Each of these asset pricing regularities has been independently examined in a great extent. The work "DRV 04" is the first systematic attempt to examine the association of

[5] The two risk factors (betas) in their model are news about future expected dividends on the market portfolio and news about future expected returns on the market portfolio.
[6] Fama and French (2006) have an application on the net stock issues anomaly.

market anomalies documented in the finance literature and in the accounting literature.[7] In particular, they consider traditional value/glamour proxies such as past sales growth, book to market ratio, earnings yield and cash flow yield and find that the value/glamour effect is distinct from the accrual effect. However, they recognize that the measurement of cash flows in the finance literature is based on the incorrect assumption that depreciation is the only significant accrual that needs to be added back to earnings. Thus, they propose a refined definition of cash flow yield where cash flows are measured as earnings plus depreciation minus working capital accruals and find that this measure subsumes the mispricing attributed to all other traditional value/glamour proxies and the mispricing attributed to accruals. They, conclude that if one interprets the refined definition of cash flow yield as an expanded value/glamour proxy then their evidence support's Beaver (2002) conjecture that the accrual anomaly is the value/glamour phenomenon in disguise. Alternatively, the refined definition of cash flow yield can be viewed as a comprehensive measure that subsumes the value/glamour anomaly and the accrual anomaly.

3. Research Design

In this paper, we focus on the accrual anomaly, the net stock issues anomaly and the value/glamour anomaly. The key innovation of our research design is that we adopt the most resent advances in the accounting literature to construct comprehensive measures for the three anomalies. Sloan (1996) considers in his seminal paper only current operating accruals following Halley's (1985) definition of accruals as change in net working capital less depreciation expense. [8] Hirshleifer, Hou , Teoh and Zhang (2004, "HHTZ 04" hereafter) document that investors view the level of net operating assets (NOA) much too positively than accruals in forecasting future profitability. Net operating assets are equal to the sum of net working capital assets (NWCA) and net non current operating assets (NNCOA):

$$\mathrm{NOA}_t = \mathrm{NWCA}_t + NNCOA_t \tag{1}$$

However, Halley's (1985) definition of accruals is narrow since it ignores accruals relating to non-current net operating assets (e.g. capitalized software development costs, capitalized expenditures, long term receivables) and only incorporates the reversal of a subset of non current operating accruals through subtraction of depreciation expense. On the other

[7] Some other researchers have focused on the relation between the accrual anomaly and other accounting anomalies. In particular, Collins and Hribar (2002) document that the post announcement drift and the accrual anomaly represent distinct anomalies that in combination reveal more extreme market mispricing, while Barth and Hutton (2004) arrive at similar conclusions for the analyst earnings forecast revision anomaly.

[8] This definition is closely related with the definition of operating accruals used in the FASB's Statement of Financial Accounting Standard Number 95 "Statement of Cash Flows'

hand, ignoring such accruals results also in a noisy measure of cash flows since cash flows are typically computed as the difference between earnings and accruals. In follow up research, "RSTT 05" have extended the definition of accruals to include non current operating accruals and show that this extended measure of total accruals is associated with even greater mispricing. In particular, current operating accruals (CACC) are defined as growth in net current operating assets, non current operating accruals (NCACC) as growth in net non current operating assets and total accruals (TACC) as growth in net operating assets:

$$\Delta \mathrm{NOA}_t = \Delta \mathrm{NWCA}_t + \Delta NNCOA_t \Leftrightarrow TACC_t = CACC_t + NCACC_t \quad (2)$$

Furthermore, "PTW 06a"demonstrate that retained earnings is a more comprehensive measure of investor overestimation about the sustainability of current earnings performance that captures information beyond that contained in total accruals. Retained earnings (RE) are equal to the sum of current operating accruals (CACC), non current operating accruals (NCACC) and retained cash flows that are defined as growth in cash holdings (ΔC):

$$RE_t = CACC_t + NCACC_t + \Delta C_t \quad (3)$$

Thus, in our paper we use the level net operating assets, total accruals and retained earnings as more comprehensive measures of accrual anomaly. In particular, retained earnings will be used in our main tests examining the relation of the accrual anomaly and the value/glamour anomaly, while total accruals and the level of net operating assets will be used in our supplementary tests. Note that, "DRV 04" have used Sloan (1996) measure of accruals in examining the relation between the accrual anomaly and the value/glamour anomaly. Furthermore, for the net stock issues anomaly we follow "PTW 06a" and use a parsimonious measure that covers net cash flows from all categories of equity financing activities (dividends plus stock repurchases minus stock issues). In particular, this measure is labeled as cash distributions to equity holders (DIST_E) and defined through the clean surplus equation as the difference between earnings (NI) and growth in the book value of total equity (ΔBV):

$$DIST\_E_t = NI_t - \Delta BV_t \quad (4)$$

For the value/glamour effect we consider past sales growth (SG) as a measure of past performance and book to market ratio (BV/MV) and cash flow yield as a measure of expected performance. However, a crucial point on the use of cash flow yield is the measurement of cash flows. In the finance literature, cash flows are measured as earnings plus depreciation, under the assumption the depreciation is the only significant accrual that needs to be added back to earnings. "DRV 04" focus on operating cash flows and refine the definition of the cash flow yield by adjusting for both working capital accruals and depreciation. However, this measure of cash flows is noisy since it incorporates accruals relating to investment activity. For example, using this measure, cash flows from operations will not be adjusted for long term receivables or capitalized expenditures. Thus, in our paper we focus on free cash flows that are defined as earnings minus total accruals (in other words, free cash flows are equal to net cash flows from operations plus net cash flows from investments).

$$FCF_t = NI_t - TACC_t \quad (5)$$

Thus, we refine the definition of the cash flows by adjusting earnings for both current and non current operating accruals and construct a new expanded value/glamour proxy labeled as free cash flow yield (FCF/MV). Note that, this refined definition of the free cash flow yield is consistent with "LSV 94" interpretation of the fundamentals-to-price ratios as value/glamour proxies.[9]

We organize our work along three dimensions. First, we apply the statistical arbitrage test designed by "HJTW 04" to accrual, net stock issues and value/glamour strategies to get a deeper understanding of their underlying sources. Second, we examine the relation of the accrual anomaly and the value/glamour anomaly by considering control hedge, non-overlap hedge, joint hedge strategies and regressions (construction of zero investment portfolios) in the spirit of Fama and MacBeth (1973). Third, we use the same methodology to investigate the extent to which the net stock issues anomaly and the value/glamour anomaly overlap with or differ from each other.

4. *Data, Sample Formation and Variable Measurement.*

Our empirical tests are conducted using data financial statement data from the Compustat annual database and monthly stock return data from CRSP monthly files. The CRSP file provides data on NYSE and AMEX firms from 1926, while the Compustat database provides data on a similar population from 1950. However, we eliminate pre-1962 observations since the Compustat data prior 1962 suffers from survivorship bias (Fama and French, 1992; Sloan, 1996) and therefore, our sample covers all firm-year with available data on Compustat and CRSP for the period 1962-2003. Moreover, we exclude all firm year observations with SIC codes in the range 6000-6999 (financial companies) because the discrimination between operating and financing activities is not clear for these firms. Furthermore, we require as in Vuolteenaho (2002) all firms to have a December fiscal year end, in order to align accounting variables across firms and obtain tradable investment strategies for our subsequent portfolio assignments. Finally, we eliminate firm year observations with insufficient data on Compustat to compute the primary financial statement variables used in our tests.[10] These criteria yield final sample sizes of 150.896 firm year

[9] "LSV 94" in p. 1541 argue: "These value strategies call for buying stocks that have low prices relative to earnings, dividends, historical prices, book assets, or other measures of value.

[10] Specifically, we require availability of Compustat data items 1, 4, 5, 6 and 181 in both the current and previous year and data item 18 in the current year in order to keep a firm-year in the sample. If data

observations with non missing financial statement and stock return data.

Earnings are defined as one-year ahead annual net income (Compustat data item 18). Moreover, we use the indirect method (balance sheet) method to measure the primary financial statement variables as follows:

$NWCA_t =$ (item 4 – item 1) – (item 5 – item 34)

$NNCOA_t =$ (item 6 – item 4) – (item 181 – item 5 – item 9)

$NOA_t = NWCA_t + NNCOA_t$ [11]

$CACC_t = \Delta$ [(item 4 – item 1) – (item 5 – item 34)]

$NCACC_t = \Delta$ [(item 6 – item 4) – (item 181 – item 5 – item 9)]

$TACC_t = CACC_t + NCACC_t$

$\Delta C_t = \Delta$ (item 1)

$\Delta BV_t = \Delta$ (item 6 – item 181)

Then, our proxies for the accrual anomaly and the net stock issues anomaly are measured through the following expressions:

$NOA_t = NWCA_t + NNCOA_{t_t}$

$TACC_t = CACC_t + NCACC_t$

$RE_t = CACC_t + NCACC_t + \Delta C_t$

$DIST\_E_t = NI_t - \Delta BV_t$

Similar to prior studies, the level of net operating (NOA) is scaled by beginning total assets, while retained earnings (RE), total accruals (TACC) and cash distributions to equity holders (DIST_E) are deflated by contemporaneous average total assets.

For our proxies for the value/glamour effect we measure past sales growth (SG) as the average of annual growth in sales (item 12) over the three previous years[12] and the book to market ratio (BV/MV) as ratio of the fiscal year end book value of equity (item 6 – item 181) to the market value of equity. Market value of equity is measured at the beginning of the portfolio formation month. Note that we require at least a four-month gap between the portfolio formation month and the fiscal year end to ensure that investors have financial

items 9, 34, are missing, we set them equal to zero rather than eliminating the observation. The results are qualitatively similar if we instead eliminate these observations.

[11] The definition of NOA differs from "HTTZ 04" in that it uses directly total liabilities for the calculation of operating liabilities.

[12] In unreported tests we use "LSV 94" definition of past sales growth (SG) as the average of annual growth in sales over the five previous years and find qualitatively similar results.

statement data prior to forming portfolios.[13] Consistent with previous research, we consider firms only with positive book value of equity since negative book to market ratios do not lead to intuitive interpretations in terms of the value/glamour effect.[14] Our refined free cash flow yield (FCF/MV) is equal to the ratio of free cash flows to the market value of equity where free cash flows are measured as the difference between earnings and total accruals.

The annual one-year ahead raw stock returns RET are measured using compounded 12-month buy-hold returns inclusive of dividends and other distributions from the CRSP monthly files. Then, size-adjusted returns $ARET$ are calculated by deducting the value weighted average return for all firms in the same size-matched decile, where size is measured as the market capitalization at the beginning of the return cumulation period. The size portfolios are formed by CRSP and are based on size deciles of NYSE and AMEX firms. If a firm is delisted during our future return window, then the CRSP's delisting return is considered for the calculation of the one-year ahead raw stock return, and any remaining proceeds are re-invested in the CRSP value-weighted market index. This mitigates concerns with potential survivorship biases. If a firm is delisted during our future return window as a result of poor performance (delisting codes 500 and 520-584) and the delisting return is coded as missing by CRSP, then a delisting return of -100% is assumed.[15] Finally, we use rolled-over- one month Treasury- bill return from Ibbotson Associates as the risk free rate.

5. Results

5.1 Descriptive Statistics

Panel A of Table 1 reports univariate statistics for accruals, net stock issues and value/glamour proxies. The mean (median) values of retained earnings, total accruals and net operating assets are 0.068 (0.049), 0.057 (0.043) and 0.725 (0.722), respectively. These positive mean and median values indicate that firm's net operating assets and financial assets (e.g. cash and short term investments) have grown during our sample period. Note that the positive mean value of accruals documented here differs from the negative value documented by Sloan (1996) and "DRV 04". The key reason for this difference is that Halley's (1985) definition of accruals ignores certain non current operating accruals and considers only depreciation expense. On the other hand, the mean (median) values of cash distributions to

[13] Alford , Jones and Zmijewski (1994) argue that four months after the fiscal year end, all firm's financial statement data are publicly available.
[14] The results are qualitatively similar with inclusion of such firms.
[15] Note that we replicate all results by eliminating these firms from the sample or following Shumway (1997) and assuming delisting return of -30% or assuming a zero delisting return. Our results remain qualitatively similar with respect to these three alternative procedures.

equity holders are 0.03 (0.058), indicating that firms have increased dividend payments and decided shares repurchases during our sample period. Turning, to value glamour proxies, we see that the mean (median) values of past sales growth, book to market ratio and free cash flow yield are 0.887 (0.69), 0.366 (0.11) and 0.081 (0.057), respectively.

In panel B of table 1 we present pair-wise (Pearson) correlations for our variables of interest. We see that retained earnings are positively correlated with total accruals (0.862) and net operating assets (0.415) and negatively correlated with cash distributions to equity holders (-0.561). Similarly, total accruals are also positively correlated with net operating assets (0.459) and negatively correlated with cash distributions to equity holders (-0.423). Moreover, the accrual proxies are not highly correlated with the traditional value/glamour proxies, indicating that the two effects might be distinct. On the other hand, the correlation of free cash flow yield with total accruals (-0.476) is stronger than that with retained earnings (-0.404). Note, that in unreported tests we also find that the correlation of free cash flows with retained earnings, total accruals and cash distributions to equity holders is (-0.610), (-0.745) and (0.735), respectively. Finally, cash distributions to equity holders are not highly correlated with all value/glamour proxies, indicating that the net stock issues effect might be incremental to the value/glamour effect.

Table 2 reports mean values of the accruals, net stock issues and value/glamour proxies of equal-sized decile portfolios formed by sorting firms annually on the magnitude of each proxy. The results for deciles based on the magnitude of retained earnings, reveal an increasing trend in total accruals and net operating assets across deciles. We also see that firms in the lowest decile have lower levels of past sales growth and higher levels of cash distributions to equity holders, book to market ratio and free cash flow yield than firms in the highest decile. Similar evidence is found across deciles based on the magnitude of total accruals and the level of net operating assets. On the other hand, there is a decreasing trend in retained earnings and total accruals across deciles based on the magnitude of cash distributions to equity holders. Furthermore, firms in the lowest decile based on the magnitude of cash distributions to equity holders have lower levels of free cash flow yield and higher levels of net operating assets, past sales growth and book to market ratio than firms in the highest decile. From panel B, we see an increasing trend in retained earnings, total accruals, net operating assets and a decreasing trend in book to market ratio and free cash flow yield across deciles based on the magnitude of past sales growth. It is also found, a negative relation of the accrual effect as measured by retained earnings and total accruals with the value/glamour effect as measured by book to market ratio and free cash flow yield. However, the level of net operating assets increases (decreases) across deciles based on the magnitude of book to market ratio (free cash flow yield). Furthermore, value firms have positive cash distributions to equity holders (e.g. dividend payments and repurchases), while glamour firms have negative cash distributions to equity holders (e.g. stock issues). Note, that only value firms in the lowest decile based on the magnitude of past sales growth have negative cash distributions to equity holders.

5.2 Accruals, Net Stock Issues and, Value/Glamour Strategies

In this section, we investigate raw and abnormal (size-adjusted) returns on hedge trading strategies based on the magnitude of accruals, net stock issues and value/glamour proxies, for our sample period (1965-2002). For this purpose we rank firms annually on each proxy, allocate them into ten equal-sized portfolios (deciles) based on these ranks and then compute their future raw and abnormal returns. In Panel A of table 3 we report the average of the 38 annual raw returns for each portfolio based on these proxies, along with their associated t-statistics. Starting with accrual proxies we see that raw returns to hedge strategies on retained earnings, total accruals and net operating assets are 17.4% (t=5.418), 15.8% (t=5.763) and 14.2% (t=3.793), respectively. The raw return to a hedge strategy on cash distributions to equity holders that explores the net stock issues effect is equal to 9.6% (t=2.953). Turning, to traditional value glamour proxies we find that the hedge raw return on past sales growth is 10.5% (t=4.842), while on the book to market ratio is 13.5% (t=3.528). Furthermore, we find that a hedge portfolio consisting of a long (short) position in firms with high (low) levels of free cash flow yield generates a raw return of 12.8% (t=6.395).

Panel B of table 3 presents the average of the 38 annual abnormal returns for each portfolio based on the magnitude of accruals, net stock issues and value/glamour proxies. From the first column we see that the abnormal returns to the strategy on retained earnings range from 7.8% (t=3.285) for the lowest portfolio to -7%% (t=-5.044) for the highest portfolio. The hedge return to the strategy is 14.8 % (t=5.471) and positive in 33 out 38 years. On the other hand, the abnormal returns to hedge strategies on total accruals and net operating assets are 13.6 % (t=5.769) and 12.7% (t=3.522), respectively. Note that the strategy on total accruals is found to be profitable in 30 out of 38 years, while on net operating assets in 31 out of 38 years. We also find that a hedge portfolio consisting of a long (short) position in firms with high (low) levels of cash distributions to equity holders generates an abnormal return of 10.2% (t=3.474) and is profitable in 29 out of 38 years. Turning to value/glamour proxies, we see that the abnormal returns to hedge strategies on past sales growth, book to market ratio and free cash flow yield are 7.8% (t=4.177), 9.4% (t=3.019) and 11.8% (t=5.901), respectively. The incidence of losses for the strategy on past sales growth and free cash flow yield is 13.1% (5 out 38 years), while for the strategy on book to market ratio is 34.2% (13 out of 38 years).

5.3 Statistical Arbitrage Tests

In this section, we attempt to distinguish between behavioral (mispricing) and risk based explanations for accruals, net stock issues and value/glamour anomalies. Bernard, Thomas and Whalen (1997) argue that mispricing is indicated if abnormal returns on zero investment portfolios are positive, period by period. On the other hand, they posit if abnormal returns reflect compensation for risk, it will cause them to be volatile and negative in particular periods. Our results from the previous section reveal that the hedge trading strategies on accrual, net stock issues and value/glamour proxies are profitable in the great majority of years, examined. However, an immediate question in any debate over mispricing is whether the model of market returns (or model of risk adjustment) with respect to which mispricing is documented is valid. Fama (1970) was among the first to observe that tests of market efficiency are joint tests of mispricing and the model of market returns. Thus, the abnormal returns from trading strategies don't necessarily imply the rejection of market efficiency, since they could be due to mismeasured risk if the model of market returns is invalid. In order to avoid this joint hypothesis dilemma of traditional market efficiency tests, we apply the statistical arbitrage test that is designed by "HJTW 04" and defined without reference to any a specific model for market returns, to accrual, net stock issues and value/glamour strategies. [16]

By definition a trading strategy that constitutes statistical arbitrage opportunities must have a zero initial cost (self financing), positive expected discounted profits, a probability of a loss converging to zero and a time-averaged variance converging to zero if the probability of a loss does not become zero in finite time. In economics terms, the last condition associated with the time-averaged variance implies that a statistical arbitrage opportunity eventually produces riskless incremental profit, with an associated "Sharpe" ratio increasing monotonically through time. Note, that the concept of statistical arbitrage opportunity is similar to the limiting arbitrage opportunity used to construct Ross' APT (1976). The difference between the two concepts is that a statistical arbitrage is a limiting condition across time, while Ross' APT is a cross-sectional limit at a point in time. Therefore, just as Ross' APT is appropriate in an economy with a "large" number of assets, "HJTW 04" methodology is appropriate for "long" time horizons. Finally, the definition of statistical arbitrage is not contingent upon a specific asset pricing model and therefore, its existence is inconsistent with market equilibrium, and by inference, with market efficiency.

The zero initial cost (self financing) condition in these tests is enforced by investing (borrowing) trading profits (losses) generated by each trading strategy at the risk free rate.

[16] Cochrane and Saa-Requejo (2000) , Bernardo and Ledoit (2000) and Carr, Geman and Madan (2001) have also conducted similar tests without specifying a particular model of market returns.

Specifically, time series of annual hedge (raw) returns $RET(t_i)$ are first generated from accruals, net stock issues and value/glamour strategies. Then, the trading profits $V(t_i)$ of each trading strategy accumulate at the risk free rate $r(t_i)$ to yield cumulative trading profits (with $V(t_0)=0$):

$$V(t_i) = RET(t_i) + e^{r(t_{i-1})} \cdot V(t_{i-1}) \tag{6}$$

This cumulative trading profit is then discounted each period by $e^{\sum_{i=1}^{n} \Sigma r(t_i)}$ to construct discounted cumulative trading profits $v(t_i)$ for each trading strategy. Let $\Delta v_i = v(t_i) - v(t_{i-1})$, denote the increments of the discounted cumulative profits with mean μ, growth rate of mean θ, standard deviation σ and growth rate of standard deviation λ. Assume also that the increments of the discounted cumulative profits Δv_i evolve according to the following stochastic process:

$$\Delta v_i = \mu \cdot i^{\theta} + \sigma \cdot i^{\lambda} \cdot z_i \tag{7}$$

where i=1,2,…..n, z_i are *i.i.d* $N(0,1)$ random variables with $z_0 = 0$, $v(t_0)$ and Δv_0 are equal to zero. Under the above assumed stochastic process, the discounted cumulative profits v_t are distributed as

$$v(t_n) = \sum_{i=1}^{n} \Delta v_i \sim N\left(\mu \sum_{i=1}^{n} i^{\theta}, \sigma^2 \sum_{i=1}^{n} i^{2\lambda}\right) \tag{8}$$

and have the following log likelihood function.

$$\log L\left(\mu, \sigma^2, \theta, \lambda \middle| \Delta v\right) = -\frac{1}{2}\sum_{i=1}^{n} \log\left(\sigma^2 i^{2\lambda}\right) - \frac{1}{2\sigma^2}\sum_{i=1}^{n} \frac{1}{i^{2\lambda}}\left(\Delta v_i - \mu \cdot i^{\theta}\right)^2 \tag{9}$$

The parameters μ, θ, σ, λ can be estimated through the maximum likelihood estimation method and the associated score equations are provided in the appendix. [17] Then, assuming that $\theta = 0$, one can conduct constraint mean tests of statistical arbitrage. In particular, under these tests a trading strategy generates statistical arbitrage with $1-\alpha$ percent confidence if the following conditions are satisfied[18]:

H1: $\mu > 0$

H2: $\lambda < 0$

---

[17] It is well known that the maximum likelihood estimators are consistent and asymptotically efficient (they achieve Cramer-Rao lower bound).

[18] See in the appendix the appropriate conditions for statistical arbitrage under the unconstraint mean tests and in "HJTW 04"for further details on the differences between the constraint and unconstraint tests of statistical arbitrage.

The first hypothesis tests whether the mean annual incremental profit of a trading strategy is positive (second condition for statistical arbitrage) and the second, whether its time-averaged variance decreases over time (fourth condition of statistical arbitrage). Thus, a single t-test on incremental trading profits is not a valid test for statistical arbitrage since it focuses only on the second condition but ignores the fourth condition. The two parameters are tested individually with the Bonferroni inequality accounting for the combined nature of the hypothesis test. The Bonferroni inequality stipulates that the sum of the p-values from the individual tests becomes the upper bound for the type I error of the statistical arbitrage tests. Note, that standards errors for the above parameters may be extracted from the Hessian matrix to produce the required corresponding p-values.[19]

In table 5 we report the results from statistical arbitrage tests on various hedge portfolio strategies that explore the accrual, net stock issues and value/glamour effects. In the first column we provide t-statistics of the mean annual discounted incremental profits for each trading strategy for comparative purposes. Starting with the accrual effect we see that the strategies on retained earnings and total accruals constitute statistical arbitrage opportunities at the 1% level. In particular, the mean annual discounted incremental profit (μ) for the strategy on retained earnings is equal to 4.2% (p=0.000), while for the strategy on total accruals is equal to 3.9% (p=0.000) with estimated growth rates of standard deviation (λ) equal to -0.512 (p=0.000) and -0.509 (p=0.000), respectively. On the other hand, the mean incremental profit of the strategy on net operating assets is significantly positive, while its time averaged variance is less than zero only at the 10% level, indicating that the strategy may have become riskier over time. Turning to the net stock issues effect, we see that the strategy on cash distribution to equity holders satisfies the requirements for statistical arbitrage at the 1% level since it has a positive mean profit of 2.3% (p=0.000) and a negative growth rate of standard deviation of -0.651 (p=0.000). Consistent, with "HJTW 04" we find similar evidence for the value/glamour effect as measure by past sales growth and the book to market ratio. Finally, the results on our expanded value/glamour proxy labeled as free cash flow yield indicate that it survives the statistical arbitrage test only at the 5% level. Overall, our findings indicate that the accruals, net stock issues and value/glamour strategies converge to riskless arbitrages with decreasing time averaged variance. Thus, these findings are difficult to reconcile with the notion of market efficiency and provide support on existing mispricing (behavioural) explanations to interpret these prominent asset pricing anomalies.

[19] The authors thank M. Warachka for providing them the Hessian matrix.

5.4 Comparing the Accrual and the Value/Glamour Anomaly

So far, these prominent asset pricing regularities have been examined independently from each other. In the accounting literature, more attention has been paid to the accruals effect, while in the finance literature to the net stock issues and the value/glamour effects. In order to investigate the relation of the value/glamour anomaly with the accrual anomaly and the net stock issues anomaly, we consider control hedge, non-overlap hedge, joint hedge strategies and zero-investment portfolio strategies (regressions in the spirit of Fama and MacBeth (1973)).[20] Recall, that in these tests retained earnings will be used as accrual proxy, cash distributions to equity holders as net stock issues proxy, past sales growth, book to market ratio and free cash flow yield as value/glamour proxies. To implement these two-dimensional strategies, we sort stocks independently into three groups, the bottom 20 percent (Group 1), middle 60 percent (Group 2), and top 20 percent (Group 3) based on these proxies and then focus on their intersections.[21]

In table 5, we report abnormal (size-adjusted) returns for each quintile, along with their associated t-statistics. Consistent with prior findings, the unconditional hedge returns for the strategies on retained earnings and cash distribution to equity holders are 10.7 % (t=5.593) and 8.2% (t=3.457), respectively. Furthermore, the unconditional hedge returns for the strategies on past sales growth, book to market ratio and free cash flow yield are 5.4 % (t=3.945), 7.3% (t=2.919) and 10.2% (t=5.71), respectively.

In this section we focus on the relationship between the accrual anomaly and the value/glamour anomaly. Our analysis starts with control hedge strategies, to assess whether the accrual effect survives after holding the value/glamour effect constant and vice-versa. We also consider non-overlap hedge strategies to address the same question, after eliminating firms in convergent extreme intersections where the two effects have the same prediction. Then, we investigate whether a joint hedge strategy that exploits both anomalies generates abnormal returns in excess of those obtained from each anomaly in isolation.

Finally, we use accrual and value/glamour proxies and run regressions in the spirit of Fama and MacBeth (1973) to explain the cross section of stock returns. In particular, zero-investment portfolios are constructed each year by sorting firms independently into nine deciles (0,9) based on accrual and value/glamour proxies and dividing the decile number by 9 so that each firm-year observation related to these proxies takes a value ranging between 0 and 1. Then, each year we estimate separate OLS regressions of abnormal (size-adjusted)

[20] Other studies in the accounting and the finance literature have also used this approach to address similar questions.
[21] Using quintile analysis leads to lower standard errors in t-statistics for hedge returns across two-dimensional strategies than decile analysis. This approach has been also used by other studies in the accounting and the finance literature. However, the results are qualitatively similar with decile analysis.

returns on these proxies[22] and report the time series averages of the resulting parameter coefficients.[23] These coefficients can be interpreted as the abnormal return to a zero-investment strategy that takes a long (short) position on firms with high (low) levels of the respective accrual and value/glamour proxy. The major advantages of regression analysis are the simplicity associated with their interpretation and that multiple regression slopes provide direct estimates of marginal effects. However, this approach imposes a linear structure on the relation between abnormal returns and the proxy under investigation, even though abnormal returns across different cells indicate that the relation may be non-linear.

Panel A of Table 6 reports the abnormal returns for each combination derived from the intersection of quintiles based on the magnitude of retained earnings (RE) and past sales growth (SG), along with their associated t-statistics. We see, that the generated abnormal returns from the strategy on retained earnings are 11.1% (t=3.089), 9.4% (t=4.75) and 7% (t=2.972) across firms with low, medium and high levels of past sales growth**,** respectively**.** Thus, the strategy on retained earnings is profitable, after controlling for past sales growth. On the other hand, the strategy on past sales growth generates significant abnormal returns of 6.3% (t=3.145) only for firms with low levels of retained earnings. This finding, suggest that value/glamour effect as measured by sales growth is not present across firms with high levels of retained earnings and raises interesting questions on "FWY 03" growth conjecture about the source of the accrual anomaly. Taken together that the accrual strategies constitute statistical arbitrage opportunities, our evidence suggest that the mispricing of accruals is more likely to arise from investor's limited attention on earnings management. Note that in contrary with prior research, our analysis is not based on a model to decompose accruals into their discretionary and non discretionary portions.[24] Moreover, when we combine the two effects into a joint hedge strategy, we find that the generated abnormal return is equal to 13.3% (t=6.042) and significantly higher than those obtained from the independent strategies on retained earnings and past sales growth. Figure 1 plots the annual portfolio abnormal returns generated from the joint hedge strategy and the unconditional hedge strategies on retained earnings and past sales growth. The abnormal returns earned by the strategies on retained earnings and past sales growth are positive in 31 of 38 years, while by the joint strategy in 34 of 38 years.

---

[22] We also use size (natural logarithm of market capitalization) as a control variable in these regressions, since we recognize that size-adjusted returns may not fully control for the size effect.

[23] The reported t-statistics are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions

[24] The method of decomposing accruals into their discretionary and non discretionary portions is often used in the accounting literature to distinguish between earnings management and growth hypotheses in assessing the source of the accrual anomaly (see for example Xie, 2001, "CCJL 06", "RSST 06", "PTW 06a" and "PTW 06b"). However, it is a controversial issue since any misspecification in the decomposition introduces measurement errors in each estimated portion (see, Dechow, Sloan and Sweeney, 1995, Guay, Kothari and Watts, 1996 and Kothari, Leone and Wasley 2005).

The higher abnormal return to the joint strategy is not conclusive evidence that the effects are completely distinct from each other. In particular, the non-overlap hedge and the regression tests can enhance our understanding on the relation of the two effects. The abnormal return to a non-overlap hedge strategy on retained earnings, without considering firms in convergent extreme intersections where the two effects have the same prediction (RE(1),SG(1) & RE(3),SG(3)), is positive (8.1%) and statistically significant (t=4.138), while on past sales growth is not statistically significant. This finding indicates that retained earnings dominate past sales growth in predicting future returns. From panel E of table 6 that reports regression results, we also see that the abnormal return to a zero-investment strategy on retained earnings is 12.4% (t=-5.961), while on past sales growth is 5.7% (t=-3.471). However, when the two proxies are considered together in the regression, the abnormal return to retained earnings is 11.6% (t=-5.39), while to past sales growth is not statistically significant. Overall, our findings suggest that the two anomalies are not completely distinct and to some degree they capture common information. They also indicate that to the extent that the two anomalies are not distinct, the abnormal returns to the strategy on past sales growth are attributable to retained earnings.

In table 7, we report results on the relation of the anomaly on retained earnings and the book to market effect. From panel A, we see, that the generated abnormal returns from the strategy on retained earnings are 2.4% (t=1.141), 9.6% (t=4.863) and 15.3% (t=4.31) across low, medium and high quintiles based on the magnitude of the book to market ratio**,** respectively**.** Thus, the accrual effect is not present across glamour firms. On the other hand, the value/glamour effect as measured by the book to market ratio is not present across firms with medium and high levels of retained earnings, suggesting again a more prominent role for Sloan’s (1996) subjectivity conjecture in interpreting the accrual anomaly. In particular, the strategy on the book to market ratio generates significant abnormal returns of about 14.6% (t=4.173) only across firms with low levels of retained earnings. Note also, that information in the book to market ratio can be combined to refine the strategy on retained earnings and vice versa. In particular, the strategy on retained earnings can be refined by excluding glamour firms from the low-retained earnings-portfolio (RE(1)), while the value/glamour strategy can be refined by excluding firms with high retained earnings from the value (BV/MV(3)) portfolio. Moreover, the abnormal return from a hedge portfolio strategy taking a long position in the (RE(1), BV/MV(3) intersection and a short position in the intersection (RE(3), BV/MV(1)) is positive 17.0 % and statistically significant (t=4.549). The difference between the abnormal return obtained from the joint hedge strategy with that from the strategy on retained earnings is 6.3% (t=2.222), while with that from the strategy on the book to market ratio is 9.7% (t=4.34). Thus, the joint hedge strategy that exploit both effects, generate abnormal returns in excess of those based on each effect alone. In figure 2, we plot these annual hedge portfolio abnormal returns generated from the joint strategy and the pure strategies on retained earnings and book to market ratio. The strategy on book to market ratio is profitable in 25 out of 38 years, while the joint strategy in 30 out of 38 years.

Turning to panel C we find that the abnormal return to a non-overlap hedge strategy on retained earnings, after eliminating firms in extreme (RE(1),BV/MV(3) & RE(3),BV/MV(1)), intersections, is positive (7.5%) and statistically significant (t=3.805), while on the book to market ratio is not statistically significant. This finding indicates that the book to market effect is weakened in the presence of retained earnings. From panel E we also see that the abnormal return to a zero-investment strategy on the book to market ratio 7.5% and statistically significant at the 10% level (t=-1.896). However, when both proxies are considered together in the regression, the abnormal return to retained earnings is 11.1% (t=-5.56), while to the book to market is not statistically significant. Overall, our findings suggest that retained earnings and the book to market ratio represent to a large extent different asset pricing regularities and that information in each strategy can be profitably used to refine the other. They also indicate that to the extent that the two anomalies are related to common information, retained earnings subsumes the predictive power of the book to market ratio for future returns. Pulling together, our findings on tables 6 and 7 are consistent with "DRV 04" evidence on the relation of the accrual effect as measured by current operating accruals and the value/glamour effect as measured by past sales growth and the book to market ratio.

Table 8 provide the results on the relation between that the strategy on retained earnings and the strategy on our expanded value/glamour proxy labeled as free cash flow yield. From panel A we see that the strategy on retained earnings is profitable across all firms regardless of their value/glamour status. In particular, it generates abnormal returns of 9.7% (t= 1.974), 5% (t=2.704) and 11.9% (t=2.56) across firms with low, medium and high levels of free cash flow yield**,** respectively. On the other hand, the strategy on free cash flow yield generates significant abnormal returns of about 9.1% (t=4.6) only for firms with medium levels of retained earnings. This is not surprising, since free cash flows are negatively with retained earnings (-0.610). Note also, that glamour firms with low levels of retained earnings and value firms with high levels of retained earnings do not earn significant abnormal returns. Thus, the significance of the generated abnormal returns can be refined by excluding those glamour firms from the strategy on retained earnings and those firms with high retained earnings from the strategy on free cash flow yield.

Moreover, the abnormal return from a hedge portfolio strategy taking a long position in the (RE(1), FCF/MV(3) intersection and a short position in the intersection (RE(3), FCF/MV(1)) is positive 14.4% and statistically significant (t=7.594). The difference between the abnormal return obtained from the joint hedge strategy with that from the strategy on retained earnings is 3.7% (t=3.176), while with that from the strategy on free cash flow yield is 4.2% (t=2.283). Thus, the combination of the two anomalies into a joint hedge strategy generates significantly higher abnormal returns than those obtained by exploiting each anomaly in isolation. A plot of the abnormal returns generated from these hedge portfolio strategies is depicted in figure 3. The incidence of losses for the basic strategy on retained earnings is 18.4% (7 out 38 years), for the basic strategy on free cash yield is 13.1% (5 out of 38 years) and for the joint hedge strategy is 10.5% (4 out of 38 years).

We also find, that after controlling for retained earnings, either in the non-overlap hedge test or in the regression test (zero-investment strategies), our expanded value/glamour proxy is significantly related with future returns. In particular, the abnormal return to a non-overlap hedge strategy on retained earnings is equal to 6% (t=2.733), while on free cash flow yield is equal to 6.2% (t=2.13). Thus, in the absence of firms in convergent cells (RE(1),FCF/MV(3) & RE(3),FCF/MV(1)), where the two anomalies have the same sign, these accrual and value/glamour proxies have both predictive power for future returns. From panel E that reports regression results, we also see that the abnormal return to a zero-investment strategy on free cash flow yield is 14.1% (t=6.263). When the two proxies are both included in the regression, the abnormal return to the zero-investment strategy on retained earnings is 6.1% (t=-2.056), while on free cash flow yield is 11.3% (t=-3.609). Our results, suggest that accrual effect as measured by retained earnings and the value/glamour effect as measured by free cash yield, represent completely unrelated asset pricing anomalies that in combination generate substantially higher abnormal returns. Recall, that "DRV 04" consider, in their analysis, a refined definition of cash flow yield where cash flows are measured as earnings plus depreciation minus current operating accruals and find that this measure subsumes the mispricing attributed other to all other value/glamour proxies and the mispricing attributed to current operating accruals. As such, our evidence in tables 6, 7 and 8 contradicts Beaver's (2002) conjecture that the accrual anomaly is the value/glamour phenomenon in disguise.

5.5 Comparing the Net Stock Issues and the Value/Glamour Anomaly

In this section, we investigate the extent to which the net stock issues anomaly and the value/glamour anomaly overlap with or differ from each other. Table 9 provides results on the association of the anomaly on cash distribution to equity holders and past sales growth. From panel A, we see, that the generated abnormal returns from the strategy on cash distribution to equity holders are 7.4% (t=2.512), 6.8% (t=2.881) and 10.3% (t=3.473) across SG(1)**,** SG(2) and SG(3), groups respectively. Thus, the strategy is profitable across all firms regardless their sales growth. On the other hand, the strategy on past sales growth earns abnormal returns of 6.8% (t=3.155), 2.9% (t=2.025) and 3.9% (t=1.652) across DIST_E(1)**,** DIST_E(2) and DIST_E(3) groups, respectively. This finding implies that the sales growth effect is not present across firms with high levels of cash distributions to equity holders and by definition with low levels of retained earnings. It is also consistent with "PTW 06a" conclusion that the anomaly on net stock issues is a special case of the accrual (retained earnings) anomaly and arises from investor's limited attention on discretionary decisions by management.

We also find that the abnormal return to joint hedge strategy that combines information in cash distributions to equity holders and sales growth is equal to 14.2 % (6.215) and roughly double than those obtained from the independent strategies on these proxies. As depicted in figure 4, a pure strategy on net stock issues is profitable in 31 out of 38 years, while the joint strategy in 33 of 38 years. Turning to panel C we see that abnormal return to a non-overlap hedge strategy on cash distributions to equity holders, without considering firms in convergent cells (DIST_E(3),SG(1) & DIST_E(1),SG(3)), is positive (5.7%) and statistically significant (t=2.095), while on past sales growth is not statistically significant. This finding indicates that the sales growth effect is mitigated in the presence of the net stock issues effect. However, from panel D we see that the abnormal returns to zero-investment strategies on these proxies are both positive and statistically significant. In particular, the abnormal returns for cash distributions to equity holders is 10.6% (t=3.383), while on past sales growth is 4.5% (t=-2.864). Note, that the abnormal return to a pure zero-investment strategy on the net stock issue proxy is 11% (t=3.497). Overall, our findings suggest that the two effects represent unrelated phenomena, although the sales growth effect is weakened in the presence of the net stock issues effect.

Results reported in table 10, reveal that the strategy on cash distributions to equity holders earns significant abnormal returns across all firms regardless their value/glamour status as measured by the book to market ratio and vice versa. Moreover, we see that a hedge portfolio strategy taking a long position in the (DIST_E(3), BV/MV(3) intersection and a short position in the intersection (DIST_E(1), BV/MV(1)) generates an abnormal return of about 20.1% (t=4.698) and from figure 5 that it is profitable in the great majority of years (30 out of 38 years). The difference between the abnormal return obtained from the joint hedge strategy with that from the strategy on cash distributions to equity holders is 11.9% (t=3.74), while with that from the strategy on the book to market ratio is 12.8% (t=4.671).

We also find, that abnormal return to a non-overlap hedge strategy on cash distributions to equity holders, after eliminating firms in convergent cells (DIST_E(1),BV/MV(1) & DIST_E(3),BV/MV(3)), is 5.3% (t=2.368), while on the book to market ratio is 3.7% (t=1.737). Note also, that when both proxies are included in the regressions, the abnormal return to a zero-investment strategy on cash distributions to equity holders is 11.3% (t=3.835), while on the book to market ratio is 7.8% (t=2.038). Thus, our finings indicate that the anomalies on cash distributions to equity holders and the book to market ratio capture are unrelated.

Finally, in table 11 we provide the results on the relation between the net stock issues effect as measured by cash distributions to equity holders and the value/glamour effect as measured by free cash flow yield. We see that the strategy on cash distributions to equity holders generates abnormal returns of 5.7% (t=1.16), 6.2% (t=2.599) and 9.3% (t=2.76), across firms with low, medium and high levels of free cash flow yield**,** respectively**.** Thus, the net stock issues effect is not present across glamour firms. On the other hand, the strategy on free cash flow yield generates significant abnormal returns of about 8.6% (t=6.319) only for firms with medium levels of cash distributions to equity holders. This is not surprising, since free cash flows are positively correlated with cash distributions to equity holders (0.735).

The abnormal return from a hedge strategy that exploits both proxies is equal to 12.9% (t=4.443) and significantly higher than that from each proxy alone. From figure 6, one can see that the incidence of losses for the joint strategy is 15.7% (6 out of 38 years). We also find that the abnormal return to a non-overlap hedge strategy on cash distributions to equity holders is equal to 5.7% (t=2.494), while on free cash flow yield is equal to 7.8% (t=5.933). Thus, after eliminating firms in extreme intersection, where the two anomalies have the same prediction, these proxies have both predictive power for future returns. Our results on panel E, reveal that when both proxies are included in the regression, the abnormal return to a zero-investment strategy on cash distributions to equity holders is 5.7% (t=2.047), while on free cash flow yield is 11.3% (t=7.629). Thus, the results show that the anomaly on cash distributions to equity holders is distinct from the anomaly on free cash flow yield. Overall our findings, suggest that the net stock issues effect and the value/glamour effect represent unrelated market anomalies. Taken also together, that the strategies on accrual, net stock issues and value/glamour proxies constitute statistical arbitrage opportunities, our evidence is most consistent with the explanation associated with earnings management being the driving force in the negative relation of net stock issues and stock returns.

5.6 Additional Tests

In this section, we provide additional evidence on the relation of these three prominent asset pricing regularities. Our analysis starts, with statistical arbitrage tests on joint hedge strategies that combine the value/glamour effect with the accrual effect and the net stock issues effect. Results on table 12 reveal these joint hedge portfolio strategies constitute statistical arbitrage opportunities at the 1% level. Recall also, that in the previous sections we show that joint hedge strategies generate larger and more persistent abnormal returns than the unconditional hedge strategies. Thus, there does not appear to be significant additional risk with these combined strategies in terms of magnitude or frequency of losses and terms of statistical arbitrage.

In table 13 we report results from regression analysis that compare the predictive ability for future returns of free cash flow yield with that of past sales growth, book to market ratio, total accruals and net operating assets. From Panel A, we see that our expanded value/glamour proxy dominates the traditional value/glamour proxies in predicting future returns. In particular, we see that in the presence of free cash flow yield, a zero-investment strategy on past sales growth does not generate significant abnormal returns. Similar evidence is found for the book to market ratio. When all value/glamour proxies are included in the regression, the abnormal return on free cash flow yield is 12.4% (t=5.86), while on past sales growth and book to market ratio are statistically insignificant. The overall picture emerges from panel A, is that free cash flow yield subsumes the abnormal returns attributed to all other traditional value/glamour proxies.

In panel B, we see that the predictive power of past sales growth and book to market ratio for future returns is mitigated in the presence of total accruals. We then consider free cash yield and total accruals together in the regression and find that the abnormal on free cash flow yield is 10.1% (t=2.209), while on total accruals is statistically insignificant. Note, that in table 7 we find that when both retained earnings and free cash flow yield are included in the regression, the abnormal return to the zero-investment strategy on retained earnings is 6.1% (t=-2.056) while on free cash flow yield is 11.3% (t=-3.609). The difference between these findings is consistent with the higher correlation of free cash flows yield with total accruals than that with retained earnings. In Panel C we see that the predictive power of net operating assets for future returns dominates that of sales growth, is unrelated to that of the book to market ratio, but is mitigated in the presence of the free cash flow yield. Note that, additional results provided in the appendix (tables A1 –A6), reveal that total accruals and net operating assets are significantly associated with future returns, after controlling for all value/glamour proxies, and vice versa. Furthermore, a hedge strategy that combines information on each of these accrual and value/glamour proxies generates abnormal returns in excess of those obtained from each proxy in isolation. Overall, the above mentioned findings are consistent with "DRV 04" evidence from zero-investment strategies on current operating accruals, past sales growth, book to market ratio and their expanded value/glamour proxy (operating cash flow yield), but in contrary with their evidence from control hedge, non-overlap hedge and joint hedge strategies on these proxies. They also indicate that retained earnings and free cash flow yield are more comprehensive proxies of the accrual and value/glamour effect, respectively. Finally, they suggest that the accrual anomaly is distinct from the value/glamour anomaly.

6. Conclusions

In this paper, we focus on the accruals, net stock issues and value/glamour anomalies. Building on the most recent advances in the accounting literature we use retained earnings, total accruals and the level of net operating assets as comprehensive measures of the accrual effect. For the net stock issues effect, we apply the clean surplus accounting equation to derive a parsimonious measure that covers all equity financing activities and labeled as cash distributions to equity holders. Past sales growth, book to market ratio and cash flow yield are considered as value/glamour proxies. However, we enhance the definition of the cash flow yield by adjusting earnings for both current and non current operating accruals and construct a new expanded value/glamour proxy labeled as free cash flow yield.

The trading strategies based on the above proxies constitute statistical arbitrage opportunities, a finding that is difficult to reconcile with the notion of market efficiency for any model of market returns. We also find that both the strategies on retained earnings and cash distributions to equity holders generate abnormal returns after controlling for all value/glamour proxies, and vice versa. Note, the value/glamour effect is not found present across firms with high levels of retained earnings and firms with low levels of cash distributions to equity holders. Additional tests also reveal that retained earnings and free cash flow yield are more composite proxies of the accrual and value/glamour effect, respectively.

Furthermore, we show that the abnormal returns generated from hedge strategies that combine information on retained earnings (and on other accrual proxies) or cash distributions to equity holders and value/glamour proxies, are significantly higher than those from each proxy alone. Note that there does not appear to be significant additional risk with the combined strategies in terms of magnitude or frequency of losses and in terms of statistical arbitrage. Thus, our findings suggest that the accrual and the value/glamour anomaly capture distinct asset pricing regularities. As such, they contradict Beaver's (2002) conjecture that the accrual anomaly is the value/glamour phenomenon in disguise. They also suggest that net stock issues and value/glamour anomalies are distinct from each other.

Overall, our findings are open to two plausible interpretations. If one agrees that the notion of statistical arbitrage is inconsistent with market equilibrium and, by inference, with market efficiency, then our evidence suggests that the anomalies on accruals and net stock issues capture distinct forms of market mispricing from the value/glamour anomaly. They also give a prominent role for investor's limited attention on earnings management in interpreting the anomalies on accruals and net stock issues. Alternatively, our evidence proposes a broader specification of existing tailored (empirical) asset pricing models, to control for risk in the cross section of stock returns.

References

Abarbanell, J., Bushee, B. 1997. Fundamental Analysis, future earnings, and stock prices. Journal of Accounting Research, 35, 1-24.

Alford, W., Jones, J., Zmijewski, M.1994. Extensions and violations of the statutory SEC Form 10-K filing requirements. Journal of Accounting & Economics, 17, 229-256.

Anderson, C., Garcia-Feijoo, L. 2006. Empirical evidence on capital investment, growth options, and security returns. Journal of Finance, 61, 171-194.

Baker, M., Wurgler., J.2004a, A catering theory of dividends. Journal of Finance, 59, 271-288.

Banz, W. 1981, The relationship between return and market value of common stocks. Journal of Financial Economics, 9, 3-18.

Basu, S. 1977. Investment performance of common stocks in relation to their price earnings ratios: A test of the efficient market hypothesis. Journal of Finance, 32, 663-682.

Barth., M., Hutton., A.2004. Analyst forecast revisions and the pricing of accruals. Review of Accounting Studies, 9, 59-96.

Beaver., W. 2002. Perspectives in capital market research. The Accounting Review, 77, 453-474.

Beneish, M. D., Vargus, M.E. 2002. Insider trading, earnings quality and accrual mispricing. The Accounting Review, 77, 755-791.

Bernard, V., Thomas, J. 1989. Delayed price response or risk premium? Journal of Accounting and Research, 27, 1-36.

Bernard, V., Thomas, J. 1990. Evidence that stock prices do not fully reflect the implications of current earnings for future earnings. Journal of Accounting and Economics, 13, 305–340

Bernard, V., Thomas, J., Wahlen, J. 1997. Accounting-based stock price anomalies: separating market inefficiencies from risk. Contemporary Accounting Research, 14, 89-136.

Bernardo, A. E., Ledoit, O. 2000. Gain, loss, and asset pricing. Journal of the Political Economy, 108, 144 - 172.

Campbell, J., Vuolteenaho, T. 2004. Bad beta, good beta. American Economic Review, 94, 1249-1275.

Carr, P., Geman, H., Madan, D. 2001. Pricing and hedging in incomplete markets. Journal of Financial Economics, 62, 131 - 167.

Chan, L., Hamao, Y., Lakonishok, J. 1991. Fundamentals and stock returns in Japan. Journal of Finance, 46, 1739-1764.

Chan, K., Chan, L., Jegadeesh, N., Lakonishok, J. 2006. Earnings quality and stock returns. Journal of Business, 79, 1041-1082.

Cochrane, H., Saa-Requejo, J. 2000. Beyond Arbitrage, Good-deal Asset Price Bounds in Incomplete Markets. Journal of the Political Economy, 108, 79-119.

Collins, D., Hribar, P. 2002. Earnings-based and accrual-based market anomalies: one effect or two? Journal of Accounting and Economics, 29, 101-123.

Cooper, M., Gulen, H., Schill, M. 2005. What best explains the cross-section of stock returns? Exploring the asset growth effect. Journal of Finance, forthcoming.

Daniel, K., and S. Titman, 2005. Market reactions to tangible and intangible information. Journal of Finance, forthcoming.

Dechow, P., Hutton, A., Sloan, R. 1999. An empirical assessment of the residual income valuation model. Journal of Accounting & Economics, 26, 1-34.

Dechow, P., Sloan, R., Sweeney, A. 1995. Detecting earnings management. The Accounting Review, 70, 193-226.

Dechow, P., Dichev, I. 2002. The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review, 77, 35-59.

DeFond, M., Park, C. 2001. The reversal of abnormal accruals and the market valuation of earnings surprises. The Accounting Review, 76, 375-404.

Desai, H., Rajgopal, S., Venkatachalam, M. 2004. Value-glamour and accruals mispricing: one anomaly or tow? The Accounting Review, 79, 355-385.

Eckbo, B.E., Norli, O. 2005. Liquidity risk, leverage and long-run IPO returns. Journal of Corporate Finance, 11, 1–35.

Eckbo, B.E., Masulis, R.W., Norli, O. 2000. Seasoned public offerings: resolution of the 'new issues puzzle'. Journal of Financial Economics, 56, 251–291

Fairfield, P., Whisenant, J., Yohn, T. 2003. Accrued earnings and growth: implications for future profitability and market mispricing. The Accounting Review, 78, 353–371.

Fama, E. 1970. Efficient capital markets: A review of theory and empirical work. Journal of Finance, 25, 383-417.

Fama, E., MacBeth, J. 1973. Risk, return, and equilibrium: empirical tests. Journal of Political Economy, 81, 607-636.

Fama, E., French, K. 1992. The cross-section of expected stock returns. Journal of Finance, 47, 427-465.

Fama, E., French, K. 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics, 33, 3–56.

Fama, E., French, K. 1996. Multifactor explanations of asset pricing anomalies. Journal of Finance, 51, 3–56.

Fama, E., French, K. 2006. Dissecting anomalies, CRSP Working Paper No. 610.

Frankel, R., Lee, C. 1998. Accounting valuation, market expectation, and cross-sectional stock returns. Journal of Accounting and Economics, 25, 283-319.

Graham, B. and D. Dodd. 1934. Security Analysis. McGraw Hill, New York.

Guay, W., Kothari, S., Watts, R. 1996. A market-based evaluation of discretionary accrual models. Journal of Accounting Research, 34, 83–115.

Healy, P. 1985. The effect of bonus schemes on accounting decisions. Journal of Accounting and Economics, 7, 85-107.

Hirshleifer, D., Hou, K., Teoh, S., Zhang, Y. 2004. Do investors overvalue firms with bloated balance sheets? Journal of Accounting and Economics, 38, 297-331.

Hogan, S., Jarrow, R., Teo, M., Warachka, M. 2004. Testing market efficiency using statistical arbitrage with applications to momentum and value strategies. Journal of Financial Economics, 73, 525-565.

Jaffe, J., Keim, D., Westerfield, R. 1989. Earnings yields, market values, and stock returns, Journal of Finance, 44, 135-148.

Jarrow, R. 1988. Finance Theory. Prentice-Hall.

Jegadeesh, N., Titman S. 1993. Returns to buying winners and selling losers: Implication for stock market efficiency, Journal of Finance, 48, 65-91.

Ikenberry, D., J. Lakonishok, and T. Vermelean 1995, Market underreaction to open market share repurchases, Journal of Financial Economics, 39, 181-208.

Khan, M. 2006. Are accruals really mispriced? Evidence from tests of an intertemporal capital asset pricing model. MIT working paper.

Kothari, S. 2001. Capital markets research in accounting. Journal of Accounting and Economics, 31, 105-232.

Kothari, S, Leone, A, Wasley, C. 2005. Performance matched discretionary accrual measures. Journal of Accounting and Economics, 39, 163-197.

Lakonishok, J., Shleifer, A., Vishny, R. 1994. Contrarian investment, extrapolation, and risk. Journal of Finance, 49, 1541–1578.

La Porta, R., Lakonishok, J., Shleifer, A., Vishny, R. 1997. Good news for value stocks: Further evidence on market efficiency. Journal of Finance, 52, 1715-1742.

Lee, C., Myers, J., Swaminathan, B. 1999. What is the intrinsic value of the Dow? Journal of Finance, 54, 1693-1741.

Loughran, T. Ritter J., R. 1995, The New issues puzzle, Journal of Finance, 50, 23-51.

Ng, H. 2005. Distress risk information in accruals. University of Pennsylvania working paper.

Ou, J., Penman, S. 1989a. Financial statement analysis and the prediction of stock returns. Journal of Accounting and Economics, 11, 295-329.

Ou, J., Penman, S. 1989b. Accounting measurement, price-earnings ratio, and the information content of security prices. Journal of Accounting Research, 27, 111- 144.

Papanastasopoulos, G., Thomakos, D., Wang, T. 2006a. The implications of retained and distributed earnings for future profitability and market mispricing. University of Peloponnese and City University of New York working paper.

Papanastasopoulos, G., Thomakos, D., Wang, T. 2006b. Information in balance sheets about future stock returns: Evidence from net operating assets. University of Peloponnese and City University of New York working paper.

Piotroski, J. 2000. Value investing: The use of historical financial statement information to separate winners from losers. Journal of Accounting Research, 38, 1-41.

Pontiff, J., Woodgate, A. 2006. Share outstanding and cross sectional returns. Journal of Finance, forthcoming.

Richardson, S., Sloan, R., Soliman, M., Tuna, I. 2005. Accrual reliability, earnings persistence and stock prices. Journal of Accounting and Economics, 39, 437-485.

Richardson, S., Sloan, R., Soliman, M., Tuna, I. 2006. The implications of firm growth and accounting distortions for accruals and profitability. The Accounting Review, 81, 713-743.

Ritter, J. R. 2003. Investment banking and securities issuance. In Constantinides, G., Harris, M., Stulz, R. (Ed.) Handbook of Economics and Finance. North-Holland, Amsterdam.

Rosenberg, B., Reid, K., Lanstein, R. 1985. Persuasive evidence of market inefficiency. Journal of Portfolio Management, 11, 9-16.

Ross, R. 1976. The arbitrage theory of capital asset pricing. Journal of Economic Theory, 13, 341-360.

Shleifer, A. 2000. Inefficient markets, an introduction to behavioral Finance. Oxford University Press, Oxford, UK.

Shumway, T. 1997. The delisting bias in CRSP data. Journal of Finance, 52, 327-340.

Skinner, D., Sloan, R. 2002. Earnings surprises, growth expectations and stock returns or don’t let an earnings torpedo to sink your portfolio. Review of Accounting Studies, 7, 289-312

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

Stickel, S. E. 1991. Common stock returns surrounding earnings forecast revisions. Journal of Accounting Research, 28, 1–42.

Thomas, J., Zhang, H. 2002. Inventory changes and future returns. Review of Accounting Studies, 7, 163-187.

Titman, S., Wei, J., Xie, F. 2004. Capital investments and stock returns. Journal of Financial and Quantitative Analysis, 39, 677-700.

Vuolteenaho, T. 2002. What drives firm-level stock returns? Journal of Finance, 57, 233-264.

Xie, H. 2001. The mispricing of abnormal accruals. The Accounting Review, 76, 357-373.
Zach, Z. 2005. Inside the accrual anomaly, Washington University working paper.
Zhang, Y. 2006. Net operating assets as a predictor of industry stock returns, Chinese University of Hong Kong working paper.

Tables

Table 1: Summary Statistics

Panel A: Univariate Statistics

Parameter	Mean	Median	Std. Dev.	Skewness	Kurtosis
RE	0.068	0.049	0.226	19.64	1817
$TACC$	0.057	0.043	0.206	25.21	2591
NOA	0.725	0.722	0.508	61.17	7830
$DIST\_E$	0.03	0.058	0.223	-23.6	1969
BV/MV	0.887	0.69	0.853	7.879	192.5
SG	0.366	0.11	13.35	209.6	46139
FCF/MV	0.081	0.057	0.818	16.93	1422

Panel B: Correlation Matrix (Pearson)[*]

Parameter	RE	$TACC$	NOA	$DIST\_E$	BV/MV	SG	FCF/MV
RE	**1**	**0.862**	**0.415**	**-0.561**	**-0.121**	**0.009**	**-0.404**
$TACC$	**0.862**	**1**	**0.459**	**-0.423**	**-0.096**	**0.012**	**-0.476**
NOA	**0.415**	**0.459**	**1**	**-0.1**	**0.022**	**0.006**	**-0.192**
$DIST\_E$	**-0.561**	**-0.423**	**-0.1**	**1**	**0.046**	**-0.016**	**0.231**
BV/MV	**-0.121**	**-0.096**	**0.022**	**0.046**	**1**	**-0.007**	**0.153**
SG	**0.009**	**0.012**	**0.006**	**-0.016**	**-0.007**	**1**	**-0.008**
$ARET$	**-0.069**	**-0.057**	**-0.043**	**0.047**	**0.046**	**-0.009**	**0.053**

[*] Notes: Bold numbers indicate significance at less than 5% level.

Table 2: Selected Characteristics for Various Decile Portfolios

Panel A: Selected Characteristics for Accruals & Net Stock Issues Decile Portfolios

Retained Earnings (RE) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	-0.214	-0.051	-0.008	0.018	0.039	0.061	0.088	0.125	0.193	0.444
$TACC$	-0.169	-0.038	-0.003	0.018	0.036	0.055	0.077	0.109	0.165	0.347
NOA	0.499	0.624	0.652	0.671	0.689	0.707	0.729	0.765	0.829	1.191
$DIST\_E$	0.064	0.053	0.063	0.068	0.067	0.068	0.065	0.053	0.019	-0.15
SG	0.416	0.152	0.131	0.143	0.232	0.214	0.214	0.706	0.364	0.722
BV/MV	1.081	1.182	1.087	0.971	0.92	0.853	0.79	0.732	0.677	0.622
FCF/MV	0.615	0.237	0.174	0.129	0.092	0.062	0.024	-0.03	-0.109	-0.39

Total Accruals ($TACC$) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	-0.165	-0.028	0.002	0.025	0.045	0.061	0.085	0.115	0.171	0.385
$TACC$	-0.208	-0.055	-0.015	0.012	0.034	0.056	0.082	0.118	0.179	0.392
NOA	0.487	0.596	0.638	0.665	0.687	0.709	0.733	0.772	0.835	1.235
$DIST\_E$	0.054	0.046	0.053	0.06	0.06	0.062	0.053	0.045	0.019	-0.09
SG	0.35	0.171	0.218	0.194	0.218	0.214	0.239	0.255	0.352	1.084
BV/MV	1.062	1.067	1.029	0.976	0.915	0.882	0.813	0.776	0.727	0.669
FCF/MV	0.715	0.259	0.188	0.135	0.09	0.047	0.003	-0.05	-0.134	-0.45

Net Operating Assets (NOA) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	-0.044	-0.014	0.011	0.02	0.03	0.046	0.06	0.087	0.139	0.361
$TACC$	-0.076	-0.027	0.002	0.013	0.024	0.043	0.058	0.085	0.134	0.341
NOA	0.284	0.504	0.596	0.657	0.705	0.748	0.791	0.842	0.918	1.312
$DIST\_E$	0.0005	0.044	0.057	0.064	0.062	0.061	0.057	0.051	0.034	-0.07
SG	0.487	0.24	0.155	0.621	0.16	0.185	0.226	0.308	0.312	0.603
BV/MV	0.749	0.891	0.896	0.926	0.953	0.956	0.948	0.942	0.887	0.767
FCF/MV	0.356	0.215	0.171	0.163	0.134	0.109	0.075	0.027	-0.057	-0.39

Earnings Distributed to Equity holders ($DIST\_E$) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	0.247	0.085	0.053	0.057	0.054	0.056	0.058	0.052	0.048	-0.011
$TACC$	0.168	0.082	0.056	0.055	0.049	0.052	0.054	0.047	0.045	-0.009
NOA	0.9	0.743	0.711	0.731	0.733	0.744	0.742	0.735	0.708	0.614
$DIST\_E$	-0.298	-0.03	0.012	0.035	0.051	0.066	0.081	0.098	0.126	0.226
SG	0.781	0.475	0.333	0.202	0.178	0.643	0.171	0.19	0.144	0.184
BV/MV	0.825	1.038	1.09	1.072	1.034	0.972	0.863	0.804	0.683	0.535
FCF/MV	-0.198	-0.08	-0.01	0.035	0.102	0.131	0.137	0.152	0.186	0.345

Table.2 (continued)

Panel B: Selected Characteristics for Value/Glamour Decile Portfolios

Sales Growth (SG) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	-0.044	0.007	0.027	0.044	0.059	0.07	0.085	0.108	0.142	0.198
$TACC$	-0.048	0.005	0.023	0.039	0.054	0.063	0.077	0.095	0.122	0.169
NOA	0.593	0.668	0.695	0.71	0.723	0.736	0.75	0.769	0.796	0.919
$DIST\_E$	-0.004	0.049	0.067	0.068	0.068	0.065	0.059	0.044	0.018	-0.07
SG	-0.117	-0.0004	0.039	0.067	0.093	0.122	0.158	0.21	0.312	2.404
BV/MV	1.166	1.136	1.036	0.95	0.872	0.839	0.793	0.761	0.693	0.671
FCF/MV	0.289	0.162	0.125	0.104	0.081	0.071	0.045	0.023	-0.0002	-0.1

Book to Market (BV/MV) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	0.115	0.115	0.102	0.085	0.077	0.063	0.06	0.045	0.032	0.003
$TACC$	0.084	0.091	0.085	0.074	0.068	0.058	0.057	0.044	0.032	0.007
NOA	0.674	0.739	0.739	0.739	0.745	0.745	0.757	0.753	0.741	0.728
$DIST\_E$	-0.003	0.039	0.044	0.045	0.046	0.047	0.042	0.042	0.037	0.026
SG	0.566	0.384	0.423	0.293	0.242	0.187	0.231	0.635	0.162	0.173
BV/MV	0.171	0.326	0.448	0.565	0.682	0.808	0.949	1.128	1.408	2.421
FCF/MV	0.04	0.041	0.044	0.059	0.059	0.077	0.064	0.091	0.098	0.224

Free Cash Flow to Price (FCF/MV) Decile Portfolios

Parameter	Lowest	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	Highest
RE	0.251	0.143	0.121	0.106	0.086	0.06	0.039	0.017	-0.012	-0.114
$TACC$	0.283	0.16	0.117	0.092	0.067	0.042	0.02	-0.003	-0.034	-0.142
NOA	1.082	0.83	0.766	0.739	0.703	0.684	0.672	0.667	0.647	0.571
$DIST\_E$	-0.08	-0.06	-0.03	0.018	0.058	0.086	0.089	0.09	0.09	0.097
SG	0.981	0.592	0.326	0.383	0.248	0.17	0.128	0.146	0.174	0.152
BV/MV	1.25	0.867	0.7	0.615	0.62	0.664	0.764	0.884	1.037	1.514
FCF/MV	-0.663	-0.14	-0.04	0.009	0.046	0.08	0.12	0.172	0.264	0.946

Table 3: Raw & Abnormal Returns to Various Decile Portfolios

Panel A: Raw Returns for Various Decile Portfolios							
Deciles	RE	$TACC$	NOA	$DIST\_E$	SG	BV/MV	FCF/MV
1st Decile	0.239 (4.156)	0.231 (4.356)	0.219 (3.953)	0.091 (1.968)	0.202 (3.946)	0.106 (2.541)	0.122 (2.713)
2nd Decile	0.208 (4.84)	0.221 (4.97)	0.2 (4.496)	0.123 (2.645)	0.177 (4.679)	0.12 (3.298)	0.122 (2.824)
3rd Decile	0.186 (5.115)	0.195 (5.11)	0.17 (4.652)	0.164 (3.845)	0.172 (5.151)	0.145 (3.678)	0.113 (2.814)
4th Decile	0.179 (4.923)	0.18 (5.204)	0.176 (4.957)	0.178 (4.773)	0.167 (5.127)	0.134 (3.83)	0.111 (3.213)
5th Decile	0.159 (5.042)	0.159 (4.974)	0.176 (4.744)	0.174 (4.702)	0.161 (5.077)	0.145 (4.149)	0.147 (3.889)
6th Decile	0.156 (4.694)	0.154 (4.726)	0.163 (4.581)	0.152 (4.407)	0.162 (4.647)	0.159 (4.258)	0.15 (4.775)
7th Decile	0.138 (4.44)	0.136 (3.936)	0.159 (4.689)	0.166 (4.703)	0.166 (4.938)	0.155 (4.527)	0.175 (5.638)
8th Decile	0.134 (3.786)	0.124 (3.633)	0.128 (3.998)	0.175 (5.041)	0.155 (3.826)	0.186 (4.913)	0.185 (5.276)
9th Decile	0.124 (3.38)	0.118 (3.183)	0.122 (3.48)	0.182 (5.219)	0.131 (3.293)	0.198 (4.74)	0.214 (5.847)
10th Decile	0.065 (2.011)	0.073 (2.023)	0.077 (2.065)	0.187 (5.338)	0.097 (2.121)	0.241 (4.639)	0.25 (4.925)
Hedge	0.174 (5.418)	0.158 (5.763)	0.142 (3.793)	0.096 (2.953)	0.105 (4.842)	0.135 (3.528)	0.128 (6.395)

Table 3 (continued)

Panel B: Abnormal Returns for Various Decile Portfolios

Deciles	*RE*	*TACC*	*NOA*	*DIST _E*	*SG*	*BV/MV*	*FCF/MV*
1st Decile	0.078 (3.285)	0.072 (4.081)	0.071 (2.647)	-0.054 (-2.41)	0.038 (2.167)	-0.021 (-1.18)	-0.03 (-2.72)
2nd Decile	0.056 (4.242)	0.07 (5.312)	0.056 (3.507)	-0.02 (-1.22)	0.028 (2.843)	-0.011 (-0.94)	-0.019 (-1.32)
3rd Decile	0.044 (4.371)	0.053 (4.764)	0.024 (2.456)	0.022 (1.338)	0.032 (3.232)	0.012 (0.888)	-0.023 (-1.79)
4th Decile	0.041 (3.504)	0.04 (4.27)	0.034 (3.694)	0.034 (4.279)	0.032 (3.868)	0.002 (0.212)	-0.021 (-2.35)
5th Decile	0.021 (2.397)	0.023 (2.599)	0.035 (3.531)	0.033 (3.306)	0.025 (2.689)	0.011 (1.222)	0.019 (1.562)
6th Decile	0.02 (2.411)	0.016 (1.875)	0.023 (2.535)	0.014 (1.473)	0.024 (2.688)	0.023 (2.314)	0.018 (2.299)
7th Decile	0.004 (0.51)	0.0004 (0.051)	0.021 (2.394)	0.028 (3.153)	0.027 (4.039)	0.014 (1.264)	0.038 (4.343)
8th Decile	-0.0001 (-0.002)	-0.009 (-0.91)	-0.009 (-0.996)	0.038 (4.157)	0.019 (1.477)	0.039 (3.246)	0.047 (4.741)
9th Decile	-0.011 (-1.226)	-0.018 (-1.94)	-0.015 (-1.7)	0.042 (4.141)	-0.0008 (-0.09)	0.041 (3.174)	0.068 (5.372)
10th Decile	-0.07 (-5.044)	-0.064 (-4.78)	-0.056 (-3.928)	0.048 (4.518)	-0.04 (-2.4)	0.073 (3.662)	0.087 (4.743)
Hedge	0.148 (5.471)	0.136 (5.769)	0.127 (3.522)	0.102 (3.474)	0.078 (4.177)	0.094 (3.019)	0.118 (5.901)

Table 4: Statistical Arbitrage Tests on Various Hedge Strategies (Decile Analysis)

Statistical Arbitrage Tests on Various Hedge Strategies (Decile Analysis)							
Strategy	**t-stat.**	**μ (mean)**	**λ (growth rate of st.dev.)**	**H1 (μ>0)**	**H2 (λ<0)**	**Sum (H1+H2)**	**Statistical Arbitrage**
RE	4.554	0.042	-0.512	0.000	0.000	0.000	Yes
$TACC$	4.602	0.039	-0.509	0.000	0.000	0.000	Yes
NOA	4.801	0.037	-0.187	0.000	0.090	0.090	Yes
$DIST\_E$	2.493	0.023	-0.651	0.000	0.000	0.000	Yes
SG	3.183	0.024	-0.664	0.000	0.000	0.000	Yes
BV/MV	2.937	0.034	-0.501	0.000	0.002	0.002	Yes
FCF/MV	6,823	0.036	-0.291	0.000	0.028	0.028	Yes

Table 5: Abnormal Returns for Various Quintile Portfolios

Abnormal Returns for Various Quintile Portfolios					
Quintiles	RE	$DIST\_E$	SG	BV/MV	FCF/MV
1st Quintile	0.067 (4.212)	-0.037 (-2.071)	0.033 (2.784)	-0.016 (-1.154)	-0.025 (-2.147)
2nd Quintile	0.022 (3.393)	0.028 (4.692)	0.027 (4.432)	0.017 (2.63)	0.013 (2.188)
3rd Quintile	-0.04 (-4.152)	0.045 (4.682)	-0.021 (-1.889)	0.057 (3.821)	0.077 (5.576)
Hedge	0.107 (5.593)	0.082 (3.457)	0.054 (3.945)	0.073 (2.919)	0.102 (5.71)

Table 6: Retained Earnings vs. Sales Growth

Panel A: Intersection of Quintiles based on RE and SG

Quintiles	$SG(1)$	$SG(2)$	$SG(3)$	Control Hedge (SG)
$RE(1)$	0.074 (3.842)	0.07 (4.571)	0.011 (0.491)	0.063 (3.145)
$RE(2)$	0.006 (0.544)	0.027 (3.577)	0.003 (0.276)	0.003 (0.22)
$RE(3)$	-0.037 (-1.15)	-0.024 (-2.81)	-0.059 (-4.28)	0.022 (0.665)
Control Hedge (RE)	0.111 (3.089)	0.094 (4.75)	0.07 (2.972)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Long Weighted Average of $\{RE(1), SG(2)\}$ & $\{RE(1), SG(3)\}$	0.055 (3.535)
Short Weighted Average of $\{RE(3), SG(1)\}$ & $\{RE(3), SG(2)\}$	-0.026 (-2.964)
Hedge (RE **) Non-Overlap Strategy**	0.081 (4.138)
Long Weighted Average of $\{SG(1), RE(2)\}$ & $\{SG(1), RE(3)\}$	0.0003 (0.03)
Short Weighted Average of $\{SG(3), RE(1)\}$ & $\{SG(3), RE(2)\}$	0.006 (0.525)
Hedge (SG **) Non-Overlap Strategy**	-0.005 (-0.362)

Panel C: Test-Statistics of a Joint (RE, SG) **Hedge Portfolio Strategy**

Long on $\{RE(1), SG(1)\}$ **& Short on** $\{RE(3), SG(3)\}$	0.133 (6.042)
Difference between (RE, SG) **and** RE **Hedge Portfolio Strategy**	0.026 (2.492)
Difference between (RE, SG) **and** SG **Hedge Portfolio Strategy**	0.079 (5.157)

Panel D: Regression Approach- $ARET$ **as the Dependent Variable**

Constant	RE	SG	$SIZE$
0.107 (5.359)	-0.124 (-5.961)		-0.005 (-2.399)
0.083 (5.352)		-0.057 (-3.471)	-0.007 (-2.994)
0.109 (5.734)	-0.116 (-5.39)	-0.014 (-0.847)	-0.005 (-2.229)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Table 7: Retained Earnings vs. Book to Market Ratio

Panel A: Intersection of Quintiles based on RE and BV/MV

Quintiles	$BV/MV(1)$	$BV/MV(2)$	$BV/MV(3)$	**Control Hedge (BV/MV)**
$RE(1)$	-0.025 (-1.069)	0.06 (3.621)	0.121 (4.544)	0.146 (4.173)
$RE(2)$	0.005 (0.453)	0.019 (2.553)	0.034 (2.193)	0.029 (1.279)
$RE(3)$	-0.049 (-2.367)	-0.036 (-3.716)	-0.032 (-1.438)	0.017 (0.486)
Control Hedge (RE)	0.024 (1.141)	0.096 (4.863)	0.153 (4.31)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Long Weighted Average of $\{RE(1), BV/MV(1)\}$ & $\{RE(1), BV/MV(2)\}$	0.038 (2.539)
Short Weighted Average of $\{RE(3), BV/MV(2)\}$ & $\{RE(3), BV/MV(3)\}$	-0.037 (-3.755)
Hedge (RE) Non-Overlap Strategy	0.075 (3.805)
Long Weighted Average of $\{BV/MV(3), RE(2)\}$ & $\{BV/MV(3), RE(3)\}$	0.024 (1.604)
Short Weighted Average of $\{BV/MV(1), RE(1)\}$ & $\{BV/MV(1), RE(2)\}$	-0.004 (-0.298)
Hedge (BV/MV) Non-Overlap Strategy	0.028 (1.163)

Panel C: Test-Statistics of a Joint $(RE, BV/MV)$ Hedge Portfolio Strategy

Long on $\{RE(1), BV/MV(3)\}$ **& Short on** $\{RE(3), BV/MV(1)\}$	0.17 (4.549)
Difference between $(RE, BV/MV)$ **and** RE **Hedge Portfolio Strategy**	0.063 (2.222)
Difference between $(RE, BV/MV)$ **and** BV/MV **Hedge Portfolio Strategy**	0.097 (4.34)

Panel D: Regression Approach- $ARET$ as the Dependent Variable

Constant	RE	BV/MV	$SIZE$
0.107 (5.359)	-0.124 (-5.961)		-0.005 (-2.399)
0.005 (0.125)		0.075 (1.896)	-0.005 (-1.29)
0.064 (1.596)	-0.111 (-5.56)	0.053 (1.347)	-0.003 (-0.898)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Table 8: Retained Earnings vs. Free Cash Flow Yield

Panel A: Intersection of Quintiles based on RE and FCF/MV

Quintiles	$FCF/MV(1)$	$FCF/MV(2)$	$FCF/MV(3)$	**Control Hedge** **(** FCF/MV **)**
$RE(1)$	0.038 (0.861)	0.028 (1.6)	0.085 (5.2)	0.047 (0.961)
$RE(2)$	-0.023 (-1.42)	0.018 (2.758)	0.068 (4.472)	0.091 (4.6)
$RE(3)$	-0.059 (-5.67)	-0.022 (-1.35)	-0.034 (-0.79)	0.025 (0.572)
Control Hedge **(** RE **)**	0.097 (1.974)	0.05 (2.704)	0.119 (2.56)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Long Weighted Average of $\{RE(1), FCF/MV(1)\}$ **&** $\{RE(1), FCF/MV(2)\}$	0.037 (1.542)
Short Weighted Average of $\{RE(3), FCF/MV(2)\}$ **&** $\{RE(3), FCF/MV(3)\}$	-0.023 (1.554)
Hedge (RE **) Non-Overlap Strategy**	0.06 (2.733)
Long Weighted Average of $\{FCF/MV(3), RE(2)\}$ **&** $\{FCF/MV(3), RE(3)\}$	0.063 (4.231)
Short Weighted Average of $\{FCF/MV(1), RE(1)\}$ **&** $\{FCF/MV(1), RE(2)\}$	0.001 (0.052)
Hedge (FCF/MV **) Non-Overlap Strategy**	0.062 (2.13)

Panel C: Test-Statistics of a Joint $(RE, FCF/MV)$ Hedge Portfolio Strategy

Long on $\{RE(1), FCF/MV(3)\}$ **& Short on** $\{RE(3), FCF/MV(1)\}$	0.144 (7.594)
Difference between $(RE, FCF/MV)$ **and** RE **Hedge Portfolio Strategy**	0.037 (3.176)
Difference between $(RE, FCF/MV)$ **and** FCF/MV **Hedge Portfolio Strategy**	0.042 (2.283)

Panel D: Regression Approach- $ARET$ as the Dependent Variable

Constant	RE	FCF/MV	$SIZE$
0.107 (5.359)	-0.124 (-5.961)		-0.005 (-2.399)
-0.007 (-0.377)		0.141 (6.263)	-0.009 (-3.718)
0.026 (0.783)	-0.061 (-2.056)	0.113 (3.609)	-0.007 (-3.353)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Table 9: Distributed Earnings to Equity Holders vs. Sales Growth

Panel A: Intersection of Quintiles based on $DIST\_E$ and SG.

Quintiles	$SG(1)$	$SG(2)$	$SG(3)$	**Control Hedge (SG)**
$DIST\_E(1)$	-0.006 (-0.206)	-0.025 (-1.497)	-0.074 (-3.919)	0.068 (3.155)
$DIST\_E(2)$	0.036 (3.398)	0.03 (4.205)	0.007 (0.617)	0.029 (2.025)
$DIST\_E(3)$	0.068 (4.168)	0.043 (4.214)	0.029 (1.419)	0.039 (1.652)
Control Hedge ($DIST\_E$)	0.074 (2.512)	0.068 (2.881)	0.103 (3.473)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Long Weighted Average of $\{DIST\_E(3), SG(2)\}$ & $\{DIST\_E(1), SG(3)\}$	0.039 (3.683)
Short Weighted Average of $\{DIST\_E(3), SG(1)\}$ & $\{DIST\_E(3), SG(2)\}$	-0.018 (-0.922)
Hedge ($DIST\_E$) Non-Overlap Strategy	0.057 (2.095)
Long Weighted Average of $\{SG(1), DIST\_E(1)\}$ & $\{SG(1), DIST\_E(2)\}$	0.024 (1.942)
Short Weighted Average of $\{SG(3), DIST\_E(2)\}$ & $\{SG(3), DIST\_E(3)\}$	0.011 (1.081)
Hedge (SG) Non-Overlap Strategy	0.013 (0.866)

Panel C: Test-Statistics of a Joint $(DIST\_E, SG)$ Hedge Portfolio Strategy

Long on $\{DIST\_E(3), SG(1)\}$ **& Short on** $\{DIST\_E(1), SG(3)\}$	0.142 (6.215)
Difference between $(DIST\_E, SG)$ **and** $DIST\_E$ **Hedge Portfolio Strategy**	0.06 (3.184)
Difference between $(DIST\_E, SG)$ **and** SG **Hedge Portfolio Strategy**	0.088 (4.594)

Panel D: Regression Approach- $ARET$ as the Dependent Variable

Constant	$DIST\_E$	SG	$SIZE$
0.023 (1.159)	0.11 (3.497)		-0.012 (-4.782)
0.083 (5.352)		-0.057 (-3.471)	-0.007 (-2.994)
0.042 (1.964)	0.106 (3.383)	-0.045 (-2.864)	-0.011 (-4.206)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Table 10: Distributed Earnings to Equity Holders vs. Book to Market Ratio

Panel A: Intersection of Quintiles based on $DIST\_E$ and BV/MV

Quintiles	$BV/MV(1)$	$BV/MV(2)$	$BV/MV(3)$	Control Hedge (BV/MV)
$DIST\_E(1)$	-0.087 (-3.304)	-0.027 (-1.311)	-0.004 (-0.183)	0.083 (2.409)
$DIST\_E(2)$	-0.001 (-0.086)	0.021 (3.188)	0.06 (3.825)	0.061 (2.338)
$DIST\_E(3)$	0.024 (2.301)	0.04 (3.733)	0.114 (3.853)	0.09 (2.836)
Control Hedge ($DIST\_E$)	0.111 (4.018)	0.067 (2.543)	0.118 (3.392)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Long Weighted Average of $\{DIST\_E(3), BV/MV(1)\}$ & $\{DIST\_E(3), BV/MV(2)\}$	0.034 (4.092)
Short Weighted Average of $\{DIST\_E(1), BV/MV(2)\}$ & $\{DIST\_E(1), BV/MV(3)\}$	-0.019 (-1.09)
Hedge ($DIST\_E$ **) Non-Overlap Strategy**	0.053 (2.368)
Long Weighted Average of $\{BV/MV(3), DIST\_E(1)\}$ & $\{BV/MV(3), DIST\_E(2)\}$	0.048 (3.435)
Short Weighted Average of $\{BV/MV(1), DIST\_E(2)\}$ & $\{BV/MV(1), DIST\_E(3)\}$	0.011 (1.022)
Hedge (BV/MV **) Non-Overlap Strategy**	0.037 (1.737)

Panel C: Test-Statistics of a Joint $(DIST\_E, BV/MV)$ Hedge Portfolio Strategy

Long on $\{DIST\_E(3), BV/MV(3)\}$ **& Short on** $\{DIST\_E(1), BV/MV(1)\}$	0.201 (4.698)
Difference between $(DIST\_E, BV/MV)$ **and** $DIST\_E$ **Hedge Portfolio Strategy**	0.119 (3.74)
Difference between $(DIST\_E, BV/MV)$ **and** BV/MV **Hedge Portfolio Strategy**	0.128 (4.671)

Panel D: Regression Approach- $ARET$ as the Dependent Variable

Constant	$DIST\_E$	BV/MV	$SIZE$
0.023 (1.159)	0.11 (3.497)		-0.012 (-4.782)
0.005 (0.125)		0.075 (1.896)	-0.005 (-1.29)
-0.034 (-0.797)	0.113 (3.835)	0.078 (2.038)	-0.009 (-2.56)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Table 11: Distributed Earnings to Equity Holders vs. Free Cash Flow Yield

Panel A: Intersection of Quintiles based on $DIST\_E$ and FCF/MV

Quintiles	$FCF/MV(1)$	$FCF/MV(2)$	$FCF/MV(3)$	Control Hedge (FCF/MV)
$DIST\_E(1)$	-0.04 (-2.083)	-0.038 (-1.873)	-0.004 (-0.118)	0.036 (0.984)
$DIST\_E(2)$	-0.01 (-0.857)	0.022 (3.898)	0.075 (5.908)	0.086 (6.319)
$DIST\_E(3)$	0.017 (0.373)	0.024 (2.652)	0.089 (4.784)	0.072 (1.495)
Control Hedge ($DIST\_E$)	0.057 (1.16)	0.062 (2.599)	0.093 (2.76)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Long Weighted Average of $\{DIST\_E(3), FCF/MV(1)\}$ & $\{DIST\_E(3), FCF/MV(2)\}$	0.022 (2.404)
Short Weighted Average of $\{DIST\_E(1), FCF/MV(2)\}$ & $\{DIST\_E(1), FCF/MV(3)\}$	-0.035 (-1.894)
Hedge ($DIST\_E$) Non-Overlap Strategy	0.057 (2.494)
Long Weighted Average of $\{FCF/MV(3), DIST\_E(1)\}$ & $\{FCF/MV(3), DIST\_E(2)\}$	0.067 (5.305)
Short Weighted Average of $\{FCF/MV(1), DIST\_E(2)\}$ & $\{FCF/MV(1), DIST\_E(3)\}$	-0.011 (-0.926)
Hedge (FCF/MV) Non-Overlap Strategy	0.078 (5.933)

Panel C: Test-Statistics of a Joint $(DIST\_E, FCF/MV)$ Hedge Portfolio Strategy

Long on $\{DIST\_E(3), FCF/MV(3)\}$ **& Short on** $\{DIST\_E(1), FCF/MV(1)\}$	0.129 (4.443)
Difference between $(DIST\_E, FCF/MV)$ **and** $DIST\_E$ **Hedge Portfolio Strategy**	0.047 (3.868)
Difference between $(DIST\_E, FCF/MV)$ **and** FCF/MV **Hedge Portfolio Strategy**	0.027 (1.997)

Panel D: Regression Approach- $ARET$ as the Dependent Variable

Constant	$DIST\_E$	FCF/MV	$SIZE$
0.023 (1.159)	0.11 (3.497)		-0.012 (-4.782)
-0.007 (-0.377)		0.141 (6.263)	-0.009 (-3.718)
-0.013 (-0.626)	0.057 (2.047)	0.113 (7.629)	-0.011 (-4.069)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Table 12: Statistical Arbitrage Test on Joint Hedge Portfolio Strategies (Quintile Analysis)

Statistical Arbitrage Tests on Joint Hedge Portfolio Strategies (Quintile Analysis)							
Strategy	**t-stat.**	**μ (mean)**	**λ (growth rate of st.dev.)**	**H1 (μ>0)**	**H2 (λ<0)**	**Sum (H1+H2)**	**Statistical Arbitrage**
$RE, BV/MV$	3.774	0.05	-0.456	0.000	0.000	0.000	Yes
RE, SG	4.421	0.04	-0.505	0.000	0.000	0.000	Yes
$RE, FCF/MV$	6.322	0.04	-0.515	0.000	0.000	0.000	Yes
$DIST\_E, BV/MV$	4.215	0.05	-0.501	0.000	0.006	0.006	Yes
$DIST\_E, SG$	6.198	0.041	-0.374	0.000	0.003	0.003	Yes
$DIST\_E, FCF/MV$	4.551	0.036	-0.44	0.000	0.000	0.000	Yes

Table 13: Additional Tests

Panel A: Regressions of $ARET$ on, BV/MV, SG and FCF/MV

Constant	BV/MV	SG	FCF/MV	$SIZE$
0.006 (0.307)		-0.026 (-1.624)	0.135 (5.93)	-0.008 (-3.332)
-0.038 (-0.932)	0.051 (1.342)		0.128 (6.308)	-0.006 (-1.779)
-0.026 (-0.621)	0.047 (1.246)	-0.018 (-1.289)	0.124 (5.86)	-0.006 (-1.721)

Panel B: Regressions of $ARET$ on $TACC$, BV/MV, SG and FCF/MV

Constant	$TACC$	BV/MV	SG	FCF/MV	$SIZE$
0.115 (6.159)	-0.127 (-6.882)		-0.011 (-0.661)		-0.005 (-2.408)
0.069 (1.741)	-0.123 (-7.479)	0.056 (1.43)			-0.003 (-0.926)
0.035 (0.781)	-0.057 (-1.380)			0.101 (2.209)	-0.008 (-3.492)

Panel C: Regressions of $ARET$ on NOA, BV/MV, SG and FCF/MV

Constant	NOA	BV/MV	SG	FCF/MV	$SIZE$
0.12 (5.348)	-0.103 (-3.276)		-0.032 (-1.557)		-0.007 (-2.959)-
0.049 (1.158)	-0.119 (-4.647)	0.09 (2.406)			--0.003 (-0.937)
0.032 (0.803)	-0.063 (-1.635)			0.118 (3.551)	-0.008 (-3.697)

Notes: The regressions are conducted following the Fama and McBeth (1973) procedure of estimating annual cross-sectional regressions and reporting the time series averages of the resulting parameter coefficients. The reported t-statistics in parenthesis are based on the means and standard deviations of the parameter coefficients obtained in the annual cross sectional regressions.

Figure 1: Comparison of Abnormal Returns Based on a Joint (RE, SG), a Basic RE and a Basic SG Hedge Portfolio (Quintile Analysis)

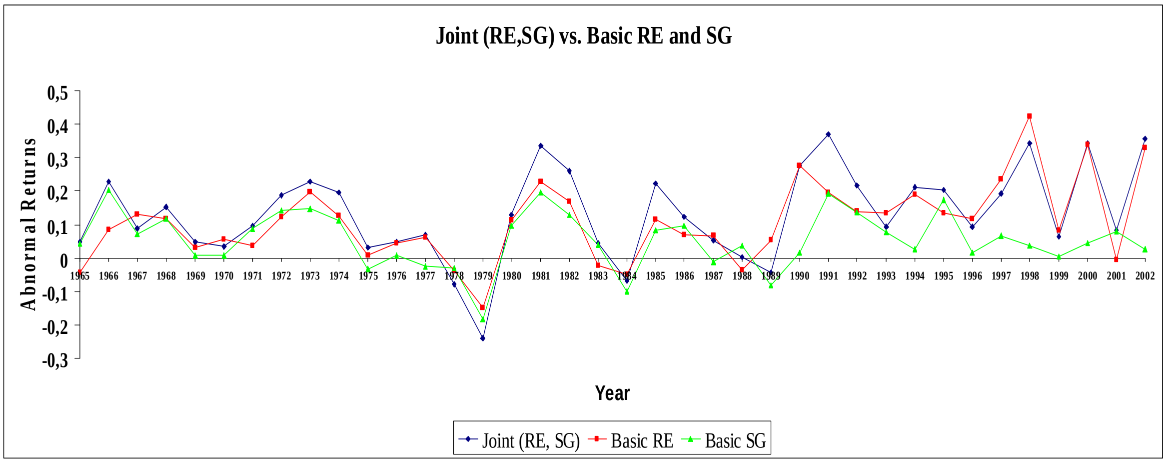


Figure 2: Comparison of Abnormal Returns Based on a Joint $(RE, BV/MV)$, a Basic RE and a Basic BV/MV Hedge Portfolio (Quintile Analysis)

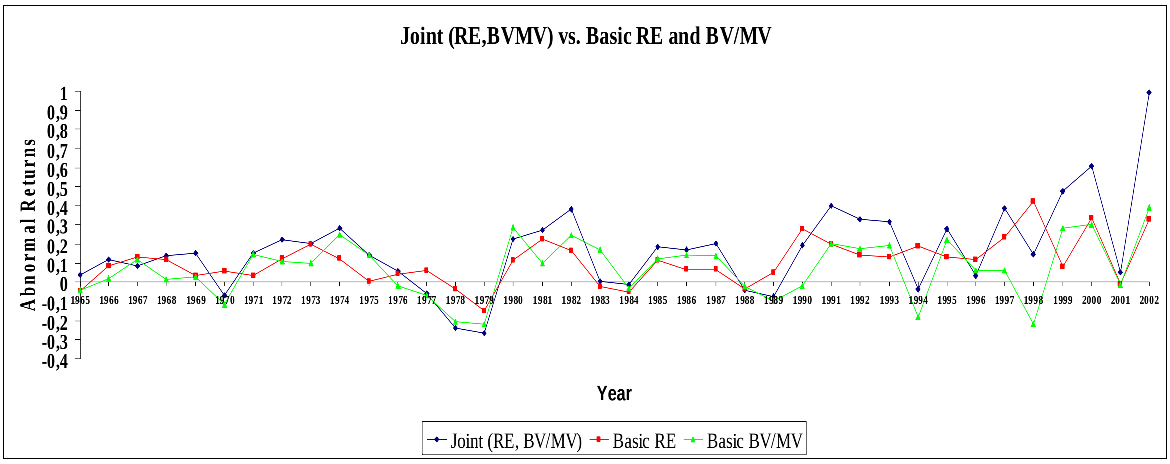


Figure 3: Comparison of Abnormal Returns Based on a Joint $(RE, FCF/MV)$, a Basic RE and a Basic FCF/MV Hedge Portfolio (Quintile Analysis)

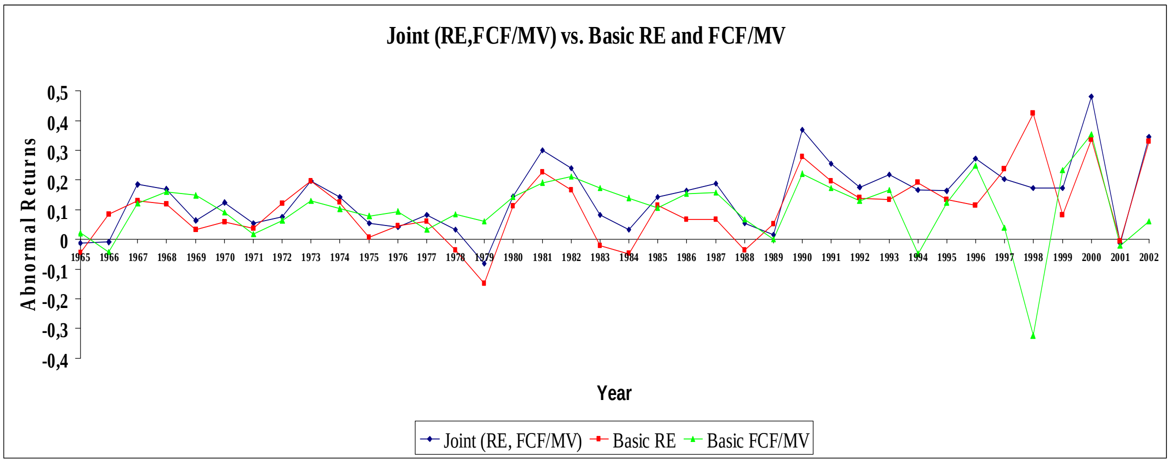


Figure 4: Comparison of Abnormal Returns Based on a Joint $(DIST\_E, SG)$, a Basic $DIST\_E$ and a Basic SG Hedge Portfolio (Quintile Analysis)

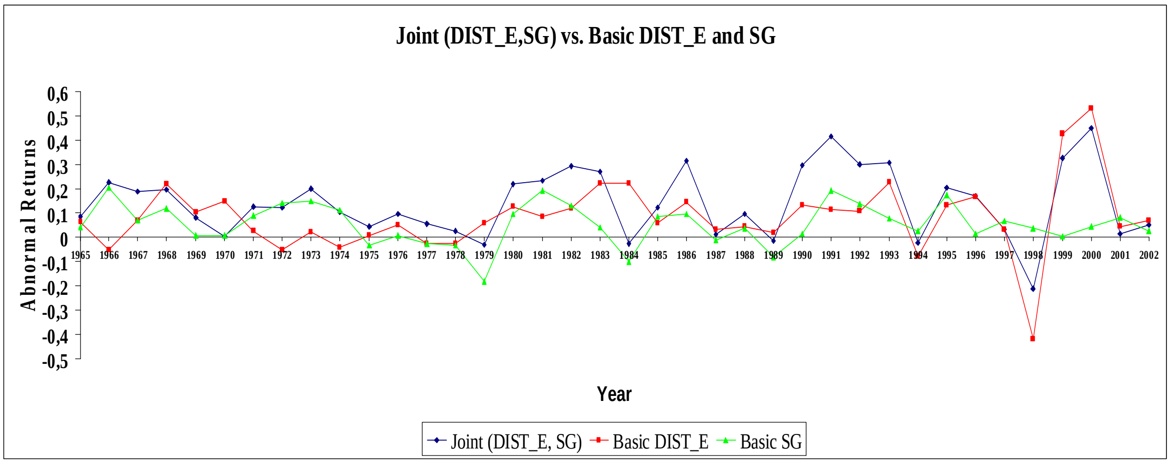


Figure 5: Comparison of Abnormal Returns Based on a Joint $(DIST\_E, BV/MV)$, a Basic $DIST\_E$ and a Basic BV/MV Hedge Portfolio (Quintile Analysis)

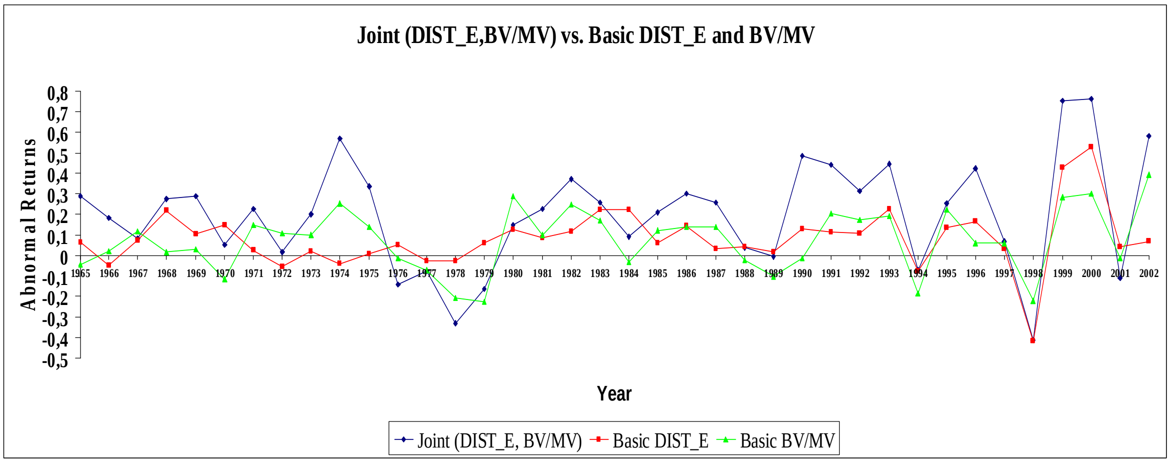
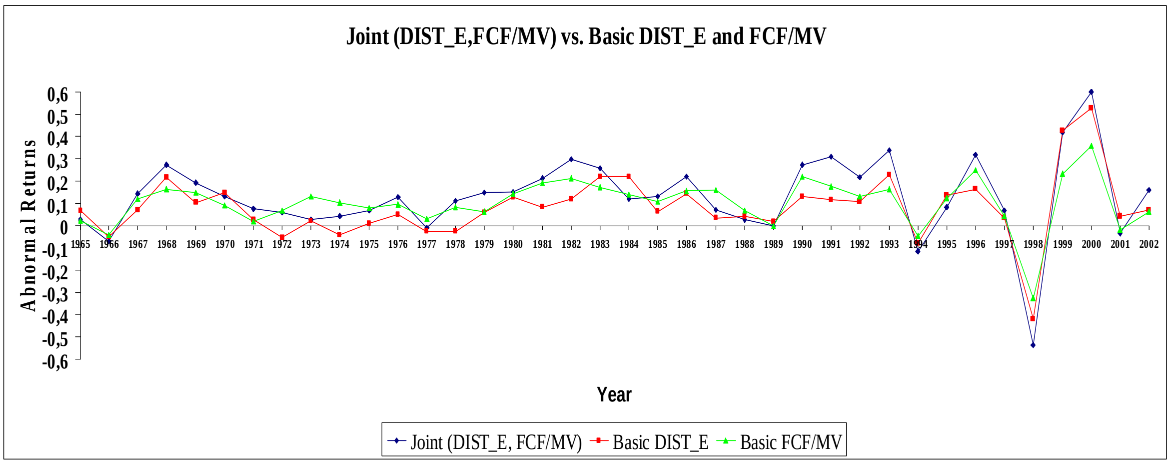


Figure 6: Comparison of Abnormal Returns Based on a Joint $(DIST\_E, FCF/MV)$, a Basic $DIST\_E$ and a Basic FCF/MV Hedge Portfolio (Quintile Analysis)



Appendix

A. Parameters Estimates for the Statistical Arbitrages Tests

The parameters μ, θ, σ, λ are estimated from the following system of four equations with four unknowns:

$$\frac{\partial \log L\left(\mu,\sigma^2,\theta,\lambda \middle| \Delta v\right)}{\partial \mu}: \quad \mu = \frac{\sum_{i=1}^{n} \Delta v_i i^{\theta-2\lambda}}{\sum_{i=1}^{n} i^{2(\theta-\lambda)}} \tag{1}$$

$$\frac{\partial \log L\left(\mu,\sigma^2,\theta,\lambda \middle| \Delta v\right)}{\partial \sigma^2}: \quad \sigma^2 = \frac{1}{n}\sum_{i=1}^{n} \frac{1}{i^{2\lambda}}\left(\Delta v_i - \mu i^{\theta}\right)^2 \tag{2}$$

$$\frac{\partial \log L\left(\mu,\sigma^2,\theta,\lambda \middle| \Delta v\right)}{\partial \theta}: \quad \sum_{i=1}^{n} \Delta v_i \log(i) i^{\theta-2\lambda} = \mu \sum_{i=1}^{n} \log(i) i^{2(\theta-\lambda)} \tag{3}$$

$$\frac{\partial \log L\left(\mu,\sigma^2,\theta,\lambda \middle| \Delta v\right)}{\partial \lambda}: \quad \sigma^2 \sum_{i=1}^{n} \log(i) = \sum_{i=1}^{n} \frac{\log(i)}{i^{2\lambda}}\left(\Delta v_i - \mu i^{\theta}\right)^2 \tag{4}$$

Note that by assuming, $\theta = 0$ and $\lambda = 0$ we get the standard MLE estimators of the mean and the variance of the incremental trading profits of each strategy:

$$\mu = \frac{1}{n}\sum_{i=1}^{n} \Delta v_i \quad \text{and} \quad \sigma^2 = \frac{1}{n}\sum_{i=1}^{n} \left(\Delta v_i - \mu\right)^2$$

B. Unconstraint Mean Test of Statistical Arbitrage

Under the unconstraint mean test, a trading strategy generates statistical arbitrage with $1-\alpha$ percent confidence if the following conditions are satisfied:

H1: $\mu > 0$

H2: $\lambda < 0$

H3: $\theta > \max\left\{\lambda - \frac{1}{2}, -1\right\}$

with the sum of p values for the individual tests forming an upper bound for the type I error a.

Note that by assuming $\theta = 0$ the unconstraint mean test of statistical arbitrage is reduced to a constraint mean test, while by assuming $\theta = 0$ and $\lambda = 0$ it is reduced to a single t-test.

Table A1: Total Accruals vs. Sales Growth

Panel A: Intersection of Quintiles based on $TACC$ and SG.

Quintiles	$SG(1)$	$SG(2)$	$SG(3)$	**Control Hedge (SG)**
$TACC(1)$	0.07 (3.892)	0.077 (6.585)	0.021 (0.832)	0.049 (2.215)
$TACC(2)$	0.012 (0.983)	0.026 (3.37)	0.001 (0.109)	0.011 (0.7)
$TACC(3)$	-0.042 (-1.564)	-0.024 (-3.073)	-0.063 (-4.463)	0.021 (0.755)
Control Hedge ($TACC$)	0.112 (3.522)	0.101 (7.204)	0.084 (2.947)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Hedge ($TACC$) Non-Overlap Strategy	0.092 (5.525)
Hedge (SG) Non-Overlap Strategy	-0.002 (-0.19)

Panel C: Test-Statistics of a Joint $(TACC, SG)$ Hedge Portfolio Strategy

Long on $\{TACC(1), SG(1)\}$ & Short on $\{TACC(3), SG(3)\}$	0.133 (6.494)
Difference between $(TACC, SG)$ and $TACC$ Hedge Portfolio Strategy	0.021 (2.109)
Difference between $(TACC, SG)$ and SG Hedge Portfolio Strategy	0.079 (5.54)

Table A2: Total Accruals vs. Book to Market Ratio

Panel A: Intersection of Quintiles based on $TACC$ and BV/MV.

Quintiles	$BV/MV(1)$	$BV/MV(2)$	$BV/MV(3)$	**Control Hedge (BV/MV)**
$TACC(1)$	0.003 (0.159)	0.063 (4.681)	0.117 (4.483)	0.114 (3.277)
$TACC(2)$	-0.004 (-0.315)	0.019 (2.373)	0.043 (2.981)	0.047 (2.11)
$TACC(3)$	-0.061 (-3.401)	-0.034 (-3.183)	-0.042 (-1.941)	0.019 (0.528)
Control Hedge ($TACC$)	0.064 (3.45)	0.097 (6.042)	0.159 (4.806)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Hedge ($TACC$) Non-Overlap Strategy	0.084 (4.812)
Hedge (BV/MV) Non-Overlap Strategy	0.03 (1.258)

Panel C: Test-Statistics of a Joint $(TACC, BV/MV)$ Hedge Portfolio Strategy

Long on $\{TACC(1), BV/MV(3)\}$ & Short on $\{TACC(3), BV/MV(1)\}$	0.178 (5.014)
Difference between $(TACC, BV/MV)$ and $TACC$ Hedge Portfolio Strategy	0.066 (2.252)
Difference between $(TACC, BV/MV)$ and BV/MV Hedge Portfolio Strategy	0.105 (5.075)

Table A3: Total Accruals vs. Free Cash Flow Yield

Panel A: Intersection of Quintiles based on $TACC$ and FCF/MV.

Quintiles	$FCF/MV(1)$	$FCF/MV(2)$	$FCF/MV(3)$	**Control Hedge (FCF/MV)**
$TACC(1)$	0.001 (0.013)	0.039 (1.807)	0.088 (5.927)	0.087 (1.815)
$TACC(2)$	-0.002 (-0.1)	0.016 (2.461)	0.059 (3.537)	0.061 (2.124)
$TACC(3)$	-0.05 (-5.143)	-0.03 (-2.404)	-0.154 (-4.131)	-0.104 (-2.851)
Control Hedge ($TACC$)	0.051 (1.076)	0.069 (3.198)	0.242 (5.996)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Hedge ($TACC$) Non-Overlap Strategy	0.073 (2.984)
Hedge (FCF/MV) Non-Overlap Strategy	0.048 (1.471)

Panel C: Test-Statistics of a Joint $(TACC, FCF/MV)$ Hedge Portfolio Strategy

Long on $\{TACC(1), FCF/MV(3)\}$ **& Short on** $\{TACC(3), FCF/MV(1)\}$	0.138 (8.033)
Difference between $(TACC, FCF/MV)$ **and** $TACC$ **Hedge Portfolio Strategy**	0.026 (2.104)
Difference between $(TACC, FCF/MV)$ **and** FCF/MV **Hedge Portfolio Strategy**	0.036 (2.335)

Table A4: NOA vs. Sales Growth

Panel A: Intersection of Quintiles based on NOA and SG.

Quintiles	$SG(1)$	$SG(2)$	$SG(3)$	**Control Hedge (SG)**
$NOA(1)$	0.064 (2.764)	0.063 (4.085)	0.042 (1.278)	0.022 (1.079)
$NOA(2)$	0.026 (2.042)	0.029 (3.744)	-0.021 (-2.237)	0.047 (2.811)
$NOA(3)$	-0.073 (-2.667)	-0.016 (-1.639)	-0.061 (-4.08)	-0.012 (-0.454)
Control Hedge (NOA)	0.137 (3.673)	0.079 (3.589)	0.103 (2.598)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Hedge (NOA) Non-Overlap Strategy	0.08 (2.98)
Hedge (SG) Non-Overlap Strategy	0.014 (0.694)

Panel C: Test-Statistics of a Joint (NOA, SG) Hedge Portfolio Strategy

Long on $\{NOA(1), SG(1)\}$ **& Short on** $\{NOA(3), SG(3)\}$	0.125 (4.141)
Difference between (NOA, SG) **and** NOA **Hedge Portfolio Strategy**	0.026 (1.829)
Difference between (NOA, SG) **and** SG **Hedge Portfolio Strategy**	0.071 (2.616)

Table A5: NOA vs. Book to Market Ratio

Panel A: Intersection of Quintiles based on NOA and BV/MV .

Quintiles	$BV/MV(1)$	$BV/MV(2)$	$BV/MV(3)$	Control Hedge (BV/MV)
$NOA(1)$	-0.004 (-0.207)	0.073 (2.648)	0.12 (4.459)	0.124 (3.969)
$NOA(2)$	-0.017 (-1.63)	0.02 (2.626)	0.055 (3.466)	0.072 (3.269)
$NOA(3)$	-0.053 (-2.299)	-0.043 (-4.262)	-0.013 (-0.543)	0.04 (0.964)
Control Hedge (NOA)	0.049 (2.118)	0.116 (3.517)	0.133 (3.607)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Hedge (NOA) Non-Overlap Strategy	0.08 (2.688)
Hedge (BV/MV) Non-Overlap Strategy	0.05 (2.041)

Panel C: Test-Statistics of a Joint $(NOA, BV/MV)$ Hedge Portfolio Strategy

Long on $\{NOA(1), BV/MV(3)\}$ & Short on $\{NOA(3), BV/MV(1)\}$	0.173 (4.432)
Difference between $(NOA, BV/MV)$ and NOA Hedge Portfolio Strategy	0.074 (1.922)
Difference between $(NOA, BV/MV)$ and BV/MV Hedge Portfolio Strategy	0.1 (3.444)

Table A6: NOA vs. Free Cash Flow Yield

Panel A: Intersection of Quintiles based on NOA and FCF/MV .

Quintiles	$FCF/MV(1)$	$FCF/MV(2)$	$FCF/MV(3)$	Control Hedge (FCF/MV)
$NOA(1)$	0.029 (0.498)	0.031 (1.461)	0.107 (5.894)	0.078 (1.291)
$NOA(2)$	-0.022 (-1.658)	0.014 (2.404)	0.063 (4.153)	0.085 (5.033)
$NOA(3)$	-0.057 (-4.952)	-0.019 (-1.741)	-0.012 (-0.305)	0.045 (1.19)
Control Hedge (NOA)	0.086 (1.357)	0.05 (1.878)	0.119 (2.806)	

Panel B: Test- Statistics of Non-Overlap Hedge Portfolio Strategies

Hedge (NOA) Non-Overlap Strategy	0.054 (1.624)
Hedge (FCF/MV) Non-Overlap Strategy	0.059 (1.971)

Panel C: Test-Statistics of a Joint $(NOA, FCF/MV)$ Hedge Portfolio Strategy

Long on $\{NOA(1), FCF/MV(3)\}$ & Short on $\{NOA(3), FCF/MV(1)\}$	0.164 (7.876)
Difference between $(NOA, FCF/MV)$ and NOA Hedge Portfolio Strategy	0.065 (2.484)
Difference between $(NOA, FCF/MV)$ and FCF/MV Hedge Portfolio Strategy	0.062 (2.831)