Disclosure, Institutional Investors And Pricing The Discretionary Accruals

Jerry Chen[1]

（1.Hang Seng Management College）

Abstract：This paper examines the impact of public disclosure level on market pricing of discretionary accruals of firms with high or low institutional ownership. Using Mishkin test (1983) and hedge portfolio test, this paper documents that for firms with low institutional ownership, the mispricing of discretionary accruals is less severe for firms with higher level of disclosure; for firms with high institutional ownership, there is no significant difference of market pricing of discretionary accruals between high and low disclosure level. The results are robust to alternative accrual measure under indirect balance sheet approach and alternative disclosure measure on a composite basis which includes the annual reports, the regulatory-driven 10-K and proxy statements.

Key words：Disclosure；Institutional Investors；Discretionary Accruals

I. Introduction

This paper examines the effect of disclosure on market efficiency, namely whether increase in public disclosure level will help investors (non-institutional as well as institutional) more correctly assess the persistence of discretionary accruals. This paper believes that there are many factors that may contribute to the accrual mispricing problem and tries to provide insight on one of them, public disclosure. Xie (2001) suggests that investors may benefit from disclosures that help them assess the persistence of accrual. Hibra (2000) finds that the market does not materially misprice those transitory accrual items that financial reports make relatively visible. These evidence shows that appropriate disclosure may help the market correctly assess the persistence of accrual information. However, there is currently little direct evidence on the role of disclosure on pricing of accruals. It is still not clear whether public disclosure can help market more correctly price the discretionary accruals and whether the role of disclosure is different between institutional investors and non-institutional investors. This paper tries to answer these questions.

Numerous studies have examined associations between market returns and earning components. Generally researchers find that earnings and its accrual components have information contents and are priced by market (Dechow, 1994 and Subramanyam, 1996). Sloan (1996) documents that earnings are overpriced by market and Xie (2001) further finds that the overprice of earnings is mainly attributed to the overprice of discretionary accruals. Xie (2001) attributes any market mispricing of discretionary accruals to the market's failure to correctly assess the persistence of these accruals. Based on these evidences which suggest that the market does not fully impound publicly disclosed accounting information, researchers start to find factors that may contribute to this phenomenon. Investors' inability to interpret the information correctly is one of the factors. Collins, Gong, and Hibra (2003) provide insight on this factor that may contribute to the accrual mispricing phenomena by examining the role of investor sophistication in assessing the valuation implications of accruals. They find evidence that firms with a high level of institutional ownership have stock prices that more accurately reflect the persistence of accruals. This is consistent with the belief that understanding accruals' future earnings implications requires that investors possess a reasonably high level of sophistication.

While Collins, Gong, and Hibra (2003) looks at the investor side that contribute to the accrual mispricing, this paper focuses more on the information side. This paper examines the impact of public disclosure level on market pricing of discretionary accruals of firms with high or low institutional ownership and predicts that for firms with low institutional ownership, the mispricing of discretionary accruals will be less severe for firms with higher level of disclosure; for firms with high institutional ownership, there is no significant difference of market pricing of discretionary accruals between firms with high and low disclosure level. The reason behind is that as Collins, Gong, and Hibra (2003) documented, institutional investors have superior ability to interpret information and they have informational advantages such as greater access to management, the disclosure level in public documents will not affect them as much as non-institutional investors, for whom annual reports may be the only information source.

Following Sloan (1996), this paper conducts both non-linear regression-based tests (i.e., Mishkin, 1983) and hedge portfolio tests to address the above question. The regression-based test uses a non-linear system of equations that provides a statistical comparison between: (1) a measure of the market's pricing of discretionary accruals (i.e., the market's valuation coefficient on discretionary accruals) and (2) a measure of discretionary accruals' ability to predict one-year-ahead earnings (i.e., the forecasting coefficient of these accruals). The results of the Mishkin test shows that institutional investors better understand the persistence of accruals no matter the disclosure level in the public document. The results also reveal that the increase in disclosure level in public documents will increase non-institutional investors' accuracy of estimation of persistence of discretionary accruals.

In the hedge portfolio test, I use cross-sectional regressions to examine the relation between future returns and the scaled portfolio rank of discretionary accruals for firms with different disclosure level. I run the regression separately for high and low institutional ownership subsamples. The results show that in the low institutional ownership subsample, there are significant arbitrage profits from a discretionary-accrual-based trading strategy when disclosure level is low; however there is no abnormal return when disclosure level is high. In addition in the high institutional ownership subsample, there is no significant abnormal return irrespective of the disclosure level, which is consistent with the results of the Mishkin test in the previous section.

The above results are robust to alternative accrual measure under indirect balance sheet approach and alternative disclosure measure on a composite basis which includes the annual reports, the regulatory-driven 10-K and proxy statements.

This paper proceeds as follows. Section II develops hypotheses. Section III describes the sample and presents descriptive statistics. Section IV describes the test design and reports the key results. Section V reports robustness checks. I conclude the paper in Section VI. =

II. Hypothesis

There are two fundamental accounting principles guiding the generation of accounting figures: the revenue recognition principle and the matching principle. Under such principles, accruals can avoid timing and mismatching problems cash flows have and thus earnings are hypothesized to be more closely related to firm performance. Researchers find evidence that market attaches value to total accruals and discretionary accruals (Dechow (1994) and Subramanyam (1996)).However, accrual accounting is not without problem. Sloan (1996) examines the nature of the information contained in the accrual and cash flow components of earnings and the extent to which this information is reflected in stock prices. The underlying reasoning, according to Sloan (1996), is that accrual system relies on accruals, deferrals, allocations and valuations, all of which involve higher degrees of subjectivity than cash and thus they are less likely to recur in future periods' earnings. Sloan's results suggest that investors naively fixate on reported earnings, and fail to distinguish information contained in the accrual

and cash flow components of current earnings. This evidence raises the possibility that the well documented association between earnings and stock returns may in part, due to investors' naïve fixation on reported earnings.

Xie (2001) finds that the market overestimates the persistence of discretionary accruals, and consequently overprices these accruals. His paper extends Subramanyam (1996) by showing that the market not only prices, but also overprices discretionary accruals. His results also suggest that the overpricing of total accruals that Sloan (1996) found is due largely to discretionary accruals. Based on these evidences, this paper focuses on market mispricing of discretionary accruals which is the most problematic component of earnings. Xie (2001) attributes any market mispricing of discretionary accruals to the market's failure to correctly assess the persistence of these accruals.

This paper believes the failure to correctly assess the persistence of discretionary accruals is largely due to either insufficient public information available to investors or investors' inability to interpret the information correctly or both. Increase in disclosure level can help to solve the first problem to some extent. Xie (2001) suggests that investors may benefit from disclosures that help them assess the persistence of accrual. Hibra (2000) finds that the market does not materially misprice those transitory accrual items that financial reports make relatively visible, which is consistent with the notion that appropriate disclosures may help the market correctly assess the persistence of accrual information. Moreover, Collins, Gong, and Hibra (2003) find evidence that investor sophistication mitigating the accruals mispricing phenomena, but it is not clear whether the more accurate assessment of accruals persistence results from institutional investors' superior ability to interpret information contained in published financial statements or from an informational advantage such as greater access to management. Add together, these results suggest that public disclosure may help investors' understanding of the implication of discretionary accruals but the impact on different investors, namely institutional investors vs. non-institutional investors, may be different.

Non-institutional investors usually do not have extensive access to management and thus rely more on the public information, and thus in terms of more accurate interpretation the accounting figure, they may benefit more from the increase in disclosure level in such public documents, i.e. annual reports, while institutional investors, given they have access to other sources of information and superior analysis ability to see through the accounting figures, the increase in disclosure level in annual reports may not affect them as much as non-institutional investors.

The reasoning leads to the following hypothesis:

H1a: For firms with low institutional ownership, the mispricing of discretionary accruals will be less severe for firms with higher level of disclosure; for firms with high institutional ownership, there is no significant difference of market pricing of discretionary accruals between firms with high and low disclosure level.

Market mispricing of discretionary accruals implies there is opportunity for exploiting the value-relevant information in discretionary accruals. According to Sloan (1996), the mispricing will be corrected when future earnings are realized to be lower (higher) than expected, resulting in predictable negative (positive) abnormal stock returns. Thus, we expect that a discretionary accrual based trading strategy will be less profitable for firms with high disclosure level relative to firms with low disclosure level in the low institutional ownership subsample. Consequently, I hypothesize the following:

H1b: A discretionary accrual based hedge portfolio yields smaller future abnormal returns for firms with high disclosure level relative to firms with low disclosure level in the low institutional ownership subsample.

III. Sample and Descriptive Statistics

Sample and Data Sources

I obtain the disclosure score from the Standard & Poor's transparency and disclosure study (TD study hereafter), which examines the disclosure level of year 2001 of the S&P 500 constituents in the United States. Greater transparency and better disclosure keep corporate stakeholders better informed about the way a company is being managed. TD score is found to be correlated with other governance measures and that company level rankings are useful in understanding financial decision-making at the company level (Durnev and Kim, 2002). The TD study examines the companies that were members of the S&P 500 Index both on 30th June and on 30th September 2002 and it excludes companies for which there may be some regulatory inquiries relating to their public filings (Standard and Poor, 2002), so the initial sample consists of 460 S&P 500 firms.

Financial statement data are collected from the Compustat Annual Industrial and Research files. Returns data are collected from CRSP daily and monthly stock return files. I delete firms with: (1) insufficient data to estimate the extended modified Jones model as defined below; (2) missing institutional ownership data; (3) missing monthly stock returns. Following the tradition, firms from the financial service industry (SIC code 6000-6999) and utility industry (SIC code 4900-4949) are excluded from the analysis because disclosure requirements and accounting rules are significantly different from these industries. After the above adjustments, the final sample consists of 342 firm observations of year 2001.

Variable Definition and Measurement

TD study presents disclosure score based on annual reports alone as well as on a composite basis, which include, in addition to the annual reports, the regulatory-driven 10-K and proxy statements. I use the disclosure score based on annual reports alone in the hypothesis testing. According to the TD study, disclosure levels based on annual reports alone is a more discretionary form of disclosure and was much more variable (Standard and Poor, 2002).

Academic researchers have also identified annual reports as the principal communication device available to companies. Botosan (1997) states although the annual report is only one means of corporate reporting, it should serve as a good proxy for the level of voluntary disclosure provided by a firm across all disclosure avenues because annual report disclosure levels are positively correlated with the amount of disclosure provided via other media (Lang and Lundholm, 1993). So I use the final TD scores based on annual reports alone as a proxy for firm's disclosure level (DISC).

In addition, the TD study is based on the information disclosed in key public documents; it does not include all of the different types of company disclosure that may exist. This feature serves the hypothesis well, because as discussed in the previous section, institutional investors may have greater access to information in sources other than public documents and that is why this paper believes the increase in disclosure in public documents, namely annual reports, will not affect them as much as for non-institutional investors. One shortcoming of this TD score is that it focuses on disclosure but not endeavor to assess the quality of the information provided. Furthermore, the score cannot control the accuracy of disclosure and it is not meant to identify forensically any disclosure that maybe incorrect or fraudulent (Standard and Poor, 2002).

The majority of accounting studies in the literature use an indirect balance sheet approach to calculate total accruals, such as Dechow, Sloan, and Sweeney (1995), Subramanyam (1998), Sloan (1996) and Xie (2001), etc. However, in this paper, I use Hibra and Collins' (2002) cash flow approach to calculate total accruals because in their research, they find that the error induced by using a balance sheet estimation approach contaminates computations of so-called discretionary or abnormal accruals. Such error will affect three popular applied settings: (1) estimating the discretionary and nondiscretionary

component of accruals and test of earnings management; (2) the contemporaneous relation between security returns and accruals; and (3) testing for market mispricing of accruals (Hibra and Collins, 2002). The first and the third point have direct implication in this paper.

According to Hibra and Collins (2002), the total accrual is defined as follows:

TAC=EARN-CFO

Where TAC=total accrual; EARN=earnings before extraordinary items and discontinued operations (Compustat # 123); CFO=operating cash flows (from continuing operations) taken directly from the statement of cash flows (Compustat # 308- Compustat # 124). All these variables are deflated by beginning-of year total asset (TA, Compustat # 6). Institutional ownership (IS) is defined as the percent of a company's aggregate number of shares held by institutions to common shares outstanding for the latest available calendar quarter. (Compustat Mnemonic IOTSHR0)

I use CRSP monthly returns file to measure annual buy-and-hold returns (RETURN) for the 12-month period ending three months after the firm's fiscal year end. Following Sloan (1996) and Xie (2001), I calculate size-adjusted abnormal returns (SIZEADJR) as the difference between a firm's annual buy-and-hold return and the annual buy-and-hold return for the same 12-month period on the market-capitalization-based portfolio deciles to which the firm belongs.

To estimate nondiscretionary accruals, I extended modified Jones model used by Dechow, Sloan, and Sweeney (1995) by including the change in operating cash flows and beginning-of-year ROA as explanatory variables. Dechow, Sloan, and Sweeney (1995) find that modified Jones model provides the most powerful tests of earnings management among the five models they use in their paper1. Kasznik (1999) includes the change in operating cash flows as an additional explanatory variable in the modified Jones model because Dechow (1994) finds that it is negatively correlated with total accruals. Dechow, Sloan, and Sweeney (1995) also find that if the earnings management partitioning variable is correlated with firm performance, then tests for earnings management are potentially misspecified for all of the models considered. Thus following Kothari, Leone, and Wasley (2004), I add beginning-of-year ROA as another explanatory variable to control for firm performance. I estimate the Jones model in cross-section by industry2 and by year. The predicted value of this Jones model is nondiscretionary accruals (NAC) and the residuals are discretionary accruals (DAC). The extended modified Jones model is expressed in the following equation (firm subscript is omitted for ease of exposition):

$$TACt/TAt\text{-}1=\alpha1[1/TAt\text{-}1]+\alpha2[\Delta REVt/TAt\text{-}1]+\alpha3[PPEt/TAt\text{-}1]+\alpha4[\Delta OCFt/TAt\text{-}1]+\alpha5[ROA\ t\text{-}1]+et \quad (1)$$

where ΔREV is the change in sales revenues (Compustat # 12) adjusted for change in accounts receivable (Compustat # 2) in year t and PPE is the gross property, plant, and equipment in year t (Compustat # 7). ΔOCF is the change in operating cash flow in year t. (Compustat # 308) and ROA is the income before extra items (Compustat # 123) divided by total asset at the beginning of year t.

Panel A of Table 1 provides descriptive statistics for the full sample. Panel B and C provides statistics for firms having high/low institutional ownership and high/low disclosure score respectively. Consistent with Collins, Gong, and Hibra (2003), firms in the HIO subsample are more profitable (5.3% of beginning-of-year assets) and have slightly higher cash flows (12.3% of beginning-of-year assets) than firms in the LIO subsample (1.8% and 11.8%, respectively). The scaled discretionary accruals do not differ significantly across the two subsamples with a mean of 0.7% beginning-of-year assets and a median of 0.3% in the HIO subsample versus a mean of -1.4% and a median of 0.4%. Firms in the LD

[1] The five models include the Healy model, the DeAngelo model, the Jones model, the modified Jones model and the industry model. For detailed discussion, see Dechow, Sloan, and Sweeney (1995).

[2] Industry is classified according to the SIC division structure.

subsample are slightly more profitable than firms in the HD subsample (4% of beginning-of-year assets versus 3.2%). The scaled discretionary accruals also do not differ significantly across HD and LD subsample with a mean of -0.2% beginning-of-year assets and a median of 0.3% in the HIO subsample versus a mean of -0.6% and a median of 0.5%.

Table 1. Descriptive Statistics for selected variables for a sample of 344 firms of year 2001, (a) full sample; (b) firms having high and low institutional ownership; (c) firms having high and low disclosure score.

Panel A: Full Sample					
Variable	Mean	Std.Dev.	Median	Min.	Max.
EARN	0.035	0.126	0.042	-0.900	0.572
CFO	0.120	0.108	0.111	-0.566	0.769
DAC	-0.004	0.083	0.004	-0.738	0.608
NAC	-0.078	0.135	-0.066	-1.390	0.559
SIZEADJR	-0.002	0.259	0.002	-0.676	1.732
IS	71.851	16.914	72.747	0.050	166.815
DISC	3.579	1.319	4.000	0.000	8.000

Full sample consists of 342 firms in year 2001.

Variable definition:

EARN: Income before extraordinary items and discontinued operations (Compustat # 123);

CFO: Net cash flow from continuing operating activities (Compustat # 308- Compustat # 124);

NAC: Non-discretionary accruals=predicted values of the modified Jones Model estimated in cross-section for each two-digit SIC code and year combination;

DAC: Discretionary accruals=residual values of the modified Jones Model estimated in cross-section for each two-digit SIC code and year combination;

SIZEADJR: Size-adjusted abnormal return=the difference between a firm's annual buy-and-hold returns and the buy-and-hold returns for the same 12-month period on the market-capitalization-based portfolio decile to which the firm belongs;

IS: the percent of a company's aggregate number of shares held by institutions to common shares outstanding for the latest available calendar quarter (Compustat Mnemonic IOTSHR0);

DISC: S&P transparency and disclosure score based on annual report alone.

All variables except SIZEADJR, IS and DISC are deflated by beginning-of-year total assets (Compustat #6).

Panel B: HIO(LIO) Subsample										
	Mean		Std. Dev.		Median		Min.		Max.	
Variable	HIO	LIO	HIO	LIO	HIO	LIO	HIO	LIO	HIO	LIO
EARN	0.053	0.018	0.081	0.158	0.042	0.040	-0.139	-0.900	0.572	0.398
CFO	0.123	0.118	0.125	0.087	0.112	0.107	-0.566	-0.211	0.769	0.426
DAC	0.007	-0.014	0.071	0.093	0.003	0.004	-0.278	-0.738	0.608	0.127
NAC	-0.072	-0.085	0.103	0.160	-0.066	-0.064	-0.658	-1.390	0.559	0.343
SIZEADJR	0.008	-0.011	0.275	0.242	0.001	0.006	-0.676	-0.624	1.733	0.477
IS	84.218	59.482	11.736	11.332	81.087	62.235	72.753	-0.050	166.815	72.740
DISC	3.491	3.667	1.134	1.479	4.000	4.000	1.000	0.000	8.000	8.000
Panel C: HD(LD) Subsample										
	Mean		Std. Dev.		Median		Min.		Max.	
Variable	HD	LD	HD	LD	HD	LD	HD	LD	HD	LD
EARN	0.032	0.040	0.122	0.133	0.035	0.050	-0.900	-0.741	0.572	0.398
CFO	0.115	0.127	0.097	0.122	0.101	0.119	-0.350	-0.566	0.769	0.600
DAC	-0.002	-0.006	0.084	0.083	0.003	0.005	-0.645	-0.738	0.608	0.127
NAC	-0.076	-0.081	0.126	0.145	-0.063	-0.067	-1.254	-1.390	0.343	0.559
SIZEADJR	-0.006	0.004	0.230	0.295	0.000	0.006	-0.598	-0.676	0.566	1.733
IS	72.397	71.097	16.187	17.896	72.288	72.827	16.992	-0.050	166.815	136.733
DISC	4.480	2.340	0.911	0.581	4.000	2.000	4.000	0.000	8.000	3.000

All firms are ranked based on IS, HIO (high institutional ownership) subsample includes 171 firms. LIO (low institutional ownership) subsample includes 171 firms in Panel B.

All firms are ranked based on DISC, HD(high disclosure level) subsample includes 144firms. LD (low disclosure level) subsample includes 198 firms in Panel C.

Table 2 reports Pearson and Spearman correlation coefficients for variables used in our analysis. Consistent with Collins, Gong, and Hibra (2003), there is no significant association between institutional ownership (IS) and scaled discretionary accruals (total accruals in their paper), which reduces the concern that any differences between the HIO and LIO subsamples is simply capturing differences in the magnitude of discretionary accruals in the two subsamples. This is also so for the association between the disclosure score (DISC) and scaled discretionary accruals, therefore the difference between the HD and LD subsamples is not simple due to the difference in the magnitude of discretionary accruals.

Table 2. Pearson (upper diagonal) and Spearman (lower diagonal) correlation coefficients for selected variable for a sample of 342 firms in 2001.

Variable	EARN	CFO	DAC	NAC	SIZEADJR	IS	DISC
EARN		0.302	0.260	0.477	0.345	0.099	0.008
		(<0.001)	(<0.001)	(<0.001)	(<0.001)	(0.066)	(0.889)
CFO	0.539		−0.462	0.188	0.114	−0.010	−0.054
	(<0.001)		(<0.001)	(<0.001)	(0.035)	(0.848)	(0.317)
DAC	0.221	−0.664		−0.226	0.071	0.084	0.093
	(<0.001)	(<0.001)		(<0.001)	(0.192)	(0.120)	(0.086)
NAC	0.523	0.385	−0.344		0.210	0.112	0.033
	(<0.001)	(<0.001)	(<0.001)		(<0.001)	(0.038)	(0.545)
SIZEADJR	0.427	0.194	−0.063	0.271		−0.040	−0.003
	(<0.001)	(<0.001)	(0.244)	(<0.001)		(0.464)	(0.951)
IS	0.020	−0.002	0.027	0.030	−0.036		0.011
	(0.716)	(0.970)	(0.623)	(0.579)	(0.510)		(0.841)
DISC	−0.103	−0.070	0.051	−0.057	−0.006	0.015	
	(0.057)	(0.195)	(0.339)	(0.290)	(0.919)	(0.781)	

p-values are given in parentheses.

The variables are previously defined in Table 1.

IV. Test Design and Results

Mishkin Test

To test Hypothesis 1a, I use the framework which is developed by Mishkin (1983) to test the rational expectations hypothesis in macroeconomics (the Mishkin test hereafter). The Mishkin test is widely used to test market pricing of earnings components (Sloan (1996), Xie (2001), and Collins, Gong, and Hibra (2003)). I estimate the following regression system:

$$EARN_t=\gamma_0+\gamma_1 CFO_t+\gamma_2 D1\times CFO_t+\gamma_3 D2\times CFO_t+\gamma_4 D3\times CFO_t+\gamma_5 NAC_t+\gamma_6 D1\times NAC_t+\gamma_7 D2\times NAC_t+\gamma_8 D3\times NAC_t+\gamma_9 DAC_t+\gamma_{10} D1\times DAC_t+\gamma_{11} D2\times DAC_t+\gamma_{12} D3\times DAC_t+v_{t+1} \quad (2)$$

$$SIZEADJR_{t+1}=\delta_0+\delta_1[EARN_t-\gamma_0-\gamma_1^{*}CFO_t-\gamma_2^{*}D1\times CFO_t-\gamma_3^{*}D2\times CFO_t-\gamma_4^{*}D3\times CFO_t-\gamma_5^{*}NAC_t-\gamma_6^{*}D1\times NAC_t-\gamma_7^{*}D2\times NAC_t-\gamma_8^{*}D3\times NAC_t-\gamma_9^{*}DAC_t-\gamma_{10}^{*}D1\times DAC_t-\gamma_{11}^{*}D2\times DAC_t-\gamma_{12}^{*}D3\times DAC_t]+\omega_{t+1} \quad (3)$$

where all variables are defined as before. I partition the full sample into four subsamples: (1) LIO and LD; (2) LIO and HD; (3) HIO and LD; and (4) HIO and HD. D1 is a dummy variable that equals one for firms in the LIO and HD subsample and zero otherwise. D2 is another dummy variable that equals one for firm in the HIO and LD subsample and zero otherwise. D3 is the last dummy variable that equals one for firms in HIO and HD subsamples and zero otherwise. HIO, LIO, HD, and LD subsamples are as defined in Table 1.

Equation (2) is a forecasting equation that estimates the forecasting coefficients (γs) of discretionary accruals and other earnings components for predicting one-year-ahead earnings. γ 9 capture the persistence of discretionary accruals for predicting one-year-ahead earnings for firms with low institutional ownership and low disclosure level; γ 10 capture the incremental persistence in the LIO and HD subsample; γ 11 capture the incremental persistence in the HIO and LD subsample; and γ 12 capture the incremental persistence in the HIO and HD subsample. Equation (3) is a valuation equation that estimates the valuation coefficients (γ*s) that the market assigns to discretionary accruals and other earning components. As in Mishkin (1983), I estimate equations (2) and (3) jointly using an iterative generalized nonlinear least squares estimation procedure, proceeding in two stages. H1a predicts that the ratio ofγ 9 toγ 9* is significantly less than the ratio of (γ 9+γ 10) to (γ 9*+γ 10*); and there is no significant difference between the ratio of (γ 9+γ 11) to (γ 9*+γ 11*) and the ratio of (γ 9 + γ 12) to (γ 9*+γ 12*).

Table 3 presents the results from jointly estimating equation (1) and (2). The ratio ofγ 9 andγ 9* (=0.368) is significantly less than one (p-value <0.01), which indicates that the market overestimates the persistence of accruals in the LIO and LD subsample. However the ratio of (γ 9+γ 10) to (γ 9*+γ 10*), (γ 9+γ 11) to (γ 9*+γ 11*), and (γ 9+γ 12) and (γ 9*+γ 12*) are all not significantly different from zero (p-value at 0.95, 0.82 and 0.16 respectively), indicating that there is no statistically significant mispricing in the LIO and HD, HIO and LD, and HIO and HD subsample. Moreover, the ratio ofγ 9 andγ 9* is significantly (at 95% level) different from the ratio of (γ9+ γ10) to (γ9*+ γ10*), indicating that for low institutional ownership subsample, there are significant differences in the efficient pricing of discretionary accruals between high disclosure level and low disclosure level firms. This is consistent with H1a. The ratio ofγ 9 andγ 9* is also marginally significantly different (at 90% level) from the ratio of (γ 9+γ 11) to (γ 9*+γ 11*), indicating that when firms' disclosure levels are low, institutional investors have marginally higher ability to see through accrual figures and price them more accurately or they have other information sources which is consistent with the findings of Collins, Gong, and Hibra (2003). However there are no significant difference between the ratio of (γ 9+γ 12) to (γ 9*+γ 12*) and the ratio of (γ 9+γ 10) to (γ 9*+γ 10*), indicating when the disclosure level in annual report is high, non-institutional investors' estimation accuracy of the persistence of discretionary accruals does not differ significantly from institutional investors. There are also no significant difference between the ratio of (γ 9+γ 12) to (γ 9*+γ 12*) and the ratio of (γ 9+γ 11) to (γ 9*+γ 11*), indicating that for institutional investors, the increase in disclosure level in annual reports do not significantly increase their accuracy of assessment of the persistence of discretionary accruals, which is also consistent with H1a.

The results in Table 3 are consistent with Collins, Gong, and Hibra (2003) that institutional investors better understand the persistence of accruals no matter the disclosure level in the public document. The results also reveal that the increase in disclosure level in public documents will increase non-institutional investors' accuracy of estimation of persistence of discretionary accruals.

Table 3. Ratios of market perceptions of persistence parameters to forecasting parameters and p-values from Mishkin tests of equality of perceived and forecasting parameters.

$$EARN_t=\gamma_0+\gamma_1 CFO_t+\gamma_2 D1\times CFO_t+\gamma_3 D2\times CFO_t+\gamma_4 D3\times CFO_t+\gamma_5 NAC_t+\gamma_6 D1\times NAC_t+\gamma_7 D2\times NAC_t+\gamma_8 D3\times NAC_t+\gamma_9 DAC_t+\gamma_{10} D1\times DAC_t+\gamma_{11} D2\times DAC_t+\gamma_{12} D3\times DAC_t+v_{t+1}$$

$$SIZEADJR_{t+1}=\delta_0+\delta_1[EARN_t-\gamma_0-\gamma_1 *CFO_t-\gamma_2 *D1\times CFO_t-\gamma_3 *D2\times CFO_t-\gamma_4 *D3\times CFO_t-\gamma_5 *NAC_t-\gamma_6 *D1\times NAC_t-\gamma_7 *D2\times NAC_t-\gamma_8 *D3\times NAC_t-\gamma_9 *DAC_t-\gamma_{10} *D1\times DAC_t-\gamma_{11} *D2\times DAC_t-\gamma_{12} *D3\times DAC_t]+\omega_{t+1}$$

	Coeff. Est.	t-stat
γ9	0.290	2.790
γ10	0.138	0.993
γ11	0.390	1.625
γ12	0.175	0.750
γ9*	0.789	2.126
γ10*	-0.344	-0.707
γ11*	-0.481	-0.572
γ12*	-1.308	-1.533
γ9/γ9*	0.368	
γ9+γ10/γ9*+γ10*	0.962	
γ9+γ11/γ9*+γ11*	2.208	
γ9+γ12/γ9*+γ12*	-0.896	

Market efficiency tests

Equality of discretionary accruals parameters across equations for LIO and LD

(i.e., 0.368 different from 1?)

Reject γ9=γ9* p<0.01

Equality of accruals parameters across equations for LIO and HD

(i.e., 0.962 different from 1?)

Cannot reject (γ9+γ10)= (γ9*+γ10*) p=0.95

Equality of accruals parameters across equations for HIO and LD

(i.e., 2.208 different from 1?)

Cannot reject (γ9+γ11)= (γ9*+γ11*) p=0.82

Equality of accruals parameters across equations for HIO and HD

(i.e., -0.896 different from 1?)

Cannot reject (γ9 +γ12)= (γ9*+γ12*) p=0.16

Difference in market efficiency ratios LD and LIO vs. HDand LIO

Reject γ9/γ9* =(γ9+γ10)/(γ9*+γ10*) p=0.05

Difference in market efficiency ratios LD and LIO vs. LD and HIO

Reject γ9/γ9* =(γ9+γ11)/(γ9*+γ11*) p=0.10

Difference in market efficiency ratios HD and HIO vs. HD and LIO

Cannot reject (γ9+γ12)/(γ9*+γ12*)=(γ9+γ10)/(γ9*+γ10*) p=0.23

Difference in market efficiency ratios HD and HIO vs. LD and HIO

Cannot reject (γ9+γ12)/(γ9*+γ12*)=(γ9+γ11)/(γ9*+γ11*) p=0.57

D1 is a dummy variable that equals one for firms in the LIO and HD subsample and zero otherwise. D2 is another dummy variable that equals one for firm in the HIO and LD subsample and zero otherwise. D3 is the last dummy variable that equals one for firms in HIO and HD subsamples and zero otherwise. HIO, LIO, HD, and LD subsamples are as defined in Table 1.

Discretionary-accrual-based Hedge Portfolio Abnormal Returns

This paper uses a hedge portfolio test to address hypothesis H1b. In a discretionary-accrual-based trading strategy, investors long in firms in the lowest discretionary accruals portfolio and short in firms in the highest accrual portfolio. Future returns (R) are annual buy-and-hold returns for the 12-month period ending three months after the firm's fiscal year end, which is measured as the difference between a firm's annual buy-and-hold return and the annual buy-and-hold return for the same 12-month period on the market-capitalization-based portfolio deciles to which the firm belongs.

Following Collins, Gong, and Hibra (2003), I sort firms into deciles based on their discretionary accruals for that year and conduct cross-sectional regressions including industry dummy. Industry dummy is included because the disclosure requirement may be different across industries. I estimate and report the following relation between future abnormal returns and the scaled portfolio rank of discretionary accruals for LIO subsample only, because according to the previous results, the disclosure level will only affect non-institutional investors' estimation accuracy of the persistence of discretionary accruals.

$$R_{t+1}=\sigma_0 + \sigma_1 D1_t + \sigma_2 RACC_t + \sigma_3 D1*RACC_t + \sigma_4 INDUSTRYDUMMY_t + \xi_{t+1} \quad (4)$$

Where RACC equals the portfolio decile rank of discretionary accruals, scaled to range between zero and one. Industry is classified the same as that in the Jones model in Section III. This scaling facilitates our interpretation of the coefficient of RACC as the hedge return to a zero investment strategy with a long position in the highest accruals portfolio and a short position in the lowest accruals portfolio (Collins, Gong, and Hibra, 2003). D1 is a dummy variable that equals one for firms in the LIO and HD subsample and zero otherwise. D1*RACC is an interaction term between disclosure level and the scaled portfolio decile rank of discretionary accruals. $|\sigma_2|$ and $|\sigma_2+\sigma_3|$ can be interpreted as the hedge return from the zero investment strategy for the LD and HD subsample respectively. I expect σ2 to be negative since the LD subsample likely experiences overpricing of discretionary accruals. According to the primary results in the previous section, I predict the hedge return for the HD subsample would be smaller relative to that for LD subsample. Therefore, we expect $|\sigma_2+\sigma_3|$ is less than $|\sigma_2|$. Due to data limitation, I can not calculate t-statistics based on the time-series average and standard deviation of the annual coefficients (Fama and MacBeth, 1973) as Collins, Gong, and Hibra (2003) did. My t-statistics is calculated as the coefficient estimates divided by the standard error of the estimates. Such limitation may make my results incomparable to the literature to some extent especially in terms of the t-statistics.

Table 4 presents the results of estimating equation (4) for the LIO subsample, industry dummy is included but not reported. σ2 (=-0.145) is significantly negative (at 5%), while $|\sigma_2+\sigma_3|$ (=|-0.145+0.110|=0.035) is not significantly different from zero (p=0.636). The results indicate that there are significant arbitrage profits from a discretionary-accrual-based trading strategy for the LD subsample, however there is no abnormal return for the HD subsample, which is consistent with H1b.

Table 4. Coefficient estimates and t-statistics from cross-section regression of one-year-ahead size-adjusted buy-and-hold returns on the portfolio ranks of accruals and industry dummy for LIO subsample.

$$R_{t+1}=\sigma_0 + \sigma_1 HD_t + \sigma_2 RACC_t + \sigma_3 D1*RACC_t + \sigma_4 INDUSTRYDUMMY_t + \xi_{t+1}$$

	Coefficient	t-statistics
σ_1	0.021	0.376
σ_2	-0.145	-2.045
σ_3	0.110	1.690
Industry Dummy Included		
Cannot reject $\sigma 2+\sigma 3=0$ p=0.636		

LIO consists of 171 firms.

Variable definition:

Rt+1: Size-adjusted abnormal return=the difference between a firm's annual buy-and-hold returns and the buy-and-hold returns for the same 12-month period on the market-capitalization-based portfolio decile to which the firm belongs;

RACC: the portfolio decile rank of discretionary accruals, scaled to range between zero and one;

D1 is a dummy variable that equals one for firms in the LIO and HD subsample and zero otherwise. HD and LD is defined in Table 1;

Industry dummy is classified the same as that in the Jones model specified in Section III.

The unreported results of equation (4) for HIO subsample reveal that there is no significant abnormal return irrespective of the disclosure level, which is consistent with the results of the Mishkin test in the previous section.

V. Sensitivity Analysis

The results reported in this paper are based on the accruals calculated under Hibra and Collins' (2002) cash flow approach. I examine the results' robustness to the alternative indirect balance sheet approach. Total accrual under indirect balance sheet approach is calculated as follows:

TAC=ΔCA-ΔCL-ΔCASH+ΔSTDEBT-DEP

Where ΔCA is change in current asset, ΔCL is change in current liability, ΔCASH is change in cash and cash equivalents, ΔSTDEBT is the current maturities of long-term debt and other short-term debt included in the current liabilities, and DEP is the depreciation and amortization expense. The unreported results are not qualitatively different from the results in the previous section.

I also use the alternative disclosure score on a composite basis as the disclosure measure, which include, in addition to the annual reports, the regulatory-driven 10-K and proxy statements. The two disclosure measures are highly correlated with each other. One explanation is that my sample contains only firms from S&P 500, and large corporations may provide more robust disclosure in their annual reports as a best practice, not because it is required by regulation (Standard and Poor, 2002). In other words, large corporations use annual reports as their main disclosure channel, so the disclosure score on a composite basis does not differ significantly from the disclosure score on annual reports only. As expected the unreported results are not qualitatively different from the reported one.

VI. Conclusion

This paper examines whether disclosure will help market more correctly price the discretionary accruals. Both the Mishkin test and the hedge portfolio test results suggest that public disclosure will help non-institutional investors more correctly assess the persistence of discretionary accruals and thus price them more correctly. In addition, institutional investors have information advantage, such as great access to management, and superior analysis ability, so they better understand the valuation implication in discretionary accruals irrespective of the disclosure level in public documents.

The study raises additional issues for future research. Of particular interest is the question whether the content of information matters. This paper uses the total disclosure in annual reports as a measure of the firm's disclosure level. However, there are various information contained the public documents; some of them may be more relevant to investors to understand the value implication of earning components, while others are not so important. The S&P transparency and disclosure study provides three sub-scores: (1) ownership structure and investor rights; (2) financial transparency and information disclosure; and (3) board and management structure and process, which can be utilized to address this question.

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