Research Support
School of Business Administration

May 1994

EARNINGS MANAGEMENT AND THE LONG-TERM MARKET PERFORMANCE OF INITIAL PUBLIC OFFERINGS

Working Paper #9401-29

Siew Hong Teoh
University of Michigan

T.J. Wong
University of Maryland

Gita R. Rao
Fidelity Management & Research Co.

Revised May 1994

First Draft November 1993

Earnings Management and the Long-Term Market Performance of Initial Public Offerings

Siew Hong Teoh*

T.J. Wong**

Gita R. Rao***

* The University of Michigan, School of Business Administration, Ann Arbor, MI 48109-1234, (313) 763-1264,

** College of Business, University of Maryland, College Park, MD 20472,

*** Fidelity Management & Research Co., Boston, MA 02109.

We thank Joe Aharony, John Barber, Robert Bowen, David Hirshleifer, Michael Kirschenheiter, Susan Moyer, Jay Ritter, Jake Thomas, Dan Tinkelman, Sheridan Titman, and Ivo Welch, and workshop participants at the University of British Columbia, Columbia University, New York University, and the University of Washington for helpful comments. We thank Christ James and Jay Ritter for data. Siew Hong Teoh thanks the UCLA Entrepreneurial Studies Center, and the KPMG Peat Marwick Foundation for financial support. Parts of this paper were completed while Gita Rao was at Kidder Peabody & Co. The views expressed herein are those of the authors and do not reflect those of Kidder, Peabody & Co. Nothing in this paper should be construed as investment advice or offer to purchase or sell any securities mentioned herein.

Earnings Management and the Subsequent Performance of Initial Public Offerings

Abstract

We examine empirically whether discretionary accounting accrual choices explain post-issue stock return underperformance for IPO firms. We find that high discretionary accounting accruals are related to negative abnormal stock returns with high statistical significance. For example, a trading strategy of a short position in IPO firms with high discretionary accruals and a long position in IPOs with low discretionary accruals result in a mean (median) excess return of 102% (83.5%) in the 36-month period beginning after the first fiscal year end of the IPO. The evidence is consistent with Ritter's [1991] conjecture that investors are systematically overoptimistic about the growth prospects of IPO firms. The high discretionary accounting accruals seem to be associated with initial overoptimism of investors and subsequent revelation about the appropriateness of the accruals cause a subsequent downward revision in stock prices.

1 Introduction

Several studies have found that initial public offerings (IPOs) tend to underperform in the years after the issue.[1] Over a three year holding period after the offering, Ritter [1991] reports substantially lower returns (mean −27%, median −55%) for a sample of 1,526 IPOs going public between 1975 and 1984 than a size and industry-matched sample of seasoned firms. He conjectures that investors may be systematically overoptimistic about the growth opportunities of the IPO firms and consequently overpay for new issues.

We explore the conjecture of investor overoptimism by examining whether investors rationally evaluate discretionary changes in accounting earnings. If firms adopt discretionary accounting accrual adjustments to manipulate reported earnings prior to or soon after the IPO, and if investors fail to fully discount for this behavior, the firm's prospects for future cash flow growth will be over-estimated. Buyers of the stock in the open market will be willing to pay too high a price. As information about the firm is revealed over time by the media, analysts' reports, and subsequent financial statements, the stock will perform poorly owing to investors' downward revaluation of the firm. Other things equal, the greater the earnings manipulation, the larger will be the ultimate price correction. We empirically examine whether accounting manipulation induces overoptimism by relating the extent of earnings management to the long-run underperformance of IPOs.

For several reasons, it is important to verify whether accounting earnings management is a significant cause of the anomalous post-offer performance of IPOs. First, a strong relation between the degree of earnings management and the subsequent long-run underperformance of IPOs may present an opportunity for profitable trading strategies. Second, the possibility that investor perceptions about the value of a firm may be man-

[1] For example, Stoll and Curley [1970], Ibbotson [1975], Stern and Borstein [1985], Ritter [1991], and Loughran and Ritter [1993] find poor subsequent performance for IPOs. An exception is Buser and Chan [1987]; Ritter [1991] discusses possible reasons for the differences in the findings.

aged by discretionary accounting choices may suggest that managers should consider how such discretionary decisions affect the firm's cost of equity capital. Third, the existence of a relation between earnings management and subsequent return performance provides important information about the effectiveness of current accounting rules and standards in situations where there is high asymmetry of information between investors and the firm. Finally, the relation relates to recent evidence on the informational efficiency of stock markets in evaluating growth opportunities (see Lakonishok, Shleifer and Vishny 1993). The results here add support to the view that the market may be less efficient at valuing firms whose value derives substantially from growth opportunities.

Recent studies have examined whether IPO firms manage accounting earnings but the association between discretionary accounting changes at the time of an IPO and subsequent stock returns has not been examined.[2] Friedlan [1992], and Teoh, Rao, and Wong [1993] report evidence of earnings management during an IPO, whereas Aharony, Lin, and Loeb [1993] do not find evidence of earnings management. Teoh, Rao, and Wong show that the extent of earnings management varies across IPO firms as a function of firm and offering characteristics related to differences in opportunities and incentives for earnings management. Finally, Degeorge and Zeckhauser [1993] report that net income from operations increases prior to reverse leveraged buyouts (public offerings by private firms that were previously publicly traded). This could reflect accounting manipulation, changes in operations to manipulate actual cash flows, the timing of LBOs for when cash flows are most promising, or a combination of these factors.

The empirical tests in this study involve the predictive power of discretionary accounting accruals for future stock returns. In reporting earnings in accordance with

[2]Earnings management has been previously studied in some non-IPO contexts. Earnings management is found to be used to affect bonuses (Healy 1985, and McNichols and Wilson 1988), to strengthen claims of harm from foreign imports (Jones 1991), to reduce regulatory costs imposed by capital ratio requirements on banks (Moyer 1990), and to loosen debt covenant contraints (Defond and Jiambalvo 1994). DeAngelo [1986], however, finds no evidence that managers understate earnings prior to a management buyout.

generally accepted accounting principles (GAAP), a firm is permitted to make adjustments to its cash flows. These adjustments are collectively called accruals and are supposed to reflect more accurately the underlying business condition of the firm. While cash flows are the ultimate "bottom line" for valuation, accountants generally consider the change in cash position as inadequate for conveying the underlying business condition because they are affected by the timing of cash receipts and payments. For example, the decision whether to rent or buy a piece of equipment will drastically affect cash flows but economically may be close to equivalent. Schedules that amortize depreciation expenses (an accrual item) over the life of the equipment can therefore potentially make earnings better reflect economic value. However, managers have discretion over the accrual adjustments (e.g. the length of useful life of the equipment and the depreciation schedule), so it may be difficult for investors to assess whether reported earnings in a given period are appropriate or misleading. Following the accounting literature, *op.cit.*2, we use discretionary accruals to measure the extent of earnings management in the empirical tests.

We consider two alternative start dates for the cumulation of returns and two holding periods since it is unclear how long after the IPO investors may be misled and when a more accurate revaluation occurs. We cumulate from the day after the IPO and from the end of the first fiscal year after the IPO, and examine holding periods of twelve and thirty-six months. We find that discretionary accruals predict negative abnormal stock returns with high statistical significance. The higher are abnormal accounting accruals during the fiscal year of the IPO, the more negative are subsequent cumulative abnormal stock returns in the one to three years subsequent to the first fiscal year-end after the IPO. A similar but weaker relation is found between abnormal stock returns cumulated immediately after the IPO and the discretionary accruals of the previous fiscal year. Furthermore, we find that the relation is stronger for discretionary accruals affecting working capital than for discretionary total accruals (which also includes non-working capital accruals). This is consistent with our hypothesis since managers have greater

discretion over working capital accruals than non-working capital accruals. The negative relation between accruals and post-IPO stock performance holds after normalizing for the variables used by Ritter [1991] to predict long-run market performance. Since accruals are adjustments to cash flows that reflect the firm's economic status (i.e. prospects for future cash flows), our evidence is consistent with Ritter's conjecture that overoptimism about growth prospects explain the post-IPO underperformance.

Finally, we construct trading strategies based on discretionary accruals. Using a trading strategy of a short position in IPO firms with the highest quintile discretionary accruals and a long position in IPOs with the lowest quintile discretionary accruals, we find that an investor would have earned a 36-month holding period mean (median) return of 102% (83.5%), or a mean (median) monthly return of 1.4% (1.5%) in the 36 month period following the first fiscal year-end subsequent to going public.

The rest of the paper is organized as follows. Section 2 describes the IPO process and analyzes how earnings management might affect the long-run underperformance of IPO stocks. Section 3 describes the sample selection and data. Section 4 presents the regression results for the relation between the measures of earnings management and post-offering stock prices. Section 5 reports on the profitability of two alternative trading strategies based on discretionary accruals. Section 6 concludes the paper.

2 Earnings Management and Stock Return Underperformance

This section examines the circumstances under which earnings management can lead to subsequent long-run return underperformance. Earnings management is defined here as the purposeful intervention of the external reporting process (Schipper 1989). We first discuss the role of accounting in the IPO process and why earnings management can be important for firms engaging in an IPO.

There are noteworthy features of the IPO process which seem to favor earnings

management. There is relatively little information available to investors from public sources about private firms. Rao [1993] reports that there is almost no news media coverage of firms in the years before going public. The paucity of information about the issuer forces investors to rely primarily on the financial statements reported in the prospectus. Klein (1992) finds that the offer price is positively related to reported earnings per share. The lack of other sources of information to corroborate the financial statements may make it hard for investors to judge the appropriateness of the reported accounting numbers. The severe asymmetry of information between issuers and potential investors regarding the value of the firm, and the need for investors to rely heavily upon accounting statements provide a strong incentive for issuers to manage earnings.

However strong these incentives might be, earnings management will only occur if opportunities exist as well. One regulatory limit on discretion is that the accounting reports presented in the offering prospectuses must be audited by an external accounting firm to verify compliance with generally accepted accounting principles (GAAP). Nevertheless, GAAP does permit accounting discretion.[3] The use of an accrual accounting system mandated by GAAP involves discretion in recognizing the timing and amounts of revenues and expenses.[4] Furthermore, the Accounting Principles Board Opinion 20 allows a company engaging in an IPO to change its accounting choices via retroactive restatement for all the financial statements presented in the offering prospectus. This gives the issuer an exceptional opportunity to doctor the profile of accounting earnings in the pre-issue fiscal years.

A second regulatory limit on earnings management is that investment bankers, auditors and entrepreneurs are subject to lawsuits for misrepresenting information reported in the accounting reports. Based on discussions with investment bankers, it appears

[3]We focus on discretionary accounting choices consistent with GAAP, not on fraudulent manipulation.

[4]For example, by shipping out its products earlier, the firm can recognize revenues from the sales earlier even if the cash payments do not come any sooner. Examples of economic and accounting situations where the firm can affect reported income are discussed in the appendix.

that the underwriters' due diligence process generally does not include verification of the firm's audited financial statements. The underwriters, in general, rely upon the auditor's opinion regarding the accuracy of the reported accounting numbers, and focus the due diligence investigations on other information reported in the prospectus. Especially during "hot issue" markets, investment bankers and auditors with a heavy underwriting calendar may be unable to keep up with demand. The quality of the due diligence effort and the quality of the financial statements would presumably suffer as a consequence.

The above discussion suggests that investors may be misled by high earnings numbers both pre- and post-IPO. The benefit from the higher offer price resulting from the high pre-IPO earnings is obvious. In addition, the firm also has an incentive to boost earnings *after* the IPO to maintain a high market price. The original entrepreneurs may wish to sell some of their personal holdings in the secondary market at the end of the lockup period. Entrepreneurs commonly commit not to sell their personal holdings during a lockup period lasting 180 days or longer immediately after the IPO. Furthermore, verbal earnings projections are commonly made to investors during road shows when the marketing of the issue begins.[5] After trading begins, the security analysts initiating coverage of the firm will generally disseminate the earnings projections widely. To support the initial offer price, analysts at the underwriting investment banking firms are under pressure to make the most favorable earnings projections possible. In turn, the issuing firm is under pressure to meet those projections in the aftermarket to safeguard its reputation for reliability, to maintain the goodwill of investors, investment bankers, and analysts who made the initial earnings projections, and to avoid lawsuits by disgruntled shareholders.

Thus, the firm may have an incentive to manage earnings pre-IPO and for months after the IPO when it is relatively difficult for investors to evaluate the appropriateness of the accrual adjustments with a relatively short reporting history. Over time, as infor-

[5]The boilerplate in the prospectus of U.S. IPOs does not include earnings projections, possibly out of the investment banker's fear of lawsuits. In the U.K., written earnings projections are mandatory.

mation is revealed through the media and in later financial statements, the stock price will adjust depending on whether the appropriateness of these accounting adjustments is corroborated or rejected.

In summary, we hypothesize that IPOs whose earnings were supported by high discretionary accruals rather than high cash flows will have greater correction in price. We test this hypothesis by relating the discretionary accruals pre- and post-IPO to the subsequent stock returns.

Our hypothesis that accounting accruals can predict post-IPO stock return underperformance requires both earnings management and investor credulity. The existence of earnings management alone does not necessarily imply that IPOs are overvalued in the initial aftermarket.[6] So long as the market is informationally efficient in the semi-strong form, investors will adequately discount the stock price to reflect the expected amount of earnings management observable from public information sources.[7] In such a setting, no post-IPO downward drift in abnormal stock returns will be observed. Our hypothesis requires that investors do not rationally discount for earnings management in forming their expectations about future cash flows.

3 Sample Selection and Data

The initial sample consists of 130 IPOs issued between 1980 and 1984 for which we have prospectuses.[8] We eliminated firms if Compustat financial data and CRSP returns data

[6]Overvaluation in the aftermarket does not imply that initial subscribers pay too much since new issues are on average underpriced, i.e. the offering price is lower than the aftermarket price as of the close of the first trading date. We do not examine initial underpricing; see Ibbotson and Ritter [1994] for a summary of the evidence of underpricing and several theoretical explanations of the phenomenon. Our focus is on returns subsequent to the offer so we exclude the initial return in our calculation of the holding period return.

[7]Earnings management may still occur in an economy with rational investors. On the related topic of cash flow management, see e.g. Narayanan [1985] and Stein [1989].

[8]We thank Chris James and Jay Ritter for the prospectuses.

were unavailable, if the offer price was less than one dollar, if the size of the offering was smaller than $1m, and if the issue was not solely common equity. For the final sample of 111 firms, we collected pre-IPO financial data from the prospectuses and post-IPO financial data from Compustat. The sample sizes vary across regressions depending on the availability of holding period returns. Three firms were delisted within the 36 month period after the first fiscal year end: one merged 7 months after the first fiscal year end, the second firm was delisted 17 months after the first fiscal year end and the third firm was delisted 30 months after the first fiscal year end. There were four firms that switched from NASDAQ to the NYSE, and three that switched to the AMEX. For these firms, the stock returns were tracked across exchanges.

Table 1 provides descriptive statistics on the sample. A large number of industries are represented in the sample with a concentration in the oil and gas and high-technology industries, and a clustering of IPOs in 1983. In addition, the offering and firm characteristics are similar to those of Ritter's sample of IPOs during the 1975-1984 period.

3.1 Empirical Measures

As previously described, accounting earnings are accrual-adjusted cash flows for the firm. The accounting accrual adjustments can be either discretionary or non-discretionary. We use discretionary accruals to measure the extent of earnings management following the accounting literature; *op.cit.*2. The discretionary accruals are calculated as the difference between accruals and a measure of expected accruals estimated using a cross-sectional adaptation of the Jones [1991] model described below. We consider both discretionary working capital accruals and discretionary total accruals. The former is generally considered to be more susceptible to manipulation; see e.g. Guenther [1994].

Working capital accrual (WKA) is calculated as the change in current assets (Compustat item 4) net of cash and marketable securities (item 1) minus the change in current liabilities (item 5) net of the current maturity of long-term debt (item 44). Total accrual (TAC) is net income (item 172) minus operating cash flow. Operating cash flow

(OCF) is calculated as working capital from operations (item 110) minus working capital accruals.[9] The pre-IPO financial items are obtained from either the balance sheet or the statement of changes in financial position in the financial statements presented in the prospectuses, and the post-IPO data are obtained from Compustat using the item numbers noted.

The expected working capital accrual is the projection of working capital accrual on the year-to-year change in sales in a cross-sectional regression of all firms in the same 2-digit SIC code excluding the IPO firm in the issue year. Discretionary working capital accrual is estimated as the abnormal working capital accrual in the regression. Similarly, the expected total accrual is the cross-sectional projection of total accrual on the change in sales as well as gross property, plant, and equipment. The discretionary total accrual is again the abnormal total accrual in the regression (see the appendix for details).

Since the degree of cross-sectional homogeneity differs across industries, the expected accruals measure is more noisy for some industries than for others. To control for these differences, we standardize the discretionary accruals by the standard deviation of the residuals from the cross-sectional regression for expected accruals. Consistent with Jones [1991] and Defond and Jiambalvo [1994], the accruals are deflated by lagged total assets to reduce heteroscedasticity.[10]

The cross-sectional regression procedure for obtaining discretionary accruals has the advantage that it removes the effects of changing economic conditions on discretionary accruals. An initial public offering is likely to be associated with major changes in the firm's investment opportunity set, and these economic changes will influence accruals independent of any manipulation. The alternative approach of using the annual change in accruals will incorrectly include the effects of changing investment opportunity sets on accruals.

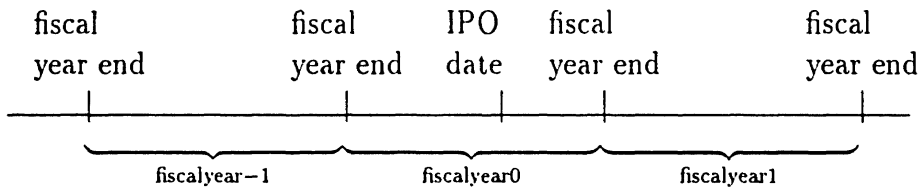
[9]The operating cash flow definition has been used by Bowen, Burgstahler and Daley [1986], and Defond and Jiambalvo [1994] among others.

[10]For some IPO firms for which total assets in year -2 relative to the IPO year are not available, total assets in year -1 are used instead. See Figure 1 for time line.

We note two limitations of the cross-sectional procedure. First, the level of accruals may depend on the stage in the life cycle of a firm. Using seasoned firms to measure expected for accruals for IPO firms may result in measurement errors. In the absence of a life cycle theory for accruals, we assume that these measurement errors are white noise. The regression procedure also assumes that sales and fixed assets are not manipulated, and that they substantially determine non-discretionary accruals. Thus, if management accelerates sales revenue recognition, we will be underestimating discretionary accruals. However, a wide variety of manipulations remains detectable with the cross-sectional procedure. Some examples are: pushing sales by allowing more low-quality credit sales in proportion to total sales relative to the industry, a decrease in the provision of bad debts, and dipping into LIFO layers when input prices are rising or buying more inventory by LIFO firms when input prices are falling (see appendix for other manipulations.)

The timing convention is illustrated in Figure 1. The fiscal year of the IPO is year 0 with all other fiscal years coded relative to year 0. Thus, fiscal year -1 ends before the date of the IPO. For some IPOs, the latest available financial data in the prospectuses are for fiscal year -1. For others, partial year (interim) data may also be reported in the prospectuses if the IPO occurred before annual results are available for the current fiscal year of the IPO. Generally, interim data is available for the months up to 90 days before the IPO date. For example, an IPO in the 9th fiscal month may report financial results of the first 6 months of fiscal year 0 along with the financial results of the full fiscal year -1 in the prospectus. Fiscal year 0, therefore, may include both pre- and post-IPO information.

Figure 1: Time Line



We consider both year -1 and year 0 discretionary accruals in the empirical tests. As discussed earlier, year 0 discretionary accruals, which capture post-IPO earnings management, are interesting to consider because of managers' incentives to manage earnings in the period immediately following the IPO.

The post-IPO return underperformance is measured using continuously compounded returns ($\Pi(1 + r_{it})$) beginning on two alternative dates and for two window lengths. The two start dates are the second trading date after the IPO and the first trading day of fiscal year 1. The two window lengths are 252 trading days and 756 trading days (approximately 1 and 3 years respectively). We considered the three year window because Ritter [1991] reported underperformance for as long as 3 years after the IPO date.

The holding period is until the end of the compounding interval or the delisting date, whichever is earlier. This is equivalent to a buy and hold strategy where the stock is purchased at the beginning of the window and held until the end of the window or until its delisting. To prevent overlapping periods for the discretionary accruals and holding period returns, the discretionary accruals in year -1 are related to stock returns continuously compounded from the second trading day whereas the discretionary accruals in year 0 are related to stock returns continuously compounded from the first trading day of fiscal year 1.[11]

The market return in the regression is either the value-weighted NYSE & AMEX portfolio return or the NASDAQ value-weighted market return depending on the exchange listing of the IPO. The market returns are also continuously compounded over the same holding period as the post-IPO returns in the regression.

[11] One concern is that investors may not be able to calculate year 0 discretionary accruals until the annual report for year 0 is available, which is usually about 60-90 days after the end of year 0. Thus, we also consider the return compounding period beginning on day 61 of fiscal year 1. The qualitative results are similar with when the return compounding period begins on the first trading day of year 1, and so are not reported here.

4 Regression Results

To estimate the relation between discretionary accruals and underperformance, we perform a multiple regression of the holding period returns on the discretionary accruals in addition to the other explanatory variables considered by Ritter [1991]. The control variables include the continuously compounded market return over the same cumulation interval, the first trading day return less the market return, the logarithm of one plus age where age is the number of years from incorporation to the IPO issue year, the volume of IPOs in the year of the issuance, and a dummy variable for firms in the oil and gas (SIC 13) and high-technology industries (SIC 35, 36, 38 and 73). Following Ritter [1991], we included a separate dummy for high-technology and oil and gas stocks because they performed poorly relative to other industries during the 1980-84 period of our study. As a diagnostic check, we also performed the regressions including industry slope dummies for the market return variable to allow for industry differences in the market model beta. Firms were grouped into twelve industry codes following the classification in Ritter [1991]. Since the results were similar, we report only the simpler regressions where the coefficient on the market return variable is constrained to be equal across industries.

The regression results are reported in tables 2-5. Tables 2 and 3 describe the regression of $LCR3(FYR1))$, the three-year continuously compounded return from the first trading day of fiscal year 1, and $LCR1(FYR1))$, the one-year continuously compounded return from the first trading day of fiscal year 1, respectively on the discretionary accruals of year 0. Tables 4 and 5 report the regression of $LCR3(IPO))$, the three-year continuously compounded return from the IPO date excluding the initial return, and $LCR1(IPO))$, the three-year continuously compounded return from the IPO date excluding the initial return, respectively on the discretionary accruals of year -1. In each table, the top panel reports the results of the regression on discretionary working capital accruals and the bottom panel on discretionary total accruals. We chose the regression specification with log returns as dependent variables and standardized residuals to avoid

the non-normality of residuals reported by Ritter [1991] for his regressions using raw returns. The inferences, however, are generally not sensitive to the form of the dependent variable and the discretionary accruals. The regressions are generally well-specified with highly significant $F-$statistics (at less than the .5% level). All the regressions have insignificant chi-square statistics for the White test for heteroscedasticity and, with one exception only, insignificant Shapiro-Wilk statistics for the test of non-normality of the regression residuals.

Focusing on the variable of interest, the evidence in Tables 2 and 3 indicates that discretionary accruals are negatively related to subsequent cumulative returns for IPOs. The regression coefficient estimates for the discretionary working capital accruals for year 0 are negative in both tables, and statistically significant at the 2% level. The regression coefficient for the discretionary total accruals is also negative but the statistical significance is weaker. The coefficient is not significant in the 3-year holding period regression in Table 2, and is significant at the 4% level (1-tailed) for the 1-year holding return regression of Table 3.

The regression results are robust with respect to possible outliers. We used the Belsley, Kuh, and Welsch [1980] DFFITS procedure in SAS to remove potential influential points as a diagnostic check on the regression. The procedure confirms the previous results and in all cases improves the statistical significance of the discretionary accruals variables. For example, the standardized discretionary total accrual for year 0 is now significant at the 8% level in the regression using $LCR3(FYR1)$ returns as the dependent variable, and is significant at the 5% level when market model betas are allowed to vary across industries.

Comparing discretionary working capital accruals and total accruals, the relation with returns appears to be stronger for discretionary working capital accruals. This is consistent with working capital accruals being more susceptible to manipulation than total accruals.

Turning to the other explanatory variables, we compare our results in Tables 2 and

3 with Ritter's [1991] regression (which does not contain discretionary accruals). Ritter reports an estimated market-model beta of only 0.8 in his regression. He views this as surprising since IPO firms are generally thought to be risky. In our regressions, we do indeed find statistically significant and larger betas ranging from 1.15 to 1.6. As in Ritter, the underpricing variable (market-adjusted initial return) is negative, but the coefficients are significant only for the regression with discretionary total accruals. The coefficients for the oil and gas and high-technology industry dummy are negative and statistically significant at the 1% level in both Tables 2 and 3, consistent with Ritter's finding. Unlike Ritter, however, we find that generally the coefficients for age and volume are not statistically significant at conventional levels. It is possible that the information contained in age and volume for predicting returns is already reflected in the discretionary accruals variables, and hence they do not provide marginal explanatory power in the regressions. The discretionary accruals are correlated with these variables.

Considering next the results in Tables 4 and 5, the marginal explanatory power of pre-IPO accruals for stock returns is significantly lower when the holding period begins on the second trading day of the IPO than on the first trading day of year 1. The coefficients on the discretionary working capital accruals are negative but not significant at conventional levels. The DFFITS procedure for trimming outliers improves the level of significance substantially; in the regression with the 1-year holding period return, the coefficient for discretionary working capital accruals is -0.04 with a t-statistic of -2.313 and a p-value of 2%. The coefficients for the discretionary total accruals variables are marginally significantly negative at conventional levels, and again the level of significance improves with the DFFITS procedure.

A possible explanation for the weaker results using discretionary accruals in the pre-IPO period is that issuing firms continue to manipulate accruals after the IPO date. As discussed in the introduction, a manager may wish to support the stock price in the aftermarket if he plans to sell his holdings after the lock-up period, avoid lawsuits, and meet previous earnings projections to maintain his reputation. The mean change year-to-

year in earnings is 0.133, 0.098, and 0.016 in year -1, 0, and 1 respectively. Even without after-market earnings management, it may be that the window beginning immediately after the offering includes a period before investors overoptimism induced by earlier manipulation has dissipated. Consistent with these arguments, Ritter [1991] reports significant *positive* abnormal returns in the first two months of seasoning. A holding period return beginning at the start of fiscal year 1 will usually exclude the entrepreneur's lock-up period. This avoids the period when post-IPO earnings management continues to influence investors perceptions to be overoptimistic.

In summary, we find evidence of a highly significant negative relation between long-run post-IPO stock returns and discretionary accruals. The relation is stronger for holding period returns compounded from the first fiscal year after the IPO than when compounded immediately after the IPO date. The relation is also stronger for discretionary working capital accruals than for discretionary total accruals, consistent with the common belief that working capital accruals are more susceptible to manipulation. The marginal explanatory power for returns contributed by the discretionary accruals over the other explanatory variables found by Ritter provides additional insights into the anomalous subsequent underperformance of IPOs. In particular, it lends support to the hypothesis that investors are being misled by accounting accrual adjustments into becoming overoptimistic about the firm.

5 Returns to a Trading Strategy Based on Discretionary Accruals

In this section, we examine the profitability of a trading strategy based on the sign and magnitude of discretionary accruals. Given the results of the previous section, we consider two trading strategies based only on the discretionary working capital accruals in the year of the IPO. In the first strategy, we sort all firms in the sample into five quintile groups based on their fiscal year 0 discretionary accruals. Beginning on the first

trading day in fiscal year 1, a short position is taken in the quintile with the largest discretionary accruals (portfolio S) and a long position in the quintile with the smallest discretionary accruals (portfolio L). The raw returns, exchange market adjusted returns (i.e. the market return of the exchange where the IPO is listed), and NYSE and AMEX market adjusted returns to the trading strategy are tracked each month for up to 36 months.

In the second trading strategy, we sort all firms in the sample by their size (market capitalization on the IPO date). For each contiguous pair, we assign firms into two groups depending on their year 0 discretionary accruals. The firm that has the larger discretionary accrual is assigned to the short portfolio and the firm with the smaller discretionary accrual is assigned to the long portfolio. This procedure minimizes any difference in size between the long and short portfolios. If size is a risk factor, the second trading strategy comparing size-adjusted returns between the long and short portfolios has an advantage over the first trading strategy. The second trading strategy also has the advantage that all firms in the sample are used. However, the first strategy achieves a greater difference in discretionary accruals between long and short portfolios since three middle quintiles are ignored. Both trading strategies are implemented in event time, and not calendar time.

For each strategy, we consider both monthly returns (21 trading days), and also returns over holding periods of 3, 6, 9, 12, 24, and 36 months. Three firms were delisted in the 36 month period under consideration. The proceeds from the delisted firm are assumed to be reinvested in the remaining firms in the portfolio. Thus, the portfolios are rebalanced when the delisting occurs.[12]

Table 6 reports the mean monthly returns on the long (L) and short (S) portfolios selected based on the quintile group of the fiscal year 0 discretionary accruals for the 36 month period beginning month 1 of fiscal year 1. The difference in returns $(r(L) - r(S))$

[12]The mean and median values reported are calculated from the remaining firms in the portfolio upon delisting. Since only three firms were delisted, the results are unlikely to be influenced substantially by the delisting procedure chosen.

between the long and short portfolios can be interpreted as profits to a zero investment portfolio of going long in portfolio L and shorting an equivalent amount in portfolio S. Summary statistics (mean and median) for the returns over the 36 months are also reported. Table 7 reports the mean monthly returns to the size-adjusted trading strategy. Since mean returns are potentially sensitive to extreme values, we also report median monthly returns and summary statistics (mean and median) for the 36 month period in Tables 8 and 9.[13] The mean and median returns over various holding periods are reported in Table 10 for the trading strategy based on sorting on year 0 discretionary accruals and in Table 11 for the size-adjusted trading strategy. In order to interpret the difference in returns between the long and short portfolios as trading strategy excess returns, we also report the mean and median differences in factors considered to influence returns. These include the Scholes-William beta, market/book ratio, and firm size.

Over the 36 month period, Table 6 and 8 indicate that by going long in the quintile group with the smallest discretionary accruals and going short in the quintile group with the largest discretionary accruals, an investor would earn positive returns in the majority of the months (25 out of 36 months). A similar conclusion is reached for the size-adjusted trading strategy which yielded positive returns for 20 months in Table 7 and for 27 months in Table 9. In addition, in all of the holding periods (3, 6, 9, 12, 24, and 36) in Tables 10 and 11, the mean and median return to the trading strategies were positive.

The mean over the entire 36 month period of the mean monthly excess return is 1.4% in Table 6 and the median monthly excess return is 2.3% in Table 8. Both the t-statistic for the difference in means and the Wilcoxon signed-rank statistic for the difference in medians between portfolios L and S are statistically significant at conventional levels.

Similar though weaker results are reported in Tables 7 and 9 for the size-adjusted trading strategy. The weaker results are not surprising given the smaller differences

[13]While the median returns cannot be interpreted as returns earned for portfolio L and S or trading strategy profits, they serve as diagnostic checks by providing information for comparing the distribution of returns to portfolios L and S.

in the discretionary accruals between the L and S portfolios than reported in Tables 6 and 8. The mean monthly excess return between the L and S portfolios is 0.8% and significant only at 10% level (one-tailed). The differences in the median monthly returns, however, achieve greater statistical significance. In Table 9, the mean (median) difference in median monthly returns between portfolios L and S is 1.2% (1.6%), and both the *t*-statistic for difference in mean and Wilcoxon signed rank statistic for diffference in median are statististically significant at less that 1% level.

The results in Tables 10 and 11 provide information about the holding period excess returns from the two alternative trading strategies which confirm the findings of the monthly returns in Tables 6 and 7. In all the holding periods considered, either trading strategy yields excess returns. The mean and median returns are generally statistically significant at the one-tailed conventional levels, with the median test having greater level of significance possibly due to large values affecting the mean measure. The level of statistical significance is also greater for the longer holding periods of 24 and 36 months. One explanation for this is the continuing downward revaluation of the firm by investors beyond the first fiscal year as more details of the financial statements needed to evaluate discretionary accruals become available.

In Table 10, the 36-month holding period mean return of the portfolio of the quintile with the smallest discretionary accrual is 125% and for the portfolio with the largest discretionary accrual is 22.8%. Thus, by going long in the small discretionary accrual quintile and going short on the large discretionary accrual quintile, an investor will earn a mean excess return of 102% with p-value of 2% (1-tailed). The corresponding holding period median return is also high (83.5%, p-value 1%). In Table 9, the size-adjusted trading strategy yields a 36-month holding period mean return of 70% (p-value .5%) and a median return of 45.4% (p-value $< 1\%$).

We also compare the market-adjusted returns to portfolios L and S since the returns could be affected by differences in the market return during the test period between the two portfolios. The conclusions are unchanged. Returns to portfolio L are generally

larger than returns to portfolio S. Thus, by going long in portfolio L and short in S, an investor would earn statistitically significant positive excess market adjusted returns in the majority of the months in the 36 month period, and over the various holding periods reported in Tables 10 and 11. For example, in Table 6, the value-weighted exchange-market adjusted excess monthly returns are positive in 25 of the 36 months, and the NYSE and AMEX market adjusted abnormal monthly returns are positive in 24 of the 36 months. The mean monthly abnormal returns are 1.4% in either market adjustments in Table 6. The median monthly excess returns range between 1.5% and 2.3% in Table 8. Consistent with the results for unadjusted returns, the market adjusted returns for the trading strategies are statistically significant at conventional levels. The holding period market adjusted returns in Tables 10 and 11 confirm these results.

Finally, Tables 10 and 11 provide some diagnostic checks on the trading strategy approach. For all holding periods considered, the Scholes-William betas, market/book ratio, and firm size are not significantly different between the long and short portfolios. Thus, the excess returns are derived from the trading strategy based on differences in discretionary accruals and not from differences in the risk factors between the long and short portfolios.

6 Conclusion

This paper examines the relation between earnings management by firms at the time of IPOs and the long-run post-IPO return underperformance documented in previous studies (e.g. Ritter [1991] and Loughran and Ritter [1993]). We explore Ritter's [1991] conjecture of overoptimism by examining whether investors rationally evaluate discretionary changes in accounting earnings. If firms manipulate their discretionary accounting choices prior to or soon after the IPO, and if investors fail to discount fully for this fact, then investors may be misled as to the firm's future prospects for cash flow growth. Any such overvaluation at the time of the IPO will eventually result in disap-

pointment, leading to post-IPO return underperformance. We examine the possibility of accounting-induced overoptimism by relating the size of abnormal accruals to the long-run underperformance of the IPO.

We find with strong statistical significance that high discretionary accounting accrual adjustments predict abnormal negative subsequent stock returns. The higher are abnormal accounting accruals during the fiscal year of the IPO, the more negative are subsequent cumulative abnormal stock returns in the one or three years subsequent to the first fiscal year-end after the IPO. A similar but weaker relation is found for abnormal stock returns cumulated immediately after the IPO with the discretionary accruals of the previous fiscal year. The relation is also stronger for discretionary working capital accruals than for discretionary total accruals. These relations hold even after normalizing for other variables used by Ritter [1991] to forecast post-IPO performance. Finally, the results indicate that during the event period under study, an investor following the trading strategies described here would have made mean excess returns of as high as 102% in the 36-months after the first fiscal year-end subsequent to the IPO.

Appendix

A.1 Calculation of Discretionary Accruals

The expected accrual for an IPO firm in a given year is estimated from a cross-sectional regression of accruals on the change in sales using an estimation sample obtained by matching all firms on Compustat with the same 2-digit SIC code and for the same fiscal year as the IPO firm. (The IPO firm is not included in the regression.)

For the expected working capital accrual for IPO firm i in year t, we ran the following OLS cross-sectional regression for all firms in the estimation sample:

$$\frac{WKA_{jt}}{TA_{j,t-1}} = a_0 \frac{1}{TA_{j,t-1}} + a_1 \frac{\Delta SALES_{jt}}{TA_{j,t-1}} + \epsilon_{jt}, \qquad j \in \text{estimation sample}, \tag{1}$$

where $\Delta SALES$ is the change in sales, and TA is total assets.

Discretionary working capital accrual, $DWKA_{it}$, for IPO firm i for year t is calculated as:

$$DWKA_{it} = \frac{WKA_{it}}{TA_{i,t-1}} - \hat{a}_0 \frac{1}{TA_{i,t-1}} - \hat{a}_1 \frac{\Delta SALES_{it}}{TA_{i,t-1}}, \tag{2}$$

where $\hat{a}_0$ and $\hat{a}_1$ are the estimated intercept and slope coefficients for IPO firm i in year t.

The discretionary total accrual, $DTAC_{it}$, for IPO firm i for year t is calculated in a similar manner except that now total accrual, TAC, is used and the regression includes gross property, plant and equipment as an additional explanatory variable.

$$\frac{TAC_{jt}}{TA_{j,t-1}} = b_0 \frac{1}{TA_{j,t-1}} + b_1 \frac{\Delta SALES_{jt}}{TA_{j,t-1}} + b_2 \frac{PPE_{jt}}{TA_{j,t-1}} + \epsilon_{jt}, \quad j \in \text{estimation sample}, \tag{3}$$

$$DTAC_{it} = \frac{TAC_{it}}{TA_{i,t-1}} - \hat{b}_0 \frac{1}{TA_{i,t-1}} - \hat{b}_1 \frac{\Delta SALES_{it}}{TA_{i,t-1}} - \hat{b}_2 \frac{PPE_{it}}{TA_{i,t-1}} \tag{4}$$

where PPE is the gross property, plant and equipment, $\hat{b}_0$ is the estimated intercept, and $\hat{b}_1$ and $\hat{b}_2$ are the estimated slope coefficients for IPO firm i in year t.

A.2 Methods of Earnings Management

Accounting earnings that conform with GAAP can be manipulated because alternative treatments for accounting events are permitted. This section discusses briefly earnings manipulation by (1) choice of accounting methods (2) application of accounting methods, and (3) timing of asset acquisitions and dispositions; see e.g. Davidson, Stickney, and Weil [1986] for further details. The examples will show that earnings can be managed by real investment decisions in addition to pure accounting decisions.

The choice of accounting methods affects the timing of when revenues and expenses are recognized in income. Choices that advance the recognition of revenues and delays the recognition of expenses will be income-increasing. For example, the percentage-completion method permits recognizing revenues while a long-term project is underway whereas the completed contract method recognizes revenues only at completion. If input prices are falling, LIFO (last-in-first-out) costs of goods sold based on later lower prices will be lower than FIFO (first-in-first-out) costs. For depreciable assets, straight-line depreciation charges lower depreciation expenses than accelerated depreciation in the initial periods.

Even after the manager has chosen the accounting methods, there remains discretion on how the accounting principles are applied. The manager has discretion in the estimates of, e.g. the service lives and salvage values of depreciable assets, lives of intangibles, uncollectible rate on accounts receivable, cost of warranty plans, the degree of completion when percentage-completion method is used, the actuarial cost basis for pension plan, and the interest rates for capitalized leases and for pension accounting. The manager also has discretion over when and how events are recognized as accounting events requiring disclosure in the financial statements. For example, he has discretion over when and how much to write-off bad loans and impaired assets, and on the estimates of market values in the application of lower of cost or market for inventory. He decides intent in the application of marked-to-market accounting for investments to affect the recognition of unrealized holding gains and losses. Furthermore, he decides how events

are classified. For example, an event may be recognized as a contingent liability even though the likelihood of the future event may be probable, thus avoiding recognition of an expense in the income statement. He may also classify an indirect cost as a product cost rather than a period expense to avoid showing the expenditure as an expense in the income statement.

The timing asset acquisitions and dispositions can affect accounting earnings are as follows. The manager can choose when and how much to invest in R & D, advertising, and maintenance costs, all three of which are recognized as expenses in the period when the costs are incurred. The manager also decides the timing of the sale of property, plant and equipment to accelerate or delay recognition of gain or loss. The manager can accelerate or delay shipments of merchandise to customers at the end of a period to affect the timing of revenues. Finally, the manager's own compensation schedule can be altered to affect when compensation expenses are recognized in income.

REFERENCES

Aharony, Joseph, Chan-Jane Lin, and Martin Loeb. "Initial Public Offerings, Accounting Choices, and Earnings Management" *Contemporary Accounting Research* 10, Fall 1993: 61-81.

Belsley, D.A., E. Kuh, and R.E. Welsch. *Regression Diagnostics: Identifying Influencial Data and Sources of Collinearity.* John Wiley and Sons, New York, New York, 1980.

Buser, S. and K.C. Chan. "Nasdaq/NMS qualification standards, Ohio registration experience and the price performance of initial public offerings." 1987, Columbus, Ohio, Department of Commerce and National Association of Securities Dealers, Inc.

Davidson, S., C. Stickney, and R. Weil. *Accounting: the Language of Business.* Thomas Horton and Daughters, Sun Lakes, Arizona, 1986.

DeAngelo, L. "Accounting Numbers as Market Valuation Substitues: A Study of Management Buyouts of Public Shareholders." *Accounting Review* Vol 66, 1986: 400-420.

DeFond, Mark L., and James Jiambalvo. "Debt Covenant Violation and Manipulation of Accruals." *Journal of Accounting and Economics* 1994.

Degeorge, Francois and Richard Zeckhauser "The Reverse LBO Decision and Firm Performance: Theory and Evidence." *Journal of Finance* Vol 68, September 1993: 1323-1348.

Friedlan, John M. "Accounting Choices by Issuers of Initial Public Offerings." Working Paper, July 1992, York University, Ontario, Canada.

Guenther D.A. "Earnings Management in Response to Corporate Tax Rate Changes: Evidence from the 1986 Tax Reform Act." *Accounting Review* Vol 69, January 1994: 230-243.

Healy, Paul. "The Effect of Bonus Schemes on Accounting Choices." *Journal of Accounting and Economics* 7, 1985: 85-107.

Ibbotson, Roger G. "Price Performance of Common Stock New Issues, *Journal of Financial Economics*, 2, September 1975: 235-272.

Ibbotson, Roger G. and Jay Ritter. "Initial Public Offerings." in *Handbook of Operations Research and Management Science*, R.A. Jarrow, V. Maksimovic, and W.T. Ziemba (eds), North Holland, 1994.

Jones, Jennifer. "Earnings Management during Import Relief Investigation." *Journal of Accounting Research* Vol 29 No. 2, Autumn 1991: 193-228.

Klein, April "The Association Between the Information Contained in the Prospectus and the Price of Initial Public Offerings." Working Paper, 1992. New York University, New York.

Kreutzfeldt, R., and Wanda Wallace. "Error Characteristics in Audit Populations: Their Profile and Relationship to Environmental Factors." *Auditing: A Journal of Practice and Theory* Vol 6, 20-43.

Lakonishok, Josef, Andrei Shleifer, and Robert Vishny. "Contrarian investment, extrapolation, and risk." University of Illinois, Working Paper, 1993.

Loughran, Tim, and Jay Ritter. "The Timing and Subsequent Performance of New Issues: Implications for the Cost of Equity Capital." Working Paper, September 1993, University of Iowa and University of Illinois at Urbana-Champaign.

McNichols, M. and P. Wilson. "Evidence of Earnings Management from the Provision of Bad Debts." *Journal of Accounting Research* Vol 26 Supplement [1988]: 1-31.

Moyer, Susan. "Capital Adequacy Ratio Regulations and Accounting Choices in Commercial Banks." *Journal of Accounting and Economics* 13, July 1990: 123-154.

Narayanan, M. P. "Managerial Incentives for Short-term Results." *The Journal of Finance* Vol. XL (December 1985) :pp. 1469-1484

Rao, Gita R. "The Relation between Stock Returns and Earnings: A Study of Newly-Public Firms." Working Paper, April 1993, Kidder Peabody and Co., New York.

Ritter, Jay. "The Long-Run Performance of Initial Public Offerings." *Journal of Finance* Vol 66, March 1991: 3-27.

Schipper, K. "Commentary on Earnings Management." *Accounting Horizons* Vol 3 No 4 [December 1989]: 91-106.

Stein, Jeremy C. "Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior." *Quarterly Journal of Economics*, 1989:pp. 655-669.

Stern, Richard, and Paul Borstein. "Why New Issues Are Lousy Investments." *Forbes* 1985, Vol 136: 159-190.

Stoll, Hans, and Anthony Curley. "Small Business and the New Issues Market for Equities." *Journal of Financial and Quantitative Analysis* 1970, Vol 5: 309-322.

Teoh, Siew Hong, Gita R. Rao, and T.J. Wong "An Empirical Analysis of the Incentives for Earnings Management During Initial Public Offerings." Working Paper, November 1993, AGSM, University of California-Los Angeles.

TABLE 1: Initial Public Offering Sample Characteristics

Panel A: Descriptive Statistics of Sample

	Offer Price $	Size of Offering $m	Market Value[a] $m	Book Value[b] $m	Sales Revenue $m	%ΔSales Revenue[c] $m
Mean	12.547	24.542	89.197	7.243	47.102	1.059
Median	12.000	13.000	47.251	3.960	14.521	0.669
StdDev	5.962	55.393	136.978	8.644	92.290	1.585
Number	111	111	111	111	111	106

Panel B: Industry Distribution of Sample

Industry Name	SIC Codes	Frequency	%	Cumulative Frequency	Cumulative %
Oil & Gas	13	4	3.6	4	3.6
Chemical Products	28	8	7.2	12	10.8
Manufacturing	30,31,33,34	7	6.3	19	17.1
Machinery (oil&gas, computer)	35	25	22.5	44	39.6
Electronic Equipment	36	13	11.7	57	51.3
Scientific Instruments	38	6	5.4	63	56.7
Apparel	56	4	3.6	67	60.3
Computer Services	73	12	10.8	79	71.1
All other[d]	16,20,22,25, 37,39,45,48, 49,50,51,52,54, 55,58,59,78,80	32	28.8	111	100.0

Panel C: Time Distribution of Sample

IPO Year	Frequency	%	Cumulative Frequency	Cumulative %
80	20	18.0	20	18.0
81	16	14.4	36	32.4
82	2	1.8	38	34.2
83	68	61.3	106	95.5
84	5	4.5	111	100.0

[a] Market Value = number of shares outstanding x stock price on day of IPO

[b] Book Value = shareholder equity value in the fiscal year before the IPO

[c] % Δ Sales = the change in sales in the fiscal year before the IPO deflated by sales in year -2.

[d] Each of the SIC codes listed in the all other group contain 3 or fewer IPOs (less than 3%).

TABLE 2: OLS regression of three-year stock returns beginning fiscal year 1 of the IPO on fiscal year 0 discretionary accruals

Panel A: Regression of Stock Returns on Discretionary Working Capital Accruals

$LCR3(FYR1)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDWKA_0$
$Parameter Estimates$	−0.066	1.178	−0.986	−0.360	−0.068	0.012	−0.080
$T for H0 : Parameter = 0$	−0.165	2.071	−2.043	−2.223	−0.643	0.401	−2.177
$Prob > \|T\|$	0.869	0.041	0.044	0.028	0.522	0.690	0.032

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2-value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	111	0.159	4.476	0.0005	25.951	0.466	0.968	0.082

Summary Statistics	$LCR3(FYR1)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDWKA_0$
Mean	−0.006	0.395	0.093	0.541	6.630	2.228	0.592
Median	−0.128	0.377	0.019	1.000	8.650	2.303	0.405
StdDev	0.884	0.142	0.171	0.501	2.659	0.758	2.128

Panel B: Regression of Stock Returns on Discretionary Total Accruals

$LCR3(FYR1)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDTAC_0$
$Parameter Estimates$	−0.127	1.150	−1.078	−0.374	−0.057	0.015	−0.021
$T for H0 : Parameter = 0$	−0.034	1.947	−2.137	−2.205	−0.515	0.490	−0.589
$Prob > \|T\|$	0.762	0.054	0.035	0.030	0.607	0.625	0.557

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2-value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	109	0.120	3.452	0.004	29.358	0.295	0.960	0.015

Summary Statistics	$LCR3(FYR1)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDTAC_0$
Mean	−0.013	0.395	0.091	0.550	6.650	2.237	0.608
Median	−0.137	0.365	0.019	1.000	8.650	2.303	0.413
StdDev	0.889	0.143	0.169	0.500	2.644	0.760	2.144

$LCR3(FYR1)$ log 1 + return compounded 756 trading days (3-year holding period) from first day of fiscal year 1
$L(Mktret)$ log 1 + CRSP value-weighted market return over same holding period as $LCR3(FYR1)$, either NYSE-AMEX or NASDAQ market used depending on exchange listing of IPO
$L(1+r_1)$ log of 1 plus initial return of IPO
$Dummy$ value 1 if IPO has SIC code 13, 35, 36, 38 or 73, which are oil & gas and high-tech industries, 0 otherwise
$L(1+age)$ log of 1 + age of firm from year of founding (or 1901 whichever is later) to year of going public
$Volume$ annual volume of the IPOs in the year of issuance, divided by 100
$SDWKA_0$ standardized discretionary working capital accruals for fiscal year of IPO
$SDTAC_0$ standardized discretionary total accruals for fiscal year of IPO

TABLE 3: OLS regression of one-year stock returns beginning fiscal year 1 of the IPO on fiscal year 0 discretionary accruals

Panel A: Regression of Stock Returns on Discretionary Working Capital Accruals

$LCR1(FYR1)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDWKA_0$
$ParameterEstimates$	0.093	1.506	−0.415	−0.207	−0.087	0.019	−0.069
$TforH0 : Parameter = 0$	0.497	6.406	−1.515	−2.325	−1.493	1.148	−3.364
$Prob > \|T\|$	0.620	0.000	0.133	0.022	0.138	0.254	0.001

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2-value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	111	0.391	12.745	0.000	31.010	0.228	0.980	0.517

Summary Statistics	$LCR1(FYR1)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDWKA_0$
Mean	−0.099	0.046	0.093	0.541	6.630	2.228	0.592
Median	−0.080	0.052	0.019	1.000	8.650	2.303	0.405
StdDev	0.576	0.194	0.171	0.501	2.659	0.758	2.128

Panel B: Regression of Stock Returns on Discretionary Total Accruals

$LCR1(FYR1)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDTAC_0$
$ParameterEstimates$	0.101	1.504	−0.500	−0.231	−0.087	0.017	−0.036
$TforH0 : Parameter = 0$	0.497	6.026	−1.710	−2.423	−1.403	0.981	−1.727
$Prob > \|T\|$	0.620	0.000	0.090	0.017	0.164	0.329	0.087

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2-value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	109	0.343	10.378	0.000	24.874	0.526	0.978	0.414

Summary Statistics	$LCR1(FYR1)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDTAC_0$
Mean	−0.101	0.046	0.091	0.550	6.650	2.237	0.608
Median	−0.081	−0.008	0.019	1.000	8.650	2.303	0.413
StdDev	0.581	0.196	0.169	0.500	2.644	0.760	2.144

$LCR1(FYR1)$ log 1 + return compounded over 252 trading days (one-year holding period) from the first trading day of fiscal year 1. For definitions of other variables, see Table 2.

TABLE 4: OLS regression of three-year holding period stock returns compounded from IPO date on discretionary accruals of fiscal year -1

Panel A: Regression of Stock Returns on Discretionary Working Capital Accruals

$LCR3(IPO)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDWKA_{-1}$
$Parameter Estimates$	0.417	0.670	−1.300	−0.484	−0.088	−0.037	−0.013
$T for H0 : Parameter = 0$	0.927	1.192	−2.634	−2.904	−0.773	−1.083	−0.381
$Prob > \|T\|$	0.356	0.236	0.010	0.005	0.441	0.281	0.704

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2 - value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	107	0.148	4.074	0.001	23.962	0.578	0.977	0.349

Summary Statistics	$LCR3(IPO)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDWKA_{-1}$
Mean	−0.178	0.346	0.095	0.533	6.593	2.241	0.193
Median	−0.223	0.305	0.020	1.000	8.650	2.303	0.199
StdDev	0.899	0.165	0.173	0.501	2.678	0.727	2.351

Panel B: Regression of Stock Returns on Discretionary Total Accruals

$LCR3(IPO)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDTAC_{-1}$
$Parameter Estimates$	0.436	0.601	−1.202	−0.526	−0.078	−0.038	−0.041
$T for H0 : Parameter = 0$	0.952	1.084	−2.458	−3.114	−0.657	−1.111	−1.848
$Prob > \|T\|$	0.343	0.281	0.016	0.002	0.513	0.269	0.068

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2 - value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	103	0.186	4.881	0.0002	28.829	0.319	0.971	0.153

Summary Statistics	$LCR3(IPO)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDTAC_{-1}$
Mean	−0.171	0.348	0.095	0.553	6.587	2.252	0.221
Median	−0.223	0.305	0.022	1.000	8.650	2.303	0.269
StdDev	0.905	0.167	0.173	0.500	2.703	0.725	2.358

$LCR3(IPO)$ log 1 + return compounded over 756 trading days (three-year holding period) from the second available return after the IPO date. For definitions of other variables, see Table 2.

TABLE 5: OLS regression of one-year holding period stock returns compounded from IPO date on discretionary accruals of fiscal year -1

Panel A: Regression of Stock Returns on Discretionary Working Capital Accruals

$LCR1(IPO)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDWKA_{-1}$
$Parameter Estimates$	0.118	1.489	−0.750	−0.172	−0.029	−0.018	−0.030
$T for H0 : Parameter = 0$	0.484	4.251	−2.341	−1.599	−0.402	−0.695	−1.301
$Prob > \|T\|$	0.629	0.000	0.021	0.113	0.689	0.489	0.196

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2-value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	107	0.322	9.377	0.0001	29.787	0.277	0.981	0.553

Summary Statistics	$LCR1(IPO)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDWKA_{-1}$
Mean	−0.344	−0.072	0.095	0.533	6.593	2.241	0.193
Median	−0.398	−0.122	0.020	1.000	8.650	2.303	0.199
StdDev	0.651	0.201	0.173	0.501	2.678	0.727	2.351

Panel B: Regression of Stock Returns on Discretionary Total Accruals

$LCR1(IPO)$ =	a_0	$+a_1 L(Mktret)$	$+a_2 L(1+r_1)$	$+a_3 Dummy$	$+a_4 L(1+age)$	$+a_5 Volume$	$+a_6 SDTAC_{-1}$
$Parameter Estimates$	−0.059	1.494	−0.540	−0.150	0.010	−0.014	−0.024
$T for H0 : Parameter = 0$	−0.235	4.232	−1.704	−1.384	0.139	−0.515	−1.672
$Prob > \|T\|$	0.815	0.000	0.092	0.170	0.890	0.608	0.098

Regression Statistics	N	$\bar{R}^2$	$F-value$	$Prob > F$	$\chi^2-value$	$Prob > \chi^2$	$W : Normal$	$Prob < W$
	103	0.307	8.542	0.0000	30.882	0.233	0.983	0.660

Summary Statistics	$LCR1(IPO)$	$L(Mktret)$	$L(1+r_1)$	$Dummy$	$Volume$	$L(1+age)$	$SDTAC_{-1}$
Mean	−0.357	−0.072	0.095	0.553	6.587	2.252	0.221
Median	−0.401	−0.121	0.022	1.000	8.650	2.303	0.269
StdDev	0.633	0.202	0.173	0.500	2.703	0.725	2.358

$LCR1(IPO)$ log 1 + return compounded over 252 trading days (one-year holding period) from the second available return after the IPO date. For definitions of other variables, see Table 2.

TABLE 6: Mean monthly trading strategy profits and returns to a long and a short portfolio based on IPO fiscal year 0 discretionary working capital accruals from month 1 to 36 after fiscal year 0

				Exchange mkt − adjusted			*NYSE&AMEX Mkt − adjusted*		
month	$r(L)$	$r(S)$	Π_1	$r(L)$	$r(S)$	Π_2	$r(L)$	$r(S)$	Π_3
1	−0.018	−0.026	0.009	0.002	−0.014	0.016	0.010	−0.009	0.019
2	0.067	−0.020	0.088	0.062	−0.014	0.076	0.072	−0.002	0.075
3	0.036	0.021	0.015	0.022	0.015	0.007	0.032	0.024	0.007
4	−0.019	0.031	−0.051	−0.019	0.009	−0.027	−0.012	0.006	−0.018
5	0.062	−0.014	0.076	0.056	−0.005	0.061	0.061	−0.009	0.070
6	−0.026	−0.022	−0.004	−0.028	−0.033	0.005	−0.027	−0.029	0.003
7	0.009	−0.009	0.018	−0.009	−0.012	0.003	−0.007	−0.010	0.003
8	0.042	−0.006	0.048	0.010	−0.046	0.056	0.018	−0.034	0.052
9	0.014	−0.026	0.039	0.010	−0.026	0.036	0.013	−0.030	0.043
10	0.052	0.049	0.003	0.038	0.021	0.017	0.030	0.017	0.014
11	−0.011	−0.013	0.002	−0.021	−0.037	0.016	−0.016	−0.039	0.023
12	0.026	−0.006	0.032	0.011	−0.008	0.019	0.015	−0.002	0.017
13	0.092	0.071	0.022	0.065	0.042	0.023	0.048	0.029	0.020
14	0.048	−0.013	0.061	0.022	−0.028	0.050	0.022	−0.026	0.048
15	−0.014	0.069	−0.082	−0.015	0.051	−0.065	−0.011	0.056	−0.066
16	0.038	0.078	−0.040	0.026	0.055	−0.028	0.025	0.050	−0.026
17	0.048	0.007	0.041	0.028	−0.023	0.051	0.033	−0.026	0.059
18	0.052	−0.015	0.067	0.040	−0.029	0.070	0.042	−0.029	0.072
19	0.047	−0.060	0.106	0.028	−0.069	0.097	0.017	−0.076	0.092
20	0.052	0.033	0.019	0.022	0.011	0.011	0.029	0.021	0.008
21	−0.014	0.001	−0.015	−0.024	−0.006	−0.017	−0.020	−0.007	−0.013
22	0.029	−0.009	0.038	0.005	−0.036	0.041	0.000	−0.032	0.032
23	0.036	0.020	0.016	−0.008	−0.013	0.005	−0.009	−0.018	0.009
24	0.007	−0.003	0.010	−0.015	−0.011	−0.004	−0.014	−0.007	−0.007
25	0.023	0.039	−0.016	0.016	0.019	−0.003	0.008	0.014	−0.006
26	−0.017	0.023	−0.041	−0.047	−0.006	−0.041	−0.046	−0.001	−0.045
27	0.006	0.011	−0.005	0.001	−0.006	0.007	0.006	−0.001	0.008
28	0.053	0.021	0.032	0.031	−0.015	0.046	0.031	−0.014	0.045
29	0.021	0.037	−0.016	−0.004	0.025	−0.029	−0.001	0.025	−0.027
30	0.026	−0.007	0.033	0.026	−0.024	0.050	0.030	−0.020	0.050
31	−0.027	0.024	−0.051	−0.048	0.027	−0.075	−0.034	0.041	−0.076
32	0.056	0.047	0.009	0.024	0.022	0.003	0.031	0.038	−0.006
33	−0.034	−0.027	−0.007	−0.037	−0.021	−0.016	−0.035	−0.014	−0.021
34	0.052	0.026	0.026	0.031	0.009	0.022	0.035	0.020	0.015
35	−0.011	−0.041	0.031	−0.025	−0.054	0.029	−0.014	−0.039	0.025
36	−0.000	−0.008	0.007	−0.018	−0.008	−0.010	−0.008	−0.001	−0.007
Mean	0.022	0.008	0.014	0.007	−0.007	0.014	0.010	−0.004	0.014
$T-test\ p-value$	0.000	0.146	0.036	0.142	0.162	0.034	0.039	0.434	0.039
Median	0.026	−0.001	0.015	0.010	−0.010	0.013	0.011	−0.007	0.011
$Signrank\ p-value$	0.000	0.231	0.027	0.129	0.156	0.024	0.050	0.322	0.032
$No. > 0$	25	18	25	22	12	25	22	12	24

Firms are sorted by fiscal year 0 discretionary working capital accruals into quintile groups. L (S) portfolio contains IPOs in quintile with the smallest (largest) discretionary accruals. r(L) is the mean daily compounded monthly return from investing in portfolio (L), and r(S) is the equivalent for portfolio (S). The exchange-market adjusted returns are based on the value-weighted market indexes of the exchange where the IPO is traded. Π_1 is the profit to a zero investment portfolio by going long \$1 in portfolio L and going short \$1 in portfolio S. Π_2 and Π_3 are market-adjusted profits to the same trading strategy.

TABLE 7: Mean monthly trading strategy profits and returns to a long and a short portfolio based on firm size and IPO fiscal year 0 discretionary working capital accruals from month 1 to 36 after fiscal year 0

				Exchange mkt − adjusted			*NYSE&AMEX Mkt − adjusted*		
month	$r(L)$	$r(S)$	Π_1	$r(L)$	$r(S)$	Π_2	$r(L)$	$r(S)$	Π_3
1	−0.011	−0.040	0.029	−0.001	−0.035	0.034	0.003	−0.023	0.026
2	0.048	−0.023	0.071	0.044	−0.016	0.060	0.056	−0.006	0.062
3	0.000	−0.008	0.008	−0.010	−0.020	0.010	−0.002	−0.009	0.006
4	0.002	0.044	−0.042	0.001	0.038	−0.037	0.005	0.040	−0.035
5	0.023	−0.030	0.053	0.022	−0.030	0.052	0.025	−0.026	0.050
6	−0.030	−0.022	−0.008	−0.035	−0.028	−0.007	−0.029	−0.027	−0.002
7	0.016	−0.007	0.024	−0.003	−0.017	0.014	−0.002	−0.009	0.007
8	0.044	−0.012	0.057	0.010	−0.048	0.057	0.015	−0.042	0.057
9	−0.015	0.006	−0.021	−0.018	0.004	−0.023	−0.016	0.007	−0.024
10	0.040	0.020	0.020	0.023	−0.000	0.023	0.018	−0.004	0.022
11	0.021	−0.026	0.048	0.006	−0.045	0.051	0.010	−0.042	0.052
12	0.029	0.013	0.016	0.011	0.004	0.007	0.011	0.007	0.004
13	0.081	0.059	0.021	0.052	0.028	0.024	0.035	0.015	0.020
14	0.024	−0.024	0.049	0.001	−0.043	0.044	0.001	−0.043	0.044
15	−0.014	−0.008	−0.005	−0.026	−0.016	−0.010	−0.022	−0.012	−0.010
16	0.047	0.067	−0.019	0.033	0.047	−0.014	0.028	0.043	−0.015
17	0.040	0.011	0.029	0.009	−0.010	0.019	0.011	−0.005	0.016
18	0.023	−0.019	0.042	0.005	−0.034	0.039	0.006	−0.035	0.041
19	0.015	−0.016	0.031	0.001	−0.027	0.028	−0.005	−0.034	0.029
20	0.025	0.031	−0.005	0.001	0.004	−0.002	0.008	0.011	−0.003
21	−0.005	0.013	−0.017	−0.011	0.005	−0.016	−0.006	0.006	−0.012
22	0.021	0.055	−0.034	−0.000	0.021	−0.021	0.001	0.017	−0.016
23	0.030	0.064	−0.033	−0.009	0.024	−0.033	−0.010	0.021	−0.030
24	0.026	0.010	0.016	0.013	−0.008	0.021	0.015	−0.005	0.020
25	0.025	0.061	−0.036	0.009	0.042	−0.033	0.007	0.033	−0.026
26	0.010	0.054	−0.044	−0.023	0.022	−0.045	−0.019	0.029	−0.048
27	0.017	0.031	−0.014	0.007	0.009	−0.002	0.012	0.008	0.004
28	0.041	−0.015	0.056	0.021	−0.035	0.056	0.021	−0.033	0.054
29	0.024	−0.005	0.029	0.004	−0.034	0.038	0.006	−0.032	0.038
30	0.001	−0.041	0.042	−0.005	−0.040	0.035	0.002	−0.034	0.036
31	−0.032	0.032	−0.064	−0.047	0.024	−0.070	−0.033	0.037	−0.070
32	0.016	0.029	−0.012	−0.007	−0.002	−0.005	0.000	0.016	−0.016
33	−0.011	−0.028	0.017	−0.009	−0.019	0.009	−0.004	−0.015	0.012
34	−0.002	0.022	−0.024	−0.015	−0.006	−0.009	−0.004	0.005	−0.009
35	−0.031	0.004	−0.035	−0.043	−0.012	−0.031	−0.035	−0.004	−0.031
36	0.024	−0.007	0.031	0.003	−0.015	0.018	0.008	−0.004	0.012
Mean	0.016	0.008	0.008	0.000	−0.007	0.008	0.003	−0.004	0.007
T − test p − value	0.004	0.134	0.195	0.920	0.091	0.156	0.295	0.328	0.176
Median	0.021	0.005	0.016	0.001	−0.011	0.010	0.004	−0.005	0.007
Signrank p − value	0.001	0.238	0.202	0.806	0.093	0.146	0.180	0.404	0.170
No. > 0	27	19	20	20	13	20	23	15	21

Firms are sorted by firm size on IPO date. For each contiguous pair, the firm with the smaller discretionary working capital accruals is assigned to portfolio L, and the other to portfolio S. r(L) is the mean daily compounded monthly return of portfolio (L), and r(S) is the equivalent for portfolio (S). The exchange-market adjusted returns are based on the value-weighted market indexes of the exchange where the IPO is traded. Π_1 is the profit to a zero investment portfolio by going long \$1 in portfolio L and going short \$1 in portfolio S. Π_2 and Π_3 are market-adjusted profits to the same trading strategy.

TABLE 8: Distribution of returns to investing in portfolio of IPOs selected based on fiscal year 0 discretionary working capital accruals; Median monthly returns from month 1 to 36 after fiscal year 0

				Exchange			*NYSE&AMEX*		
				mkt − adjusted			*mkt − adjusted*		
month	$r(L)$	$r(S)$	$r(L)-r(S)$	$r(L)$	$r(S)$	$r(L)-r(S)$	$r(L)$	$r(S)$	$r(L)-r(S)$
1	−0.049	−0.041	−0.008	−0.036	−0.030	−0.006	−0.019	−0.006	−0.013
2	0.047	−0.007	0.054	0.078	0.004	0.074	0.074	0.022	0.052
3	0.035	0.000	0.035	0.029	−0.014	0.043	0.036	−0.024	0.060
4	−0.027	0.026	−0.053	−0.017	−0.006	−0.011	−0.002	−0.003	0.001
5	0.046	−0.017	0.063	0.056	0.000	0.056	0.063	0.007	0.056
6	−0.006	−0.005	−0.001	−0.014	−0.011	−0.002	0.002	−0.034	0.036
7	−0.017	0.000	−0.017	−0.031	−0.004	−0.027	−0.012	0.011	−0.023
8	0.054	0.013	0.041	−0.012	−0.050	0.038	−0.003	−0.033	0.031
9	0.005	−0.019	0.024	−0.006	0.000	−0.006	0.002	−0.005	0.007
10	0.008	0.022	−0.015	0.002	0.017	−0.016	0.007	0.017	−0.010
11	0.038	0.000	0.038	0.014	−0.048	0.062	0.019	−0.033	0.052
12	0.006	−0.022	0.028	0.004	−0.003	0.007	0.015	0.009	0.006
13	0.097	0.029	0.068	0.046	0.022	0.024	0.010	0.033	−0.024
14	0.008	−0.054	0.062	0.012	−0.071	0.083	0.015	−0.037	0.052
15	0.008	0.023	−0.015	0.000	−0.020	0.020	0.006	−0.033	0.039
16	0.049	0.100	−0.052	0.012	0.053	−0.041	0.017	0.025	−0.008
17	0.061	0.000	0.061	0.043	−0.050	0.093	0.010	−0.064	0.074
18	0.014	0.000	0.014	0.014	−0.025	0.039	0.018	−0.039	0.057
19	0.024	−0.007	0.031	0.039	−0.033	0.071	0.026	−0.026	0.052
20	0.041	−0.018	0.059	0.015	−0.019	0.034	0.012	−0.009	0.021
21	−0.012	−0.034	0.023	0.001	−0.034	0.035	0.003	−0.031	0.034
22	0.032	−0.032	0.064	−0.004	−0.054	0.050	−0.006	−0.044	0.039
23	0.024	−0.015	0.039	−0.020	−0.032	0.013	−0.011	−0.029	0.018
24	0.021	0.000	0.021	0.012	−0.005	0.017	0.004	−0.008	0.012
25	0.008	0.031	−0.024	0.015	0.035	−0.021	−0.001	0.012	−0.013
26	0.017	0.000	0.017	−0.001	0.007	−0.008	−0.016	0.011	−0.027
27	0.000	0.000	0.000	0.012	0.000	0.012	0.013	0.002	0.011
28	0.021	0.000	0.021	0.009	0.000	0.009	0.009	−0.026	0.035
29	−0.019	0.000	−0.019	−0.044	0.000	−0.044	−0.039	0.000	−0.039
30	0.010	0.000	0.010	−0.008	−0.018	0.011	−0.003	−0.013	0.010
31	−0.041	0.017	−0.058	−0.030	0.019	−0.049	−0.026	0.038	−0.064
32	0.022	−0.008	0.030	0.019	−0.018	0.037	0.043	−0.007	0.050
33	−0.017	−0.078	0.061	−0.018	−0.046	0.028	−0.011	−0.036	0.026
34	0.030	0.000	0.030	0.011	−0.026	0.037	0.026	−0.011	0.037
35	−0.008	−0.054	0.046	−0.039	−0.050	0.012	−0.003	−0.048	0.045
36	0.000	−0.013	0.013	−0.004	0.000	−0.004	−0.007	0.000	−0.007
Mean	0.015	−0.005	0.019	0.004	−0.014	0.019	0.007	−0.011	0.019
$T-test\ p-value$	0.005	0.368	0.002	0.325	0.003	0.003	0.050	0.008	0.001
Median	0.012	0.000	0.023	0.003	−0.013	0.015	0.005	−0.009	0.023
$Signrank\ p-value$	0.005	0.293	0.001	0.411	0.003	0.004	0.062	0.011	0.002
$No. > 0$	25	8	25	20	7	24	22	11	26

Firms are sorted by their fiscal year 0 discretionary working capital accruals into quintile groups. L (S) portfolio contains IPOs in quintile with the smallest (largest) discretionary accruals. r(L) is the daily compounded monthly median return of portfolio (L), and r(S) is the equivalent for portfolio (S). The market-adjusted returns are based on the relevant value-weighted market indexes.

TABLE 9: Distribution of returns to investing in portfolio of IPOs selected based on firm size and fiscal year 0 discretionary working capital accruals; Median monthly returns from month 1 to 36 after fiscal year 0

				Exchange			*NYSE&AMEX*		
				mkt − adjusted			*mkt − adjusted*		
month	$r(L)$	$r(S)$	$r(L)-r(S)$	$r(L)$	$r(S)$	$r(L)-r(S)$	$r(L)$	$r(S)$	$r(L)-r(S)$
1	−0.030	−0.047	0.017	−0.017	−0.042	0.025	−0.011	−0.029	0.018
2	0.024	−0.018	0.042	0.052	−0.015	0.067	0.064	−0.010	0.074
3	0.000	−0.024	0.024	−0.011	−0.051	0.040	−0.004	−0.043	0.039
4	0.000	0.000	0.000	−0.012	0.018	−0.030	0.000	0.031	−0.031
5	0.013	−0.031	0.044	0.006	−0.008	0.014	0.013	−0.004	0.017
6	−0.011	−0.026	0.015	−0.018	−0.032	0.014	−0.009	−0.032	0.023
7	−0.015	−0.025	0.010	−0.019	−0.018	−0.001	−0.005	−0.001	−0.004
8	0.041	−0.010	0.051	0.001	−0.056	0.057	0.010	−0.051	0.062
9	−0.014	−0.034	0.020	−0.040	−0.035	−0.005	−0.024	−0.030	0.006
10	0.000	−0.008	0.008	−0.007	−0.026	0.019	−0.003	−0.025	0.022
11	0.000	−0.040	0.040	−0.007	−0.053	0.046	−0.005	−0.048	0.043
12	0.017	−0.008	0.025	0.000	−0.013	0.013	−0.001	−0.018	0.017
13	0.061	0.044	0.017	0.039	0.015	0.025	0.012	−0.003	0.015
14	0.000	−0.012	0.012	−0.014	−0.047	0.033	−0.026	−0.040	0.014
15	0.000	−0.041	0.041	−0.029	−0.040	0.010	−0.011	−0.056	0.045
16	0.026	0.062	−0.036	0.011	0.051	−0.040	0.008	0.034	−0.026
17	0.016	0.000	0.016	0.000	−0.032	0.032	0.004	−0.024	0.028
18	0.000	−0.029	0.029	0.000	−0.025	0.025	0.000	−0.025	0.025
19	0.012	−0.010	0.022	0.000	−0.036	0.036	0.000	−0.045	0.045
20	−0.008	−0.016	0.008	−0.027	−0.028	0.001	−0.014	−0.012	−0.002
21	−0.016	−0.020	0.004	−0.018	−0.021	0.003	−0.014	−0.017	0.004
22	0.000	0.027	−0.027	−0.008	−0.013	0.005	−0.011	−0.016	0.005
23	0.010	0.008	0.002	−0.013	−0.028	0.015	−0.015	−0.023	0.008
24	0.020	0.004	0.017	0.027	−0.010	0.037	0.030	−0.018	0.048
25	0.009	0.051	−0.042	−0.003	0.035	−0.038	−0.002	0.033	−0.035
26	0.019	0.000	0.019	−0.008	0.005	−0.013	−0.022	0.013	−0.035
27	0.014	0.022	−0.008	0.007	0.012	−0.005	0.019	0.005	0.014
28	0.027	0.000	0.027	0.004	−0.035	0.039	0.001	−0.026	0.027
29	0.000	−0.016	0.016	−0.043	−0.028	−0.016	−0.042	−0.028	−0.014
30	−0.013	−0.030	0.017	−0.015	−0.016	0.001	−0.005	−0.008	0.003
31	−0.048	0.017	−0.064	−0.046	−0.005	−0.041	−0.034	0.024	−0.058
32	−0.008	0.000	−0.008	−0.008	−0.028	0.019	−0.007	0.004	−0.011
33	−0.010	−0.053	0.043	0.000	−0.035	0.035	0.000	−0.033	0.033
34	0.000	0.000	0.000	−0.019	−0.032	0.013	−0.004	−0.027	0.023
35	−0.030	−0.018	−0.012	−0.039	−0.041	0.001	−0.029	−0.032	0.003
36	0.018	−0.031	0.049	0.000	−0.027	0.027	0.000	−0.013	0.013
Mean	0.003	−0.009	0.012	−0.008	−0.020	0.013	−0.004	−0.016	0.013
$T-test\ p-value$	0.318	0.057	0.008	0.032	0.000	0.005	0.227	0.000	0.010
Median	0.000	−0.011	0.016	−0.008	−0.027	0.014	−0.004	−0.020	0.015
$Signrank\ p-value$	0.235	0.033	0.003	0.006	0.000	0.005	0.060	0.000	0.005
$No. > 0$	15	8	27	8	6	27	9	7	27

Firms are sorted by firm size (market capitalization on the IPO date). For each contiguous pair, the firm with the smaller discretionary working capital accruals is assigned to the L portfolio, and the other to the S portfolio. r(L) is the median daily compounded monthly return of portfolio (L), and r(S) is the equivalent for portfolio (S). The market-adjusted returns are based on the relevant value-weighted market indexes.

TABLE 10: Cumulative holding period returns to trading strategy based on IPO fiscal year 0 discretionary working capital accruals and distribution of holding period returns and portfolio characteristics

Holding period					*Exchange mkt − adjusted*			*NYSE&AMEX mkt − adjusted*		
		$cr(L)$	$cr(S)$	$p-value^*$	$cr(L)$	$cr(S)$	$p-value$	$cr(L)$	$cr(S)$	$p-value$
3	*mean*	0.084	0.001	0.452	0.088	0.015	0.516	0.118	0.039	0.469
	median	0.020	−0.111	0.008	0.048	−0.112	0.023	0.083	−0.057	0.030
6	*mean*	0.138	−0.027	0.253	0.135	−0.044	0.202	0.175	−0.020	0.146
	median	−0.027	−0.114	0.184	−0.036	−0.125	0.149	0.055	−0.113	0.137
9	*mean*	0.224	−0.060	0.109	0.141	−0.135	0.055	0.201	−0.110	0.027
	median	0.084	−0.091	0.066	0.053	−0.249	0.038	0.090	−0.230	0.022
12	*mean*	0.408	−0.023	0.144	0.221	−0.162	0.072	0.268	−0.141	0.038
	median	0.115	−0.270	0.048	−0.017	−0.324	0.013	0.030	−0.294	0.010
24	*mean*	1.018	0.085	0.020	0.418	−0.236	0.015	0.471	−0.200	0.015
	median	0.655	−0.251	0.006	0.195	−0.479	0.004	0.195	−0.484	0.002
36	*mean*	1.255	0.228	0.044	0.341	−0.281	0.034	0.489	−0.170	0.049
	median	0.678	−0.157	0.012	−0.019	−0.513	0.017	−0.025	−0.383	0.017
		$Size(L)$	$Size(S)$	$p-value$	$B/M(L)$	$B/M(S)$	$p-value$	$\beta(L)$	$\beta(S)$	$p-value$
3	*mean*	86.038	83.665	0.942	0.364	0.386	0.553	1.042	1.144	0.752
	median	41.331	43.243	0.937	0.346	0.397	0.433	0.636	1.300	0.312
6	*mean*	86.038	83.665	0.942	0.364	0.386	0.553	1.042	1.144	0.752
	median	41.331	43.243	0.937	0.346	0.397	0.433	0.636	1.300	0.312
9	*mean*	88.635	83.665	0.881	0.365	0.386	0.570	1.069	1.144	0.823
	median	50.661	43.243	0.999	0.335	0.397	0.466	0.656	1.300	0.385
12	*mean*	88.635	83.665	0.881	0.365	0.386	0.570	1.069	1.144	0.823
	median	50.661	43.243	0.999	0.335	0.397	0.466	0.656	1.300	0.385
24	*mean*	88.635	87.084	0.963	0.365	0.394	0.439	1.069	1.222	0.643
	median	50.661	44.307	0.799	0.335	0.398	0.338	0.656	1.341	0.259
36	*mean*	88.635	87.084	0.963	0.365	0.394	0.439	1.069	1.222	0.643
	median	50.661	44.307	0.799	0.335	0.398	0.338	0.656	1.341	0.259

Firms are sorted by their fiscal year 0 discretionary working capital accruals into quintile groups. L portfolio contains IPOs in quintile 5 with the smallest discretionary accruals and S portfolio contains IPOs in quintile 1 with the largest discretionary accruals. cr(L) is the daily compounded return over the holding period of portfolio (L), and r(S) is the equivalent for portfolio (S). The market-adjusted returns are based on the relevant value-weighted market indexes. Size is firm market capitalization at the IPO date. B/M is the book value of equity to market capitalization ratio. β is the Scholes-Williams beta estimated for fiscal year 0. * p-values are for the $t-statistic$ for difference in means and for the Wilcoxon signed rank test for differences in medians between L and S portfolios.

TABLE 11: Cumulative holding period returns to trading strategy based on firm size and IPO fiscal year 0 discretionary working capital accruals and distribution of holding period returns and portfolio characteristics

Holding period					*Exchange mkt − adjusted*			*NYSE&AMEX market − adjusted*		
		$cr(L)$	$cr(S)$	$p-value^*$	$cr(L)$	$cr(S)$	$p-value$	$cr(L)$	$cr(S)$	$p-value$
3	*mean*	0.038	−0.060	0.088	0.037	−0.058	0.096	0.060	−0.027	0.117
	median	−0.041	−0.147	0.001	−0.034	−0.122	0.003	−0.004	−0.083	0.008
6	*mean*	0.056	−0.081	0.078	0.042	−0.094	0.057	0.078	−0.057	0.055
	median	−0.058	−0.103	0.079	−0.044	−0.127	0.060	0.008	−0.090	0.060
9	*mean*	0.113	−0.109	0.017	0.036	−0.170	0.008	0.083	−0.122	0.008
	median	0.065	−0.172	0.015	0.003	−0.245	0.010	0.086	−0.173	0.015
12	*mean*	0.308	−0.139	0.096	0.127	−0.234	0.002	0.166	−0.183	0.001
	median	0.085	−0.226	0.004	0.011	−0.289	0.002	0.024	−0.230	0.002
24	*mean*	0.701	0.040	0.002	0.190	−0.262	0.002	0.235	−0.216	0.003
	median	0.280	−0.191	0.001	−0.070	−0.440	0.001	−0.070	−0.398	0.001
36	*mean*	0.833	0.130	0.010	0.087	−0.344	0.007	0.219	−0.233	0.014
	median	0.279	−0.175	0.016	−0.210	−0.498	0.011	−0.160	−0.425	0.018
		$Size(L)$	$Size(S)$	$p-value$	$B/M(L)$	$B/M(S)$	$p-value$	$\beta(L)$	$\beta(S)$	$p-value$
3	*mean*	80.348	97.888	0.501	0.422	0.398	0.568	1.110	1.079	0.854
	median	47.251	47.130	0.871	0.391	0.395	0.965	1.014	1.222	0.579
6	*mean*	80.348	97.888	0.501	0.422	0.398	0.568	1.110	1.079	0.854
	median	47.251	47.130	0.871	0.391	0.395	0.965	1.014	1.222	0.579
9	*mean*	81.253	97.888	0.525	0.423	0.398	0.554	1.121	1.079	0.799
	median	47.698	47.130	0.907	0.393	0.395	0.999	1.014	1.222	0.645
12	*mean*	81.253	97.888	0.525	0.423	0.398	0.554	1.121	1.079	0.799
	median	47.698	47.130	0.907	0.393	0.395	0.999	1.014	1.222	0.645
24	*mean*	81.253	99.515	0.490	0.423	0.401	0.608	1.121	1.109	0.939
	median	47.698	48.889	0.787	0.393	0.397	0.892	1.014	1.254	0.533
36	*mean*	82.254	99.515	0.516	0.426	0.401	0.555	1.130	1.109	0.570
	median	48.144	48.889	0.835	0.394	0.397	0.995	1.015	1.254	0.899

Firms are sorted by firm size (market capitalization on the IPO date). For each contiguous pair, the firm with the smaller discretionary working capital accruals is assigned to portfolio L, and the larger in the pair to portfolio S. cr(L) is the daily compounded return over the holding period of portfolio (L), and r(S) is the equivalent for portfolio (S). The market-adjusted returns are based on the relevant value-weighted market indexes. Size is firm market capitalization at the IPO date. B/M is the book value of equity to market capitalization ratio. β is the Scholes-Williams beta estimated for fiscal year 0. * p-values are for the $t-statistic$ for difference in means and for the Wilcoxon signed rank test for differences in medians between L and S portfolios.