Predicting Stock Market Returns with Aggregate Discretionary Accruals[*]

Qiang Kang [†]
University of Miami

Qiao Liu [‡]
University of Hong Kong

Rong Qi [§]
St. John's University

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[†]Finance Department, University of Miami, P.O. Box 248094, Coral Gables, FL 33124-6552. Phone: (305)284-8286. Fax: (305)284-4800. E-mail: q.kang@miami.edu.

[‡]School of Economics and Finance, University of Hong Kong, Pokfulam, Hong Kong. Phone: (852)2859-1059. Fax: (852)2548-1152. E-mail: qliu@hku.hk.

[§]Peter J. Tobin College of Business, St. John's University, Jamaica, NY 11439. Phone: (718) 990-7320. E-mail: qir@stjohns.edu.

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Abstract

We document that the value-weighted aggregate discretionary accruals have significant power in predicting the one-year-ahead stock market returns between 1965 and 2004. The predictive relation is stable and robust to different ways to measure market returns and discretionary accruals as well as to the inclusion of other known return predictors. The value-weighted aggregate discretionary accruals are positively related to future stock market returns and negatively correlated with contemporaneous market returns. Our extensive analysis favors the managerial equity market timing story. We also report evidence to reconcile the two qualitatively different accrual-return relations between the firm level and the aggregate level, lending support to Samuelson's (1998) conjecture that modern markets demonstrate considerable *macro* inefficiency.

JEL Classification: G1, M4

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1 Introduction

The empirical asset pricing literature over the last two decades has documented strong evidence that aggregate market returns are time-varying and predictable with various variables.[1] Against the backdrop of a time-varying equity risk premium, we empirically examine in this paper the power of aggregate accruals and particularly, aggregate discretionary accruals in predicting one-year-ahead aggregate stock market returns in excess of risk-free returns, the equity market risk premium, and explore various possible explanations for such predictive relations. Our analysis demonstrates that value-weighted aggregate accruals and discretionary accruals positively predict one-year-ahead stock market returns between 1965 and 2004. Our further and extensive analysis favors a behavioral explanation for the predictive relation, that is, firm managers time equity markets to manage earnings. Our evidence also indicates that managers of large firms have stronger ability in timing equity markets than managers of small firms do. We also provide evidence that the qualitatively different (discretionary) accrual-return relations at the firm- or portfolio- level and at the aggregate level can coexist. We further show that this accrual-return relation at the aggregate level is much stronger than the relation at the disaggregate level, lending support to Samuelson's (1998) conjecture that modern markets demonstrate considerable *macro* inefficiency.

Our motivation is quite straightforward. A growing literature investigates managerial equity market timing ability and finds that managerial decision variables such as insider trading, equity shares in new issues, and investment plans are able to predict aggregate stock market returns (see, e.g., Seyhun, 1992; Baker and Wurgler, 2000; Lamont, 2000; and Lakonishok and Lee, 2001). Because earnings management is a routine managerial decision subject to a great deal of discretion, we conjecture that if managers indeed have the ability to time the equity market to make decisions, such managerial behavior will be reflected in the relation between market returns and market-wide earnings management measures. As a result, proxies for market-wide earnings management, aggregate accruals and their discretionary component, are able to forecast the stock return at the

[1] A short list of such variables include dividend yield (Campbell and Shiller, 1988; and Fama and French, 1988), term spread (Keim and Stambaugh, 1986; and Fama and French, 1989), book-to-market ratio (Kothari and Shanken, 1997; and Pontiff and Schall, 1998), default premium (Keim and Stambaugh 1986; and Fama and French, 1989), short-term interest rate (Fama and Schwert, 1977; Campbell, 1987; and Ang and Bekaert, 2005), and consumption-wealth ratio (Lettau and Ludvigson, 2001). Although some recent studies question the statistical significance and out-of-sample power of return predictability (e.g., Goyal and Welch, 2005), Cochrane (2006) forcibly argues that the absence of dividend growth forecastability provides much stronger evidence for return predictability than does the return forecast alone.

aggregate level.

Our paper makes two potential incremental contributions. One is that we decompose aggregate accruals into normal and discretionary components and show that the predictive power is concentrated in the discretionary component of large firms. We document robust evidence that, in addition to various variables characterizing business-cycle conditions and marketing-timing behavior, aggregate discretionary accruals of large firms, constructed in different approaches, strongly and positively predict future market returns. After an extensive analysis we conclude that our evidence favors the managerial equity market timing story. Another contribution is that not only do we document a strongly positive (discretionary) accrual-return relation at the aggregate level, which is *qualitatively* different from this relation at the disaggregate level, but we also show evidence that the two qualitatively different relations can coexist in a unified empirical framework, paving the way toward fully reconciling the qualitative difference in theory. We further demonstrate that this (discretionary) accrual-return relation at the aggregate level is stronger in a magnitude of several orders than the relation at the disaggregate level, suggesting that firms (or investors) respond asymmetrically to market-wide shocks and non-market-wide shocks. Our study thus offers support to Samuelson's (1998) conjecture that aggregate stock market behavior could differ from individual stock price behavior and that modern markets demonstrate considerable *macro* inefficiency.

We carry out our empirical analysis in multiple steps. Because empirical studies on return predictability typically suffer from a bias in the predictive coefficient estimate and the bias is severe in a small sample (Stambaugh, 1986, 1999; Nelson and Kim, 1993), we first use the Baker, Taliaferro and Wurgler's (2005) framework to carry out a monte-carlo analysis of the impact of the small-sample bias. Our simulation analysis shows that the bias only accounts for a tiny proportion of the actual coefficient estimate and that the actual coefficient estimate falls in the far right tail of the histogram of the simulated estimates. Thus, we reject the notion that the bias severely affects our empirical results.

We start with examining the power of the aggregate accruals in forecasting one-year-ahead excess stock market returns (NYSE/AMEX index returns minus one-month T-Bill rates). Both the univariate analysis and the multivariate analysis show that the value-weighted aggregate accruals positively and significantly predict the aggregate stock market returns, but the equal-weighted aggregate accruals do not have any forecasting power.[2] We then use the modified Jones' (1991) model to decompose firm-level accruals into normal accruals and discretionary accruals. We calculate aggregate normal accruals and aggregate discretionary accruals and separately investigate the power of the two aggregate accruals in forecasting the one-year-ahead aggregate market returns.[3] Neither the aggregate normal accruals (value-weighted or equal-weighted) nor the equal-weighted aggregate discretionary accruals demonstrate any forecasting power. In contrast, the value-weighted aggregate discretionary accruals have strong forecasting power. In a univariate analysis, the value-weighted aggregate discretionary accruals alone explain 17.9% of variations in the one-year-ahead value-weighted or equal-weighted stock returns. Moreover, the forecasting power of the value-weighted aggregate discretionary accruals is robust to outliers, sample periods, measures of market returns and discretionary accruals, and the inclusion of well-known market return predictors such as aggregate dividend yield, term premium, default premium, short rate, aggregate book-to-market ratio, and consumption-wealth ratio.

Given the empirical results, we explore various explanations that can potentially account for the power of the value-weighted aggregate (discretionary) accruals in forecasting the equity market risk premium. After ruling out statistical arguments like the small-sample bias and measurement errors, we concentrate on two competing economic stories.

The market-efficiency story suggests that either some unobserved underlying economic force drives the predictive relation between the aggregate discretionary accruals and aggregate stock market returns (the omitted-factor hypothesis) or the aggregate discretionary accruals serve as a proxy for the overall business conditions and contains information about economic activities (the business-condition-proxy hypothesis). If the former, we expect a statistical *bi-directional* predictive relation between the two. We apply the Granger causality test to the omitted-factor hypothesis. We find robust evidence that there is only one-directional predictive relation from the value-weighted

[2] Hirshleifer, Hou, and Teoh (2005) report similar evidence with value-weighted aggregate accruals. We are grateful to one of the authors for bringing their paper to our attention when we were polishing our paper. They report equal-weighted aggregate accruals to have significant return forecasting power as well, but we do not. We find that the difference between their and our results on equal-weighted aggregate accruals is likely due to the differences in sample constructions. When we include firms with extreme values of accruals into our sample, the equal-weighted aggregate accruals obtains some predictive power. See Section 2.1 for details of our sample construction.

[3] In un-reported analysis, we also use the definition of accruals to examine the return forecasting power of each balance-sheet-item component of accruals at the aggregate level. Thomas and Zhang (2002) report that the cross-sectional accrual anomaly is largely related to inventory. We do not find evidence that aggregate inventory or other aggregate measures of balance-sheet-item accruals components have power in forecasting future market returns, though.

aggregate discretionary accruals to the aggregate market returns, but not the other way around, refuting the omitted-factor hypothesis. If the latter, we expect the aggregate normal accruals to outperform the aggregate discretionary accruals in forecasting the time-varying risk premium because the normal accruals reflect business conditions while the discretionary accruals mainly reflect managerial discretion in reporting earnings at the firm-level.[4] We find that neither the value-weighted nor the equal-weighted aggregate normal accruals predict next-year stock market returns and that the value-weighted aggregate accruals derive their return forecasting power solely from its discretionary component, contradicting this business-condition-proxy hypothesis.

We then zero in on the market-inefficiency story. In a simple predictive regression using the value-weighted aggregate discretionary accruals as the sole predictor of one-year-ahead excess stock market returns, we obtain five *negative* forecasts of the equity market risk premium, accounting for 12.82% of the aggregate return forecasts for the period from 1965 to 2004. In the five years, 1966, 1968, 1969, 1970, and 2002, the actual excess market returns were all negative except in 1968.[5] The evidence that the value-weighted aggregate discretionary accruals sometimes predict *negative* market risk premiums casts a doubt on market efficiency and favors market inefficiency. The managerial equity market timing story is likely to explain the forecasting power of the aggregate accrual measures. That is, sensing an increase in the next-period's market risk premium, firm mangers increase the levels of (discretionary) accruals today. Everything else equal, an expected increase in the future risk premium (hence the discount rate) lowers today's market valuation. If firm managers manage earnings in response to shifts in aggregate market valuations, then managers adjust up the accruals to inflate the concurrent earnings when the current market valuation drops.

The managerial market timing story implies that if managers' behaviors are somewhat correlated, we then expect a negative relation between aggregate (discretionary) accruals and contemporaneous aggregate market returns. To test this implication, we examine the contemporaneous relations between innovations in the aggregate accrual measures and the aggregate market returns. We specify a system of equations to characterize the contemporaneous relation

[4]In the paper we examine the respective powers of the normal and discretionary components of the aggregate accruals in predicting one-year-ahead GDP growth rates. The value-weighted aggregate normal accruals predict the one-year-ahead GDP growth rate but the value-weighted aggregate discretionary accruals do not.

[5]Because the stock market must be a hedge against aggregate consumption for a rational asset pricing model to predict negative market risk premiums, researchers have used this return forecasting approach to test market efficiency (Fama and Schwert, 1977; Fama and French, 1988; Kothari and Shanken, 1997; Baker and Wurgler, 2000).

and the dynamics of each independent variable, and we apply the Generalized Method of Moments (GMM) estimation to the system. Both the innovations in the aggregate accruals and the innovations in aggregate discretionary accruals are negatively and significantly related to contemporaneous market returns, and the respective adjusted R^2's are 0.237 and 0.311 for value-weighted market returns and are 0.461 and 0.494 for equal-weighted market returns. In contrast, the innovations in the aggregate normal accruals are unrelated to contemporaneous marker returns at all. The results are robust to including into the system innovations in business-condition variables known to relate with aggregate market returns.

The managerial equity market timing story receives a further boost from the study of the relations between aggregate accrual measures and contemporaneous GDP growth rates. The innovations in the aggregate normal accruals are positively and significantly correlated with the current GDP growth rate, regardless of whether or not we control for the impact of the innovations in other business-condition variables. The innovations in the aggregate discretionary accruals are slightly significantly correlated with the current GDP growth rate only through their correlations with the innovations in other business-condition variables. As a result, the aggregate accruals appear to derive their correlations with the current GDP growth rates through their normal component. The finding indicates that managers time the aggregate equity market but not the macroeconomic condition to manage earnings.

Given the managerial equity market timing story, we proceed to analyze whether the value-weighted aggregate discretionary accruals contain incremental return forecasting power relative to other market-timing variables known to forecast market returns. Unlike such managerial decisions as equity issues or corporate investments which typically bear high implementation costs, earnings reporting and management is a routine business (on a quarterly or annual basis) subject to a great deal of managerial discretion and manipulation. As a proxy for managerial equity market timing, the aggregate discretionary accruals are expected to exhibit significant, if not stronger, power in forecasting aggregate market returns than other market-timing variables. After controlling for variables like equity shares in new issues (Baker and Wurgler, 2000), planned investment (Lamont, 2000), and investment sentiment measure (Baker and Wurgler, 2005), the value-weighted aggregate discretionary accruals retain significant incremental return forecasting power. Furthermore, we investigate the return predicting power of aggregate discretionary accruals for small, medium, and large firms, respectively, and we find that the predictive relation is concentrated in large firms, suggesting that mangers of large firms have stronger ability than managers of small firms in timing equity markets to manage earnings.[6]

Because the accruals literature documents prevalent evidence that accruals/discretionary accruals negatively predict stock returns at the firm- and portfolio- level (see, e.g., Sloan, 1996; Collins and Hribar, 2000; and Xie, 2001) and we report strong evidence that accruals/discretionary accruals positively predict stock returns at the aggregate level, the seemly opposite results make readers wonder whether the two results are contradictory to each other. We thus offer some evidence that the two qualitatively different accrual-return relations can coexist in a unified empirical framework. Specifically, we run a predictive regression, for each firm, of the firm's stock returns against its one-year-lagged discretionary accruals and/or one-year-lagged value-weighted aggregate discretionary accruals. We then summarize the cross-sectional statistics of the estimates. We find that the predictive coefficient estimates on the firm-level discretionary accruals and the aggregate discretionary accruals are significantly negative and significantly positive, respectively. Moreover, the coefficient on the aggregate discretionary accruals is about 35 to 40 times larger in magnitude than the coefficient on the firm-level discretionary accruals, and the aggregate discretionary accruals outweigh the firm-level discretionary accruals in forecasting firm-level returns. This finding showcases the cohabitation of the two qualitatively different accrual-return relations and the relative importance of the aggregate-level relation over the firm-level relation. Our results also lend support to Samuelson's (1998) conjecture that aggregate stock market behavior could differ from individual stock price behavior and that modern financial markets shows considerable macro inefficiency. Although we are not able to offer one story that can fully reconcile the two qualitatively different relations, our study moves one step further toward that direction.

Our study is related to three research fields. Applying a log-linear approximation to the discounted-cash-flow model, Campbell and Shiller (1988) and Campbell (1991) derive that a

[6]The conventional wisdom appears to suggest, at the firm level, earnings management occurs more oftentimes in small firms than in large firms. Taking it at the face value, the observation does not necessarily mean that managers of small firms, although they may have more incentives to manage earnings, have better skills in timing aggregate markets than managers of large firms. Also, it might be the case that managers of large firms are more likely and capable of responding to market-wide shocks than managers of small firms because such systematic shocks are difficult to arbitrage away, and that managers of small firms are relatively more likely to and comfortable in responding to non-market-wide shocks. See Section 7 for more discussions on the seemingly different behaviors at the aggregate level versus at the disaggregate level.

return surprise is associated with either cash flow news or discount rate news. Earnings, one important source of cash flows, thus are expected to relate to stock returns. Despite ample evidence showing such a linkage at firm– or portfolio–level, Kothari, Lewellen and Warner (2005) find little evidence that aggregate earnings surprises forecast aggregate market returns. They provide evidence suggesting a positive co-movement of aggregate earnings with changes in discount rates. It is natural to examine whether components of earnings exhibit similar behavior, what are the relative importance of earnings components to the aggregate earnings behavior, and whether the co-movement with discount rates is consistent with a market-efficiency argument or a behavioral argument. Our study helps further our understanding of the connections among cash flows, earnings, accruals, discount rates, and stock returns.

There exist two different schools of interpretations on the accrual anomaly. One typical behavioral argument states that investors fail to recognize the low persistence of accruals/discretionary accruals and consequently over-price (discretionary) accruals (e.g., Sloan, 1996; and Xie, 2001). In contrast, some recent studies argue that the firm-level accrual-return relation is a manifestation of either the growth/value anomaly or the fundamental investment information contained in accruals (e.g., Fairfield, Whisenant, and Yohn, 2003; Desai, Rajgopal, and Venkatachalam, 2004; and Zhang, 2006), suggesting that the accrual anomaly is potentially consistent with a risk-based argument. Building on Samuelson's (1998) conjecture that modern markets show considerable macro inefficiency, if the accruals anomaly is mainly due to a behavioral argument, we expect market inefficiency to be more pronounced at the aggregate level. Thus, our study of the relation at the aggregate level helps shed light on the accrual anomaly.

A stream of research emerges to explore the differences of stock price behaviors at the firm level versus the aggregate level (Samuelson, 1998; Shiller, 2001; Yan, 2004; and Lamont and Stein, 2006). Yan (2004) builds a general equilibrium asset pricing model with incomplete information to explain such a disparity. Samuelson (1998), however, conjectures that the aggregate market behavior could differ from the individual stock's price behavior simply because modern markets show *micro* efficiency but considerable *macro* inefficiency in the sense that mis-pricing at the individual level can be quickly arbitraged away while mis-pricing at the aggregate market level tends to sustain. Lamont and Stein (2006) further develop Samuelson's (1998) idea to design a macro-versus-micro approach and show that corporate equity issuance and merger activity tends to reflect managerial market timing. Our study offers evidence in supportive of Samuelson's (1998) conjecture, and the finding of the cohabitation of the qualitatively different accrual-return relations at the aggregate and disaggregate levels in a unified empirical framework helps incite researchers' interests to reconcile the difference in theory.

The remainder of the paper is structured as follows. Section 2 summarizes data. Section 3 discusses the empirical method and conducts a monte-carlo analysis. Section 4 examines the power of the aggregate accruals and their normal and discretionary components in forecasting one-year-ahead aggregate market returns. Section 5 explores both market-efficiency arguments and market-inefficiency arguments. Section 6 discusses further about the managerial market timing story. Section 7 offers evidence toward reconciling the qualitatively different accrual-return relations at the aggregate level and the firm level in a unified empirical framework. Section 8 concludes.

2 Data

2.1 Aggregate Accrual Measures

We obtain accounting data and return data from Standard & Poor's Compustat database and Center for Research in Security Prices (CRSP) database, respectively, and use the Compustat information to calculate firm-level accruals. We choose NYSE/AMEX firms with December fiscal year ends. Following the literature, we apply the balance sheet method (Sloan, 1996) to calculate (total) accruals as follows:[7]

$$Accruals = (\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD - \Delta TP) - Dep, \qquad (1)$$

where ΔCA = change in current assets (Compustat item 4), $\Delta Cash$ = change in cash/cash equivalents (Compustat item 1), ΔCL = change in current liabilities (Compustat item 5), ΔSTD = change in debt included in current liabilities (Compustat item 34), ΔTP = change in income taxes payable (Compustat item 71), and Dep = depreciation and amortization expense (Compustat item 14). Following Sloan (1996), we scale a firm's accrual by the firm's average total assets (TA, Compustat item 6) from the beginning to the end of a fiscal year. We then calculate both

[7]For robustness check, we also use other methods to calculate accruals. Results are similar. See Section 4.3 for details.

equal-weighted aggregate accruals (AC_EW) and value-weighted aggregate accruals (AC_VW). To reduce the impact of outliers, we delete from the sample firms whose accruals are ranked at the top and bottom 0.5%. (Our main results remain quantitatively similar if we retain those observations or if we truncate the sample at other percentiles.) For value-weighted aggregate accruals, we weight each firm's accruals by the firm's market capitalizations at the beginning of the fiscal year and average them across all NYSE/AMEX firms. Similarly, we compute the equal-weighted aggregate accruals.

We use the modified Jones' (1991) model to decompose firm-level (total) accruals into normal accruals and discretionary accruals in cross-section (firm subscript omitted for ease of exposition):[8]

$$Accruals_t/\overline{TA_t} = a_1/\overline{TA_t} + a_2\Delta Rev_t/\overline{TA_t} + a_3 PPE_t/\overline{TA_t} + e_t, \quad (2)$$

where ΔRev_t is the change in sales revenues in year t (Compustat item 12) and PPE_t is gross property, plant, and equipment in year t (Compustat item 7). We use the ordinary least-square method (OLS) to estimate equation (2) for each two-digit SIC code and year combination, and we delete firm-year observations if the two-digit sector where the firms belong to contains less than ten observations. We denote the predicted values of the Jones model as normal accruals and the residuals as discretionary accruals.[9] Like aggregate accruals, we compute value-weighted and equal-weighted aggregate normal accrual measures (NAC_VW and NAC_EW) and aggregate discretionary accrual measures (DAC_VW and DAC_EW) correspondingly.

Because sufficient accounting information for calculating accruals, normal accruals and discretionary accruals is only available as of 1965, our sample period is 1965 to 2004. Figure 1 plots the time-series of the three value-weighted aggregate accrual measures, AC_VW, NAC_VW, and DAC_VW.

[8] Note that there is no intercept in the Jones' (1991) model. If we include a constant intercept into the model of accruals decomposition and accordingly form aggregate measures of components of accruals, we obtain similar results to those reported in the text. Those results are available upon request. Also note that if we include a constant intercept into the Jones' (1991) model and calculate discretionary accruals as the residuals, the value-weighted aggregate discretionary accruals are not equal to zero.

[9] Someone may argue that the Jones' (1991) model to decompose accruals into normal and discretionary components is somewhat crude so that the measure of discretionary accruals is contaminated. We discuss its impact on our results in Section 5.1.

2.2 Aggregate Market Returns and Forecasting Variables

We use CRSP's annual returns on the equal-weighted and value-weighted NYSE/AMEX indexes in excess of the one-month Treasury bill rate from 1965 to 2004. The annual returns correspond to calendar years.[10] For the purpose of multivariate analysis and robustness check, we consider several information variables at year-end known to forecast expected market returns: dividend yield, term premium, default premium, short rate and its stochastically-detrended variant, consumption-wealth ratio, and aggregate book-to-market ratio. Notice that, given some recent findings that the firm-level accruals-returns relation is a manifestation of the bigger growth-value anomaly (Fairfield, Whisenant, and Yohn, 2003; and Desai, Rajgopal, and Venkatachalam, 2004), we use the aggregate book-to-market ratio to control for the potential impact of growth on return predictability. We calculate the dividend yield (DP) as the dividends on the CRSP's value-weighted NYSE/AMEX index accumulated over the prior year (current month included) divided by this month's index level. The term premium ($TERM$) is the yield spread of a ten-year Treasury bond over a one-month Treasury bill. The default premium (DEF) is the yield spread of corporate bonds with Moody's Baa and Aaa rating. The short rate ($TB1M$) is the yield of a one-month Treasury bill, and we also calculate the stochastically-detrended short rate ($SHORT$) by subtracting from this month's short rate the average short rate over the year prior to this month (current month excluded). The consumption-wealth ratio (CAY), constructed by Lettau and Ludvigson (2000), represents deviations from a common trend found in consumption, asset wealth, and labor income. Finally, we compute each firm's book-to-market ratio as the ratio of the market value of assets to the book value of assets. The market value of assets is equal to the book value of assets (data 6) plus the market value of common equity (data 25 times data 199) less the book value of common equity (data 60) and balance sheet deferred taxes (data 74). We then aggregate across NYSE/AMEX firms to calculate the value-weighted and equal-weighted aggregate book-to-market ratios (BTM_VW and BTM_EW). Data for the stock market returns, dividend yields, and one-month T-Bill rates come from the CRSP database. The aggregate book-to-market ratio is calculated using the Compustat

[10] For robustness check, we also use NYSE/AMEX/NASDAQ index returns. Moreover, we use for our analysis the annualized NYSE/AMEX index returns in other twelve-month periods, e.g., February to January, March to February, April to March, and May to April. In all cases, we obtain qualitatively similar results. See Section 4.3 for details. Note that, to be consistent with the analysis in Section 5 where we use annual macroeconomic variables and some market-timing variables, we choose to report in the paper the results based on the calendar-year annual returns.

database. We compute term premium and default premium using the DRI database and obtain CAY from Martin Lettau's website.

Recent studies have also found that several proxies for equity market timing predict stock market returns. These variables include equity share in new issues, S (Baker and Wurgler, 2000), investor sentiment index, $SF2RAW$ (Baker and Wurgler, 2005), and aggregate corporate investment plans $GHAT$, (Lamont, 2000). We download S and $SF2RAW$ from Jeffery Wurgler's website and $GHAT$ from Owen Lamont's website.

2.3 Summary Statistics

Table 1, Panel A presents summary statistics of excess stock market returns, aggregate accrual measures, information variables, and market-timing variables used in our analysis. We elaborate on some statistics of the six value-weighted and equal-weighted aggregate accrual measures. Both the mean and the median of AC_VW are negative. The mean, median, and standard deviation of NAC_VW are all in similar magnitude to those of AC_VW, but the mean, median, and standard deviation of DAC_VW are significantly smaller in magnitudes. The three equal-weighted aggregate accrual measures exhibit similar pattern.

Despite their similarities, the value-weighted aggregate accrual measures and the equal-weighted aggregate accrual measures display significantly different behaviors as well. (Note that the value-weighting method favors large firms while the equal-weighting method favors small firms.) First, each of the three value-weighted aggregate accrual measures has a larger mean and median *in absolute value* than the corresponding equal-weighted aggregate accrual measures. Second, for value-weighted measures, the discretionary component on average accounts for $\frac{-0.704}{-4.722} = 14.91\%$ of the level of the accruals while such ratio for the equal-weighted measure is only $\frac{-0.124}{-2.826} = 4.33\%$, indicating that large firms have relatively larger discretionary accruals than small firms. Third, the standard deviations of the value-weighted aggregate accruals and the value-weighted aggregate normal accruals are smaller than the standard deviations of their equal-weighted counterparts, implying that large firms tend to have less volatile accruals and normal accruals than small firms. Fourth, the standard deviation of the value-weighted aggregate discretionary accruals is more than three times larger than that of the equal-weighted aggregate discretionary accruals. Large firms appear to have a more volatile discretionary accrual component than small firms.

Table 1, Panel B presents the (pairwise) contemporaneous correlations among all those variables. We first study the correlations among the aggregate accrual measures. The correlations among the value-weighted aggregate accrual measures are smaller than the corresponding correlations among the equal-weighted aggregate accrual measures. The correlation coefficient between AC_VW and NAC_VW (or DAC_VW) is 0.855 (0.655), and the correlation coefficient between AC_EW and NAC_EW (or DAC_EW) is 0.996 (0.763). There is a stark distinction in the correlations between the aggregate normal accruals and the aggregate discretionary accruals across the two weighting methods. The correlation coefficient is 0.703 for NAC_EW and DAC_EW but is only 0.168 for NAC_VW and DAC_VW. Interestingly, DAC_VW is negatively correlated with either AC_EW or NAC_EW and uncorrelated with DAC_EW (correlation equal to 0.085 with a p-value of 0.603). The correlation structure suggests that the aggregate discretionary accruals and the aggregate normal accruals reflect different information content of the aggregate accrual if we use the value-weighting method for aggregation, and that the two accrual components reflect more or less the same information content of the aggregate accrual if we use the equal-weighting method for aggregation.

We then focus on the correlations of the aggregate accrual measures with the other variables. Notably, regardless of the weighting schemes, the aggregate accrual measures are all significantly negatively correlated with excess market returns. For example, the correlation coefficients between the value-weighted aggregate accrual measures and the value-weighted market returns are -0.400 for AC_VW, -0.385 for NAC_VW, and -0.199 for DAC_VW, respectively; the correlation coefficients between value-weighted aggregate accrual measures and the equal-weighted market returns are -0.456 for AC_VW, -0.335 for NAC_VW, and -0.377 for DAC_VW, respectively. Both AC_VW and DAC_VW are positively correlated with the following information variables: BTM_VW, BTM_EW, DP, DEF, and CAY, with significantly higher correlation coefficients for DAC_VW. The correlation between AC_VW and $TERM$ is negative but the correlation between DAC_VW and $TERM$ is positive; the correlation between AC_VW and $SHORT$ is positive but the correlation between DAC_VW and $SHORT$ is negative but tiny. The correlation pattern of NAC_VW with the information variables resembles the pattern of AC_VW. Regarding the correlations of the aggregate accrual measures with equity timing variables, regardless of the weighting schemes, all six measures relate negatively to $SF2RAW$ and positively to $GHAT$; the equal-weighted aggregate accrual measures are positively correlated with S; the correlations between the value-weighted aggregate accrual measures and S are very small, though.

Panel C of Table 1 reports the first-order autocorrelations of these variables. Most of the information variables and equity timing proxies are quite persistent, with the first-order autocorrelations ranging from 0.449 for $TERM$ to 0.886 for BTM_VW. Stochastically-detrended short-term yield $SHORT$ and planned investment $GHAT$ have first-order autocorrelation coefficients close to zero. (The non-detrended short-term yield is highly persistent with the first-order autocorrelation at 0.778.) Compared to most of the information variables and equity-timing variables, the value-weighted aggregate accrual measures are significantly less serially correlated. The fist-order autocorrelation coefficients are 0.201 for AC_VW but insignificant (p-value=0.188), 0.365 for NAC_VW, and 0.345 for DAC_VW, respectively. In contrast, the fist-order autocorrelation coefficients of the equal-weighted aggregate accrual measures are significantly higher: 0.736 for AC_EW, 0.744 for NAC_EW, and 0.620 for DAC_EW.

3 Empirical Method

We primarily use the ordinary least-square (OLS) regression method in our paper when we study the power of aggregate accrual measures in forecasting aggregate market returns. We apply the Generalized Method of Moments (GMM) estimation method to cases in which we specify a system of equations to examine the joint dynamics of dependent variables of interest and forecasting variables. We calculate and report the Newey-West Heteroscedasticity and Autocorrelation Consistent (HAC) standard errors throughout the paper.

Several studies have found that, in a common empirical framework to study stock return predictability with scaled-price variables, there is a bias in the estimated predictive coefficient (Stambaugh, 1986, 1999; Nelson and Kim, 1993). The bias arises because the innovations in these scaled-price variables are contemporaneously correlated (negatively oftentimes) with stock returns. This bias is more pronounced when the contemporaneous correlation between the innovation terms is strong, the persistence of the predictors is high, or when the sample size is small.

In our study, the aggregate accrual measures are not scaled-price variables; the persistence of the three value-weighted accrual measures is at most mild relative to other popular scaled-price variables like dividend yield and book-to-market ratio. The bias is less of a concern. However, we do have a small sample size (40 observations) and we find empirical contemporaneous comovement of the aggregate accrual measures and the aggregate market returns. We thus follow Baker, Taliaferro and Wurgler's (2005) approach to conduct a monte-carlo analysis under the null hypothesis of no return predictability.

Specifically, we first simulate 50,000 series of EXC_VW based on the following system of equations:

$$\begin{aligned} EXC\_VW_t &= a + u_t, \quad \text{with} \quad u_t \sim i.i.d.(0, \sigma_u^2), \quad \text{and} \\ DAC\_VW_t &= c + d * DAC\_VW_{t-1} + v_t, \text{ with } v_t \sim i.i.d.(0, \sigma_v^2) \text{ and } Corr(u, v) = \rho_{u,v}. \end{aligned} \quad (3)$$

Here, EXC_VW and DAC_VW are defined as above; the parameters a and σ_u are set based on the empirical distribution of EXC_VW; the parameters c, d, and σ_v are determined based on the empirical dynamics of DAC_VW; the correlation coefficient $\rho_{u,v}$ is set to the its empirical value; the sample size is T. Specifically, a=5.864, σ_u=16.550; c=-0.461, d=0.345, σ_v=0.919; $\rho_{u,v}$=-0.198; and T=40. We then regress each series of simulated returns against DAC_VW, and we use OLS estimates of the predictive coefficient b from the 50,000 separate samples, reporting the average estimated coefficient and compare it with the actual estimation result from regressing EXC_VW against DAC_VW.

Figure 2 characterizes results of the monte-carlo analysis. Panel A reports the average estimated predictive coefficient from the 50,000 simulations versus the actual coefficient estimate from regressing EXC_VW against the one-period-lagged DAC_VW. Under the null hypothesis of no return predictability (b=0), the average estimated predictive coefficient from the 50,000 simulations is 0.138. In contrast, the actual OLS estimate of the predictive coefficient is 7.573, and the OLS Newey-West HAC standard error as reported in Table 3, Model (A.2) is 1.777, yielding a robust t-statistics at 4.26. Thus, as a point estimate, the bias accounts for only 1.82% of the discretionary aggregate accruals' actual coefficient on value-weighted excess market returns. The one-sided p-value shows that there is only a less than 0.01% probability that the bias would lead to a coefficient as large as the actual coefficient. To better illustrate the distribution of the simulated estimates of the predictive coefficient, we plot its histogram in Panel B. Clearly, the actual estimate of the predictive coefficient falls in the far right tail of the simulated distribution, leading to an outright rejection that our OLS estimation results are severely affected by this bias. In fact, the probability is so small that we can place much confidence in our empirical method and the estimation results.

4 Aggregate Accrual Measures as Return Predictors

We specify the model for stock return predictability as follows:

$$R_t = a + bX_{t-1} + u_t, \tag{4}$$

where R is the excess market return (EXC_VW or EXC_EW), and X represents a set of predictors including the lagged excess market return, various aggregate accrual measures (AC_VW, AC_EW, NAC_VW, or DAC_VW) and other well-known predictors such as aggregate book-to-market ratio (BTM_VW or BTM_EW), dividend yield (DP), term premium ($TERM$), default premium (DEF), stochastically detrended one-month T-Bill yield ($SHORT$), and consumption-wealth ratio (CAY). We estimate equation (4) with the OLS regression and calculate the Newey-West HAC standard errors.

4.1 Aggregate Total Accruals

We first examine the power of the value-weighted aggregate total accruals (AC_VW) and the equal-weighted aggregate total accruals (AC_EW) in forecasting aggregate market returns. Table 2, Panels A and B report the regression results when the value-weighted excess market return (EXC_VW) and the equal-weighted excess market return (EXC_EW) are the dependent variables, respectively.

As a prelude, we take a quick look at the forecasting power of such conventional predictors as the lagged market returns, dividend yield, term premium, default premium, and stochastically-detrended short rate (Models (1)-(2)). Almost all predictors but term premium are statistically insignificant in our sample; term premium is only significant at the 10% level in forecasting EXC_VW; and the adjusted R^2's are all negative.

We investigate the univariate analysis results with the aggregate accruals (AC_VW or AC_EW) as the return predictor (Models (3)-(4)). When AC_VW is the only forecasting variable in equation (4), the estimated predictive coefficients are respectively 2.033 in predicting EXC_VW and 5.098 for predicting EXC_EW, and both are significant at the 1% level. The adjusted R^2's are 0.027 for EXC_VW and 0.124 for EXC_EW. It appears that the value-weighted aggregate accruals have stronger power in predicting equal-weighted market returns than in predicting value-weighted market returns. A one-standard-deviation increase in AC_VW, which is 1.861%, increases EXC_VW by 3.783% and EXC_EW by 9.487%. In this simple univariate regression setting, the stock market return predictability with value-weighted aggregate accruals is both statistically and economically significant. Note that different from the firm-level or portfolio-level evidence on a negative relation between accruals and subsequent stock returns (e.g., Sloan, 1996; and Collins and Hribar, 2000), our value-weighted aggregate accruals *positively* predict subsequent aggregate stock market returns, corroborating the findings of Hirshleifer, Hou, and Teoh (2005). When we use the equal-weighted aggregate accrual AC_EW as the only forecasting variable in equation (4), the estimated predictive coefficient is insignificant and we fail to find any power of AC_EW in predicting stock market returns, as shown in Model (4) of either panel. This finding, however, is different from that in Hirshleifer, Hou, and Teoh (2005) who report their equal-weighted aggregate accrual measure to have significant power in predicting future stock market returns. This difference between their and our results stems from differences in sample constructions. If we include in our sample the firms with accrual values either below the 0.5 percentile or above the 99.5 percentile, the resulting value-weighted aggregate accrual measure retains significant return forecasting power, and the resulting equal-weighted aggregate accrual measure exhibits some return forecasting power. Because the return forecasting power of the equal-weighted aggregate accruals is likely driven by outliers, we focus on the value-weighted aggregate accrual measures in the subsequent analysis.

Stock market return predictability with AC_VW from the univariate analysis may reflect other information variables' ability to predict market returns. To study the incremental power of AC_VW to predict aggregate market returns after controlling for other known market return predictors, we conduct multivariate analysis (Models (5)-(9)). The stock market return predictability with AC_VW is robust to the inclusion of such known predictors as lagged market returns, dividend yield, term premium, default premium, stochastically-detrended short rate, aggregate book-to-market ratio, and consumption-wealth ratio. As shown in Models (5) and (6) of both panels, controlling for DP, BTM_VM or BTM_EM, $TERM$, DEF, and $SHORT$, the estimated coefficient on AC_VW

remains significant at the 1% level; except for $TERM$ which becomes significant in predicting EXC_VW, the coefficient estimates on these known predictors are all insignificant. In Models (7) and (8) of both panels, we include CAY as an additional return predictor into equation (4). Lettau and Ludvigson (2001) show that compared to other return predictors, CAY is a powerful predictor of stock market returns in short to medium horizons. We find that the value-weighted aggregate accruals remain economically and statistically significant after controlling for CAY. Model (9) from either panel shows that the equal-weighted aggregate accruals still have no power in forecasting either value-weighted or equal-weighted market returns after controlling for CAY. Consistent with the univariate analysis, we also find that in the multivariate analysis, the value-weighted aggregate accruals have a larger power in forecasting equal-weighted excess stock market returns than in forecasting value-weighted excess stock market returns.

4.2 Aggregate Normal Accruals versus Aggregate Discretionary Accruals

We analyze the forecasting power of the value-weighted aggregate measures of the two (total) accrual components, normal accruals and discretionary accruals. At the firm- and portfolio- level, Xie (2001) documents that accruals' explanatory power of future stock returns is mainly driven by the discretionary accrual component. In the same spirit, we examine whether the forecasting power of the (value-weighted) aggregate accruals is mainly due to the aggregate discretionary accruals.

4.2.1 Univariate Analysis

Table 3 reports results from the univariate analysis of predicting aggregate market returns with either aggregate normal accruals or aggregate discretionary accruals. In Panels A and B, the dependent variables are the one-year-ahead value-weighted excess stock market returns (EXC_VW) and the one-year-ahead equal-weighted excess market returns (EXC_EW), respectively. Several interesting findings emerge from Table 3.

First, the value-weighted aggregate normal accruals (NAC_VW) have no power in predicting value-weighted or equal-weighted excess market returns (Models (1)). The relevant predictive coefficient estimates are both statistically insignificant.

Second, the value-weighted aggregate discretionary accruals (DAC_VW) have strong power in forecasting stock market returns. The relevant predictive coefficient estimates are 7.573 for value-weighted market returns and 11.332 for equal-weighted market returns, respectively (Models (2)), and both are significant at the 1% level. A one-standard-deviation increase in DAC_VW, which is 0.979%, increases EXC_VW by 7.414% and EXC_EW by 11.094%. The forecasting power of DAC_VW is significantly larger than the forecasting power of AC_VW. With DAC_VW as the predictor, the adjusted R^2's from predicting EXC_VW and EXC_EW are both 0.179; in contrast, with AC_VW as the predictor, the adjusted R^2's from predicting EXC_VW and EXC_EW are respectively 0.027 and 0.124. If including both NAC_VW and DAC_VW into the forecasting equation (Models (3)), the predictive coefficient estimates on NAC_VW are insignificant, and the estimates on DAC_VW remain significant at the 1% level. Moreover, including NAC_VW as one additional predictor hurts the performance of the forecasting; the adjusted R^2's decrease slightly from the univariate prediction using DAC_VW as the only predictor.

Third, neither the equal-weighted aggregate normal accruals (NAC_EW) nor the equal-weighted aggregate discretionary accruals (DAC_EW) predict either value-weighted or equal-weighted excess market returns (Models (4)-(6)). None of the predictive coefficient estimates are significant, and the adjusted R^2's are all negative. This finding explains the lack of forecasting power of the equal-weighted aggregate accruals (AC_EW) as identified in Section 4.1.

The above evidence implies that the forecasting power of the value-weighted aggregate accruals comes not from the normal accrual component but from the discretionary accrual component. Because NAC_VW, NAC_EW, and DAC_EW all lack the power in forecasting aggregate market returns, we focus our following discussion of multivariate analysis on the value-weighted aggregate discretionary accruals (DAC_VW).

4.2.2 Multivariate Analysis

Like the multivariate analysis in Section 4.1, we include DAC_VW and those well-known return predictors into equation (4). We report such multivariate regression results in Table 4, with Panels A and B respectively containing results for value-weighted and equal-weighted excess market returns as the dependent variable. For ease of exposition, we retain as Model (1) in Table 4 the univariate regression results from Table 3.

Table 4 clearly shows that the power of DAC_VW to forecast aggregate market returns survives the multivariate analysis. Among all the predictors but CAY, and across different definitions of excess market returns, DAC_VW is the most consistent and significant return predictor (Models (2)-(4)). Except for the regression with EXC_EW as the dependent variable and the lagged EXC_EW and DAC_VW as independent variables, the adjusted R^2's of such multivariate regressions decline relative to the adjusted R^2's of the univariate regression with DAC_VW as the only independent variable.

The consumption-wealth ratio (CAY) has been found as one of the most robust predictors for stock market returns in short to medium horizons (Lettau and Ludvigson, 2001). For ease of comparison, we present in Model (5) the regression result from predicting excess market returns with CAY. We summarize as follows a few findings on the regression results with both CAY and DAC_VW as the predictors (Model (6)). First, the coefficient estimates on DAC_VW remain significant at the 5% level, but the magnitude and significance decrease relative to the univariate analysis results as reported in Model (1). Second, although the coefficient estimates on CAY are still significant, the magnitude and significance drop as well relative to the univariate analysis results as reported in Model (5). The drop in significance for coefficient estimates on both CAY and DAC_VW is probably due to the moderate and positive correlation between the two predictors (the correlation equal to 0.407). Third, although CAY forecasts a bulk of variations in expected market returns, DAC_VW offers significant forecasting power complementary to CAY. When EXC_VW is the dependent variable, DAC_VW improves the adjusted R^2 of the prediction from 0.243 to 0.298; When EXC_EW is the dependent variable, DAC_VW improves the adjusted R^2 of the prediction from 0.160 to 0.242.

Model (7) from either panel presents the regression results of including DAC_VW and all those known predictors into equation (4). The estimated predictive coefficients on DAC_VW remain significant at the 5% level, further suggesting that DAC_VW contains incremental information useful to forecast aggregate market returns.

In summary, Tables 2-4 establish three empirical facts. First, the value-weighted total accruals (AC_VW) demonstrate economically and statistically significant power in forecasting future stock market returns, while the equal-weighted total accruals do not. Second, the forecasting power of aggregate accruals derives mainly from the discretionary accrual component rather than the normal accrual component. We find that the aggregate normal accruals, value-weighted or equal-weighted, do not have any significant forecasting power. On the contrary, the value-weighted discretionary accrual (DAC_VW) significantly predicts one-year-ahead excess stock market returns. Third, the forecasting power of the value-weighted discretionary accruals is robust to inclusion of other information variables, including CAY, which are known to predict future marker returns.

4.3 Robustness Checks

In our analysis above, we use the calendar-year returns on the NYSE/AMEX index; we follow Sloan (1996) to calculate accruals and use the cross-sectional version of the Jones' (1991) model to decompose accruals. For robustness analysis, we use market returns measured in different periods and across different exchanges; we follow Teoh, Welch, and Wong (1998) to calculate accruals; and we adopt the time-series version of the Jones' (1991) model to decompose accruals. Table 5A reports the predictive regression results when we use the annualized NYSE/AMEX index returns measured in other 12-month periods, e.g., February to January, March to February, April to March, and May to April, as the dependent variable and variants of aggregate discretionary accruals as the independent variable. The results clearly show that all of the value-weighted aggregate discretionary accruals, calculated with different approaches, significantly and positively predict different sets of one-year-ahead market excess returns. We also extend the study of the predictive relation beyond the NYSE/AMEX firms and reports the regression results in Table 5B. When we calculate aggregate accruals and aggregate discretionary accruals for the universe of NYSE/AMEX/NASDAQ firms, the value-weighted aggregate discretionary accruals significantly and positively predict either NYSE/AMEX index returns or NYSE/AMEX/NASDAQ index returns, but the equal-weighted aggregate discretionary accruals do not have any predictive power at all. Also, when we use the aggregate discretionary accruals for the universe of NYSE/AMEX firms as the return predictor and the NYSE/AMEX/NASDAQ index returns as the dependent variable, once again, the value-weighted but not the equal-weighted aggregate discretionary accruals have significant predictive power.

We conduct several other robustness checks as well. Because our sample covers the period from 1965 to 2004 and we only have 40 observations, it is possible that some outliers are driving our results.[11] Our previous simulations show that our results are not severely affected by the small-

[11] Butler, Grullon and Weston (2005) argue that the equity market timing evidence reported in Baker and Wurgler (2000) — managerial decision to time equity markets to issue equity predicts stock market returns — was driven by outliers.

sample bias. Apart from the monte-carlo analysis, we apply several filters to the sample. For example, we drop years with significantly negative excess market returns (1969, 1970, 1972, 1973, 1981, 1990, and 2002); we delete the observations from 2000 to 2004 to control for the influence of the internet bubble and the subsequent burst. In each case we re-estimate equation (4) on the truncated samples and obtain similar results. For brevity we do not report these results in the text.

5 What Accounts for Aggregate (Discretionary) Accruals' Forecasting Power?

The value-weighted accruals (AC_VW) and, in particular, the value-weighted discretionary accruals (DAC_VW) have significant power in forecasting future stock market returns. We offer several possible explanations in this section. We start with one statistical argument followed by several possible economic explanations. We rule out other explanations and conclude that the finding is most likely consistent with the story of managers timing aggregate equity market to manage earnings.

5.1 Measurement Error

As defined in equation (2), the firm-level discretionary accruals are the residuals of the cross-sectional regressions of firm accruals against firm-level sales revenue changes and PPE. (The firm-level normal accruals are the fitted values of such regressions). The regression residuals might not be perfectly orthogonal to the explanatory variables, so the discretionary accruals might be contaminated by some components of the normal accruals. Consequently, the value-weighted discretionary accruals (DAC_VW) likely contain a measurement error. In the univariate return forecasting equation with DAC_VW, the measurement error introduces a downward bias to our predictive coefficient estimate. Given that our predictive coefficient estimate with the potentially contaminated DAC_VW variable is positive and strongly significant, the forecasting power of a clean DAC_VW variable could be stronger. Because Thomas and Zhang (2002) find that the accrual anomaly is mainly related to inventory, another concern about the Jones' (1991) model is that the model of firm-level accrual decompositions is so crude that the residuals, the discretionary accruals, may simply reflect increases in inventory that are unrelated to contemporaneous sales.

To address this concern, we analyze whether the aggregate measures of each balance-sheet item of accruals as defined in equation (1), inventory in particular, can predict future stock market returns. We do not find any item to have significant return forecasting power. For brevity we do not report those results and they are available upon request.

With the statistical argument ruled out, two competing theories emerge as potential economic explanations of our empirical findings: market-efficiency based arguments; and market-inefficiency based arguments.

5.2 Market Efficiency Arguments

The efficient market theory implies that aggregate accruals predict stock returns because either (1) some omitted factors are driving both aggregate accruals and the next-period market returns; or (2) aggregate accruals mainly reflect business conditions and thus capture information on economic activities which predict stock market returns. In the second case, aggregate (discretionary) accruals are just proxies for economic fundamentals. Therefore, the fact that the aggregate accruals predict aggregate market returns does not by itself demonstrate market inefficiency.

5.2.1 Omitted Factors Hypothesis

One plausible explanation of our empirical findings is that some hidden underlying economic force is driving both value-weighted aggregate (discretionary) accruals and next-period aggregate market returns in the same direction, so we observe a significant and positive predictive relation between the two. The multivariate analysis above, with which we try to control for all well-known proxies for the time-varying risk premium, yields results similar to the univariate analysis and thus, to some extent, mitigates the omitted-factors concern. However, unless we are 100% sure that those additional variables are perfect proxies for the underlying economic force, we may still suffer from the critique.

We use a *bi-directional* Granger causality test to address the omitted-factors concern. If the omitted-factors story is true, then the underlying economic force that is responsible for the forecasting power of aggregate (discretionary) accruals on aggregate market returns should also produce a predictive relation from aggregate market returns to aggregate (discretionary) accruals. In turn, statistically, we should observe a bi-directional Granger causality between the aggregate (discretionary) accruals and the aggregate market returns. Table 6 reports the results of the bi-directional Granger causality test.

We first test the null hypothesis that there is no bi-directional Granger causality between the value-weighted accruals (AC_VW) and the aggregate stock market returns. Panel A reports the testing results with the value-weighted excess stock market return (EXC_VW). The results show that we can not reject the null hypothesis. The hypothesis testing that AC_VW does not Granger cause EXC_VW has a p-value at 0.181, and the hypothesis testing that EXC_VW does not Granger cause AC_VW has a p-value at 0.774. Panel B reports the testing results with the equal-weighted excess stock market return (EXC_EW). We can reject that null that AC_VW does not Granger cause EXC_EW (p-value=0.007), but we can not reject the null that EXC_EW does not Granger cause AC_VW (p-value=0.799).

We then test the null hypothesis that there is no bi-directional Granger causality between the value-weighted discretionary accruals (DAC_VW) and the aggregate stock market returns. Panels C and D report the testing statistics with the value-weighted excess stock market returns (EXC_VW) and the equal-weighted excess stock market returns (EXC_EW), respectively. We soundly reject the null hypothesis that DAC_VW does not Granger cause EXC_VW (p-value=0.005), but we cannot reject the null that EXC_VW does not Granger cause DAC_VW (p-value=0.586). Similarly, we can more readily reject that null that DAC_VW does not Granger cause EXC_EW (p-value=0.002), but we again can not reject the null that EXC_EW does not Granger cause DAC_VW (p-value=0.176).

Overall, there is only one-directional Granger causality from the value-weighted (discretionary) accruals to the aggregate stock market return but not the other way around. The omitted-factor story, which implies a bi-directional Granger causality between the two, lacks the empirical support. The testing results also clearly show that the value-weighted aggregate discretionary accruals more strongly Granger cause the aggregate stock market return than the valued-weighted aggregate accruals.

5.2.2 Aggregate Accrual Measures as Proxies for Business Conditions

We now examine another market-efficiency based explanation — aggregate accruals or aggregate discretionary accruals reflect overall business conditions. The aggregate accrual measures might be better proxies for economic activities than other know variables used in our analysis, so they are able to better predict aggregate stock market returns. Our empirical evidence so far does not provide support for this explanation. The accruals literature documents that the normal accruals reflect business conditions while the discretionary accruals measure managerial earnings management at the firm- and portfolio- level (see, e.g., Xie, 2001). It is likely that the normal accruals outperform the discretionary accruals in reflecting the overall business conditions at the aggregate level. Taking this belief for granted, if the forecasting power of the aggregate accruals is due to the fact that they reflect business conditions, we should expect the aggregate normal accruals but not the aggregate discretionary accruals to predicts aggregate stock market returns. However, the results from Tables 3 and 4 clearly show that the aggregate normal accruals do not have predictive power at all. Instead, it is the (value-weighted) aggregate discretionary accruals that drive the predictive power of the aggregate accrual. Moreover, the aggregate discretionary accruals demonstrate much stronger power in forecasting aggregate market returns than the aggregate accruals.

We provide one piece of evidence that the aggregate normal accruals reflect information about the overall business condition while the aggregate discretionary accruals do not. We use the annual GDP growth rate ($GDPG$) as one proxy for the overall economic condition. If the aggregate accruals and the aggregate normal accruals truly reflect business conditions and capture information about economic activities, we expect them to have some power in forecasting $GDPG$.

We run several OLS regressions (with Newey-West HAC standard errors) based on the following model:

$$GDPG_t = a + bX_{t-1} + v_t, \tag{5}$$

where $GDPG$ is the annual GDP growth rate, X is a set of lagged predictors including the annual growth rate in industrial product (IPG), the three value-weighted aggregate accrual measures (AC_VW, NAC_VW, and DAC_VW), and the aggregate market returns (EXC_VW, and EXC_EW). We include IPG and EXC_VW (or EXC_EW) in equation (5) because the macroeconomics literature has identified these two variables as two predominant predictors for the GDP growth rate. We obtain $GDPG$ and IPG from the Bureau of Economic Analysis website. Table 7 contains such regression results.

Model (1) uses IPG as the sole predictor. Consistent with the macroeconomics literature, IPG

has significant power in positively predicting $GDPG$ with an adjusted R^2 of 0.345. In models (2)-(4), we separately add AC_VW, NAC_VW, and DAC_VW, along with IPG, into equation(5). The estimated coefficients on AC_VW and NAC_VW are both negative and significant at the 5% level, and the estimated coefficient on DAC_VW is still negative but insignificant. The negative coefficient implies that higher aggregate accrual measures predict a lower future GDP growth rate, which is consistent with a positive predictive relation between the aggregate accrual measures and the expected market risk premium because the market risk premium is found to be high when the macroeconomy is weak (Fama and French, 1989). Moreover, the adjusted R^2's of the predictive regressions respectively improve from 0.345 to 0.374 with AC_VW and from 0.345 to 0.394 with NAC_VW, suggesting that both AC_VW and NAC_VW contain useful incremental information about the economic conditions; in contrast, the adjusted R^2 of the regression with DAC_VW as one predictor decreases from 0.345 to 0.306, suggesting that DAC_VW does not contain incremental information about the macroeconomy. Instead, DAC_VW appears to introduce into the GDP forecasting some noises about the macroeconomy, leading to a lower adjusted R^2. This also explains why NAC_VW better predicts $GDPG$ than AC_VW and illustrates that AC_VW as a proxy for business conditions is due to its normal component.[12] In model (5), we include IPG, NAC_VW and DAC_VW into the forecasting. The estimated coefficient on NAC_VW is still significant at the 10% level and the estimated coefficient on DAC_VW remains insignificant. Compared to model (3) where DAC_VW is not included as one predictor, model (5) has a lower adjusted R^2 (0.377), corroborating the evidence that NAC_VW contains information about the overall economic conditions while DAC_VW does not.

Besides IPG and the three value-weighted aggregate accrual measures, we also separately include into the forecasting EXC_VW (models (6)-(8)) and EXC_EW (models (9)-(11)) as one additional predictor. Again, consistent with the prior studies, the aggregate market return has significant power in forecasting $GDPG$. Each estimated coefficient on the aggregate market return, value-weighted or equal-weighted, is positive and significant at the 1% level. Their adjusted R^2's jump to around 0.50 or higher. Interestingly, when combined with the aggregate market return, none of the coefficient estimates of the three value-weighted aggregate accrual measures remain

[12]We also include other variables such as CAY into equation (5) to predict $GDPG$ and obtain quantitatively similar results. We do not report them for brevity.

significant. This finding suggests that the aggregate market return subsumes the information contained in AC_VW or NAC_VW about the overall economic conditions.

5.3 Market Inefficiency Arguments

5.3.1 Evidence of Market Inefficiency

Following Fama and Schwert (1977), Fama and French (1988), Kothari and Shanken (1997), and Baker and Wurgler (2000), we check whether the aggregate discretionary accruals regression models forecast significantly negative stock market returns. If the market efficiency models are valid, we should not expect a significantly negative market risk premium because the stock market must be a hedge against aggregate consumption for a rational model to predict negative returns.

We run a univariate regression of the value-weighted excess market returns (EXC_VW) or the equal-weighted excess market returns (EXC_EW) against the value-weighted discretionary accruals (DAC_VW). We report in Table 8 the actual returns (columns (1) and (3)) and the predicted returns (columns (2) and (4)) from 1965 to 2004. Figure 2 plots both actual and predicted excess stock market returns. When EXC_VW is the dependent variable, 12.82% of the thirty-nine market risk premium forecasts are negative. Specifically, DAC_VW predicts negative excess market returns for five years: 1966, 1968, 1969, 1970, and 2002. In four of these five years, 1966, 1969, 1970, and 2002, the actual value-weighted excess market returns are also negative. When EXC_EW is the dependent variable, we again find negative excess return forecasts for the same five years; and in the same four years out of the five years, the actual equal-weighted excess market returns are negative.

We compare our results to Kothari and Shanken (1997) and Baker and Wurgler (2000). Kothari and Shanken (1997) find that the aggregate book-to-market ratio forecasts a significantly negative market return in 1930. Baker and Wurgler (2000) report that the equity share in new issues predicts negative market returns for six years: 1929, 1930, 1934, 1982, 1983, and 1984, for the period between 1928 and 1997, and the actual (real) returns are negative only in three years, 1929, 1930, and 1984. The value-weighted discretionary accruals used in our analysis predict more negative equity market premium than either the aggregate book-to-market ratio or the equity share in new issues.

5.3.2 Managerial Equity Market Timing

The negative market risk premium forecasts cast a doubt on market efficiency and provide evidence of market inefficiency. We go one step further to examine the market-inefficiency argument which is likely to explain the forecasting power of the aggregate accrual measures.[13] The accounting literature interprets accruals, and particularly discretionary accruals, as measures of earnings management. The market return predictability literature documents numerous evidence that the market risk premium is varying over time. Based on the two literatures, our empirical findings suggest that firm managers time the aggregate equity market to manage earnings. That is, sensing an increase in the next-period's market risk premium, firm mangers increase the levels of (discretionary) accruals today. Moreover, everything else equal, an expected increase in the future risk premium (hence the discount rate) lowers today's market valuation. If firm managers manage earnings in response to shifts in aggregate market valuations, then managers adjust up the accruals to inflate the concurrent earnings when the current market valuation drops. If such managers' behaviors are correlated (for whatever reasons) across firms, we then expect a negative relation between aggregate (discretionary) accruals and contemporaneous aggregate market returns.

To examine the contemporaneous relations between the aggregate accrual measures and the aggregate market return, we specify the following system of equations:

$$R_t = \alpha + \beta v_t + \epsilon_t, \quad (6)$$

$$F_t = \theta + \gamma F_{t-1} + v_t. \quad (7)$$

Here, the symbol R is a measure of aggregate stock returns (EXC_VW or EXC_EW). The symbol F represents the set of variables including the three value-weighted aggregate accrual measures (AC_VW, NAC_VW, and DAC_VW), term premium ($TERM$), default premium (DEF), short-term interest rate ($TB1M$), and consumption-wealth ratio (CAY). We do not include into the

[13] In cross-section accruals *negatively* predict stock returns (see, e.g., Sloan, 1996; Xie, 2001). One popular behavioral explanation is the so-called "extrapolation error hypothesis". Sloan (1996) suggests that accruals are too sophisticated for investors to fully understand. Investors over-extrapolate past growth to form exaggerated expectations about future growth. Consequently, investors tend to overvalue firms with high accruals, leading to a negative relation between accruals and future returns at the firm- and portfolio-level. If extending this argument to the aggregate level, we expect to observe a high aggregate accrual followed by a low aggregate stock market return in the future, which is opposite to our finding of a positive relation between the two. We thus rule out the extrapolation error hypothesis as one possible explanation of our finding, and we offer further discussions on the two qualitatively different accrual-return relations in Section 7.

system the dividend yield (DP) or the aggregate book-to-market ratio (BTM_VW or BTM_EW) because the two variables are, by construction, mechanically related to the contemporaneous aggregate stock returns. The variable v represents innovations in the set of variables F; we do not observe these innovations and can only estimate them from equation (7). To avoid introducing the estimation error from calculating these innovations into the estimation of equation (6), we apply the GMM estimation to the system of equations and estimate equations (6) and (7) simultaneously. We calculate the GMM Newey-West HAC standard errors for parameter estimates. To save space, we only report the estimates of equation (6) in Table 9, Panel A.

We start with the results for EXC_VW as the dependent variable of equation (6). When the innovations in the three aggregate accrual measures separately enter as the sole independent variable into equation (6), both the innovation in AC_VW and the innovation in DAC_VW are negatively and significantly, at the 1% level, related to EXC_VW, and the respective adjusted R^2's are 0.237 and 0.311; in contrast, the innovation in NAC_VW is unrelated to EXC_VW at all, and the adjusted R^2 is negative. After we add innovations in other variables into equation (6), the estimated coefficient on the innovation in NAC_VW is still insignificant, and the coefficient estimates on the innovation in AC_VW and DAC_VW remain negative and significant at the 1% level. Moreover, when these other innovations enter into equation (6) with the innovation in DAC_VW, the adjusted R^2 decreases by 6.8% to 0.243.

We obtain the similar results when EXC_EW is the dependent variable of equation (6). The innovation in NAC_VW alone is insignificantly related to the contemporaneous market return and becomes significantly related only through other innovations. The innovations in AC_VW and DAC_VW both negatively and significantly correlate with the contemporaneous market return, with or without other innovations; including other innovations as additional independent variables reduce the adjusted R^2's from 0.461 to 0.411 for the innovation in AC_VW and from 0.494 to 0.311, respectively.

We extend the above analysis to study the relation between the innovations in the three aggregate accrual measures and the contemporaneous macroeconomic variable such as the annual GDP growth rate ($GDPG$). We replace R in equation (6) with $GDPG$ and carry out the GMM estimation on the system. Table 9, Panel B reports the estimation results. Interestingly, the innovation in NAC_VW positively and significantly correlates with the current GDP growth rate, regardless whether or not we control for the impact of the innovations in other business-condition variables. The innovation in DAC_VW is slightly significantly correlated with the current GDP growth rate only through its correlation with innovations in other business-condition variables. The innovation in AC_VW appears to derive its correlation with the current GDP growth rate through its normal component. For a robustness check we also include the current annual industrial product growth rate (IPG) into equation (6) and find the same results.

In summary, there is a significant negative relation between the aggregate accruals, the aggregate discretionary accruals in particular, and the contemporaneous aggregate excess market returns. This evidence, together with the finding of a positive predictive relation between the aggregate (discretionary) accruals and the next-period's aggregate excess market returns, favors the managerial equity market timing story. The story receives a further boost with the finding that there is little correlation between the aggregate discretionary accruals and the contemporaneous GDP growth rate but there is a strong correlation between the aggregate normal accrual and the contemporaneous GDP growth rate.

6 Further Discussion on Managerial Equity Market Timing

6.1 Aggregate Discretionary Accruals versus Other Market-timing Variables

A growing empirical literature has found that firm managers are able to time the equity market to make corporate decisions and that proxies for managerial market-timing decisions predict aggregate stock market returns. A few such variables are equity shares in new issues (Baker and Wurgler, 2000), corporate investment plans (Lamont, 2000), aggregate insider trading (Seyhun, 1992; Lakonishok and Lee, 2001), and investment sentiment measures (Baker and Wurgler, 2005). The above evidence suggests that the value-weighted aggregate discretionary accruals, a measure of earnings management at the aggregate level, serves as another proxy for managerial equity market timing decisions so that the variable forecasts aggregate stock market returns. Earnings management is a routine business subject to a great deal of managerial discretion. This activity is carried out on a quarterly or annual basis and is expected to be more cost-effective than other market-timing decisions like corporate investment plans or new equity issues. Intuitively, if the value-weighted aggregate discretionary accruals (DAC_VW) derive its return forecasting power from firm managers' market timing abilities to manage earnings, then we expect this measure to have a robust and significant power in forecasting aggregate stock market returns after controlling for those other proxies for managerial equity market timing decisions.

To test this intuition, we add into the right-hand side of the return forecasting equation (4) the following proxies for managerial equity market timing decisions known to predict aggregate stock market returns: equity shares in new issues (S), planned investment growth ($GHAT$), and investment sentiment ($SF2RAW$). We report the estimation results in Table 10. Panels A and B respectively correspond to the value-weighed and equal-weighted excess stock market returns as the dependent variables. For ease of comparison, we include the estimation results with DAC_VW as the only return predictor (from Table 4, model (1)) as model (1) of Table 10. We use models (2), (5) and (8) to reproduce regressions for the equity share, investment sentiment, and planned investment as the sole return predictor, respectively.

Panel A clearly shows that DAC_VW is a robust return predictor and has significant incremental power in forecasting EXC_VW. After controlling for the impacts of those other market-timing proxies, the estimated predictive coefficient on DAC_VW are all positive and significant at least at the 5% level. It's important to point out that DAC_VW has significant predictive power incremental to $GHAT$. Frank (2006) finds that at firm-level, accruals and, as a result, discretionary accruals calculated using the Jones' (1991) model, contain information about fundamental investment. If the aggregate discretionary accruals mainly characterize information on investment, then we expect DAC_VW to lose its significant return predictive power to the planned investment, $GHAT$, which is not the case here. (Table 1, Panel B reports that the correlation between DAC_VW and $GHAT$ is 0.232.) The improvement of the return forecasting power is dramatic after including DAC_VW into the return forecasting model. With DAC_VW as one additional return predictor, the estimated coefficient on S remains negative and significant, and the adjusted R^2 improves from 0.068 of the univariate regressions to 0.259 (model (3)); the estimated coefficient on $SF2RAW$ remain negative and insignificant (model (6)); in a shorter sample of 1965-1994 (due to data availability of $GHAT$), the estimated coefficient on $GHAT$ remains negative and significant, and the adjusted R^2 improves from 0.179 of the univariate regressions to 0.285 (model (9)). Note that, for each of the four market-timing variables DAC_VW, S, $SF2RAW$ and $GHAT$, the univariate analysis with DAC_VW produces the highest fit of model. The results stand if we further control for the impacts of the business-condition variables known to predict the time-varying risk premium.

Panel B illustrates a similar pattern in the results of forecasting EXC_EW. The estimated predictive coefficient on DAC_VW are all positive and significant at least at the 5% level, except when DAC_VW is combined with $GHAT$ and all business-condition variables to enter into the return forecasting model. In the latter case, the estimated coefficient is positive but insignificant, which may reflect the impressive power of investment plan in forecasting (equal-weighted) market returns between 1965 and 1994 (Lamont, 2000).

6.2 Aggregate Discretionary Accruals as a Return Predictor: Small, Medium, and Large Firms

The summary statistics from Table 1, Panel A, on the value-weighted aggregate accrual and the equal-weighted aggregate accruals indicate that large firms tend to have larger discretionary accruals than small firms. We find that the value-weighted aggregate discretionary accruals have significant return forecasting power while the equal-weighted aggregate discretionary accruals do not show any return forecasting power. This result suggests that managers of large firms enjoy stronger abilities in timing equity markets (to manage earnings) than managers of small firms. To buttress our inference, we divide the universe of firms into small, medium, and large firms based on their market values at the beginning of each year, and we separately study the return predictive power of aggregate discretionary accruals of the three groups of firms.

Table 11, Panel A reports the univariate regression results using the three aggregate discretionary accruals as the predictor of the value-weighted market returns. The value-weighted aggregate discretionary accruals of large firms, DAC_VW_L, has significant power in predicting the equity premium. The estimated coefficient from this regression is 7.332 (t=4.30). The adjusted R^2 of this regression is 0.182, slightly higher than the adjusted R^2 of the predictive regression with the aggregate discretionary accruals of all firms. The equal-weighted aggregate discretionary accruals of large firms, DAC_EW_L, retains somewhat but much weaker power in predicting the equity premium; its estimated coefficient is positively and marginally significant, and the adjusted R^2 is only 0.004. In contrast, the value-weighted and equal-weighted aggregate discretionary accruals of either small firms or medium firms do not have return predictive power at all. Panel B offers similar evidence when we predict the equal-weighted market excess returns with the aggregate discretionary accruals of small, medium, and large firms. For example, the estimated predictive coefficient on DAC_VW_L is 10.950 (t=3.87) with the adjusted R^2 equal to 0.181.

7 (Discretionary) Accrual-Return Relations: Macro versus Micro

We have so far reported strong and robust evidence that the (discretionary) accrual-return relation at the aggregate level is significantly positive. Numerous studies in accounting have found that this relation at the firm- or portfolio- level is significantly negative (see, e.g., Sloan, 1996; Collins and Hribar, 2000; and Xie, 2001). Are these two sets of results are contradictory to each other? In this section, we go one step further toward reconciling the two qualitatively different relations by offering some evidence that the two relations can cohabit in a unified empirical framework.

Inspired by Lamont and Stein (2006), we run a predictive regression, for each firm, of the firm's stock returns against its one-year-lagged discretionary accruals and/or one-year-lagged value-weighted aggregate discretionary accruals in the 1965-2004 period. For the sake of estimation, we require a firm to have at least ten observations of data over the sample period. We then summarize and examine the properties of the estimation results from the cross-section of firm-level predictive regressions.

Table 12 reports the cross-sectional averages, t-values of the cross-sectional averages, and the cross-sectional medians of the estimation results from the firm-level predictive regressions. In Panel A, we use firms' annual returns measured in a calendar year. When we use the firm-level discretionary accruals as the sole return predictor, the cross-sectional average value of this predictive coefficient is -0.514 with a t-value of -4.659, and the cross-sectional median value is -0.393. This finding is consistent with the firm-level accrual-return relation documented in the accounting literature. When we use the value-weighted aggregate discretionary accruals as the sole return predictor, the cross-sectional average value of this predictive coefficient is 17.804 with a t-value of 20.405, and the cross-sectional median value is 16.548. This finding corroborates the above evidence on the aggregate-level accrual-return relation. When we jointly use both firm-level discretionary accruals and aggregate discretionary accruals as return predictors, the cross-sectional average values (medians) of the two predictive coefficients are -0.512 (-0.471) for the firm-level discretionary accruals and 18.215 (17.044) for the aggregate discretionary accruals, respectively, and both coefficient estimates are strongly significant. This result manifests that the two qualitatively different accrual-return relations at the disaggregate level and at the aggregate level cohabit in a unified empirical framework, suggesting that there may exist one theoretic framework in which the two relations are reconciled.

Interestingly, the two predictive coefficients on the firm-level discretionary accruals and the aggregate discretionary accruals are different in magnitudes of orders. Because the firm-level discretionary accruals and the aggregate discretionary accruals average at -0.120 and -0.535, respectively,[14] the magnitude of differences between the two predictive coefficient estimates is not due to scaling. Instead, the impact of the aggregate discretionary accruals on firm returns is even stronger if we take into account the difference in the mean levels of the two predictors. On average, the magnitude in responses of firm returns to a one-standard-deviation change in the aggregate discretionary accruals is about 35 to 40 times of the magnitude in responses of firm returns to a one-standard-deviation change in the firm-level discretionary accruals.

There is also clear evidence that the aggregate discretionary accruals and the firm-level discretionary accruals have starkly different power in forecasting firm-level returns. When we use the firm-level discretionary accruals as the sole predictor, the cross-sectional average and median values of the adjusted R^2s are only 0.007 and -0.022, respectively; in contrast, when we use the aggregate discretionary accruals as the sole predictor, the cross-sectional average and median values of the adjusted R^2s are 0.059 and 0.006, respectively. If we jointly use both the firm-level discretionary accruals and the aggregate discretionary accruals as the return predictors, the cross-sectional average and median values of the adjusted R^2s are 0.068 and 0.033, respectively. The multivariate regression results further illustrate that the aggregate discretionary accruals outweigh the firm-level discretionary accruals in forecasting firm-level returns.

For robustness, we also use annualized stock returns measured over the April-to-March period as the dependent variable of the predictive regression, and we report the cross-sectional summary results in Panel B. The results from Panel B are very similar to those in Panel A. In summary, we document different behaviors of the aggregate and firm-level discretionary accruals in forecasting

[14]The statistics here is slightly different from the statistics reported in Table 1 because of differences in sample construction.

firm-level stock returns, lending support to Samuelson's (1998) conjecture that the aggregate market behavior can differ from the individual stock price behavior and that modern financial markets display considerable macro inefficiency. Our study also sheds light on reconciling the two qualitatively different accrual-return relations in a unified theoretic framework, which warrants a further study in a separate project.

8 Conclusion

In this paper, we empirically examine the power of aggregate accruals and aggregate discretionary accruals in predicting one-year-ahead aggregate stock market returns in excess of risk-free returns (i.e., the equity market risk premium). We show that the value-weighted aggregate accruals have economically and statistically significant return forecasting power. We find that such return forecasting power is mainly due to the discretionary accrual component of large firms. The return forecasting power of aggregate discretionary accruals is stable and robust, particularly to different ways to measure market returns and discretionary accruals. We explore various possible explanations for such return predictability, and we conclude that the most credible explanation for the forecasting power of the aggregate discretionary accruals is that firm managers time equity markets to manage earnings. After controlling for other well-known equity market timing variables, the aggregate discretionary accruals retain significant return forecasting power.

Not only do we document a strongly positive (discretionary) accrual-return relation at the aggregate level, which is *qualitatively* different from this relation at the disaggregate level, but we also show evidence that the two qualitatively different relations can coexist in a unified empirical framework, moving one step further toward fully reconciling the qualitative differences. We further demonstrate that this (discretionary) accrual-return relation at the aggregate level is stronger in magnitude of orders than the relation at the disaggregate level and that the aggregate discretionary accruals outweigh the firm-level discretionary accruals in forecasting firm-level returns, suggesting that firms (or investors) respond asymmetrically to market-wide shocks versus non-market-wide shocks. Our study thus offers support to Samuelson's (1998) conjecture that aggregate stock market behavior could differ from individual stock price behavior and that modern markets demonstrate considerable *macro* inefficiency.

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Table 1. Summary Statistics

This table reports summary statistics of variables used in our empirical study: value-weighted and equal-weighted annual NYSE/AMEX market returns in excess of one-month T-Bill rates (EXC_VW, EXC_EW), aggregate accruals (AC_VW, AC_EW), aggregate normal accruals (NAC_VW, NAC_EW), aggregate discretionary accruals (DAC_VW, DAC_EW), book-to-market ratio (BTM_VW, BTM_EW), annual dividend yield (DP), term premium of ten-year T-Bond yields over one-month T-Bill yields at year-end (TERM), default premium of Baa-rated corporate bond yields over Aaa-rated corporate bond yields at year-end (DEF), stochastically-detrended one-month T-Bill yield (SHORT), consumption-wealth ratio (CAY), equity issue (S), investor sentiment measure (SF2RAW), and planned investment growth (GHAT). Market returns, dividend yields, and one-month T-Bill rates are calculated using the CRSP database; accruals measures and book-to-market ratios are calculated using the Compustat database; term premium and default premium are obtained using the DRI database; consumption-wealth ratio is downloaded from Martin Lettau's website; equity share and investor sentiment index are obtained from Jeffery Wurgler's website; and planned investment growth is downloaded from Owen Lamont's website. The sample period is 1965-2004 (40 observations) except for CAY (1965-2001, 37 observations), for S and SF2RAW (1965-2003, 39 observations), and for GHAT (1965-1994, 29 observations). Panel A reports summary statistics of each variable. All variables are in percentage. Panel B reports the (pairwise) correlations of those variables. Panel C reports the first-order autocorrelations of each variable with p-values reported in parentheses.

Panel A. Summary Statistics of the Key Variables

	Mean	Median	Standard Dev.	Minimum	Maximum
EXC_VW	5.864	9.968	16.550	-35.311	31.888
EXC_EW	10.510	13.620	24.985	-41.795	73.282
AC_VW	-4.722	-4.861	1.861	-10.014	1.340
NAC_VW	-4.017	-4.265	1.428	-6.406	1.019
DAC_VW	-0.704	-0.560	0.979	-4.509	1.025
AC_EW	-2.862	-3.502	2.396	-6.991	3.285
NAC_EW	-2.734	-3.306	2.198	-6.195	3.246
DAC_EW	-0.124	-0.121	0.294	-0.797	0.472
BTM_VW	0.700	0.665	0.151	0.449	0.960
BTM_EW	0.834	0.824	0.151	0.517	1.248
DP	3.259	3.233	1.108	1.478	5.293
TERM	1.381	1.455	1.489	-2.650	3.550
DEF	1.091	0.970	0.452	0.340	2.320
SHORT	0.063	-0.022	1.651	-3.988	6.411
CAY	-0.176	0.433	1.619	-5.107	2.809
S	18.889	16.306	8.784	7.451	43.001
SF2RAW	0.081	0.034	0.982	-1.798	2.327
GHAT	4.102	4.012	5.096	-11.029	17.147

Panel B. (Pairwise) Correlations

	EXC_VW	EXC_EW	AC_VW	NAC_VW	DAC_VW	AC_EW	NAC_EW	DAC_EW	BTM_VW	BTM_EW	DP	TERM	DEF	SHORT	CAY	S	SF2RAW	GHAT
EXC_VW	1.000																	
EXC_EW	0.807	1.000																
AC_VW	-0.400	-0.456	1.000															
NAC_VW	-0.385	-0.335	0.855	1.000														
DAC_VW	-0.199	-0.377	0.655	0.168	1.000													
AC_EW	-0.291	-0.129	0.380	0.701	-0.300	1.000												
NAC_EW	-0.267	-0.089	0.356	0.695	-0.336	0.996	1.000											
DAC_EW	-0.392	-0.408	0.499	0.592	0.085	0.763	0.703	1.000										
BTM_VW	-0.144	-0.066	0.278	0.004	0.522	0.028	-0.018	0.343	1.000									
BTM_EW	-0.368	-0.301	0.474	0.187	0.628	-0.017	-0.071	0.369	0.774	1.000								
DP	-0.247	-0.123	0.368	0.205	0.399	0.291	0.249	0.505	0.947	0.733	1.000							
TERM	0.032	0.148	-0.330	-0.524	0.135	-0.562	-0.554	-0.472	0.065	-0.017	-0.083	1.000						
DEF	-0.168	-0.113	0.041	-0.230	0.413	-0.220	-0.256	0.105	0.666	0.595	0.587	0.144	1.000					
SHORT	0.166	0.067	0.231	0.307	-0.008	0.275	0.267	0.248	0.026	0.055	0.047	-0.687	-0.240	1.000				
CAY	-0.131	-0.080	0.252	0.048	0.407	-0.123	-0.124	-0.084	0.542	0.339	0.519	0.340	0.192	-0.069	1.000			
S	-0.122	-0.074	-0.030	-0.054	0.021	0.154	0.101	0.485	0.424	0.342	0.395	-0.012	0.411	0.017	-0.076	1.000		
SF2RAW	-0.049	-0.130	-0.484	-0.459	-0.255	-0.192	-0.195	-0.135	-0.120	-0.410	-0.194	0.108	0.136	-0.184	-0.160	0.246	1.000	
GHAT	-0.456	-0.537	0.494	0.484	0.232	0.335	0.323	0.345	-0.055	-0.088	0.031	-0.178	-0.290	0.090	0.060	-0.118	0.115	1.000

Panel C. First-order Autocorrelations

EXC_VW	EXC_EW	AC_VW	NAC_VW	DAC_VW	AC_EW	NAC_EW	DAC_EW	BTM_VW	BTM_EW	DP	TERM	DEF	SHORT	CAY	S	SF2RAW	GHAT
-0.064	0.006	0.201	0.365	0.345	0.736	0.744	0.620	0.886	0.792	0.847	0.449	0.607	0.062	0.614	0.687	0.685	0.011
(0.672)	(0.967)	(0.188)	(0.016)	(0.024)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.683)	(0.000)	(0.000)	(0.000)	(0.952)

Table 2. Aggregate Accruals as Stock Market Return Predictors

This table reports estimation results of regressing market returns against various one-period-lagged predictors. The sample periods are 1965-2004 for models (1)-(6) and 1965-2002 for models (7)-(10). The New-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Panel A. EXC_VW as Dependent Variable

Model	INTERCEPT	EXC_VW	AC_VW	AC_EW	BTM_VW	DP	TERM	DEF	SHORT	CAY	ADJ. R^2
(1)	6.225***	-0.062									-0.022
	(2.453)	(0.122)									
(2)	-9.701	-0.020				3.618	3.255*	-0.536	0.450		-0.014
	(10.774)	(0.146)				(2.444)	(1.824)	(6.403)	(2.382)		
(3)	15.334***		**2.033*** **								0.027
	(4.818)		**(0.830)**								
(4)	3.596			-0.756							-0.015
	(3.111)			(0.958)							
(5)	5.900	0.091	**3.065*** **			1.415	4.285***	2.960	0.412		0.049
	(12.078)	(0.165)	**(0.708)**			(2.454)	(1.724)	(7.299)	(2.583)		
(6)	15.371	0.120	**3.123*** **		-43.760	6.622	5.293**	5.558	1.073		0.027
	(12.863)	(0.173)	**(0.692)**		(75.154)	(9.408)	(2.656)	(10.797)	(2.967)		
(7)	12.594**	0.120	**1.591* **							5.041**	0.233
	(4.767)	(0.161)	**(0.965)**							(2.009)	
(8)	31.193*	0.252	**2.419*** *		-77.800	8.724	1.539	7.654	-0.708	4.984*	0.175
	(17.590)	(0.188)	**(1.187)**		(70.168)	(8.744)	(3.229)	(10.846)	(3.441)	(2.558)	
(9)	5.921**			0.011						5.362***	0.226
	(2.470)			(0.945)						(1.940)	

Panel B. EXC_EW as Dependent Variable

Model	INTERCEPT	EXC_EW	AC_VW	AC_EW	BTM_EW	DP	TERM	DEF	SHORT	CAY	ADJ. R^2
(1)	10.406***	0.010									-0.026
	(3.979)	(0.120)									
(2)	-12.301	0.037				5.668	1.392	1.862	-1.671		-0.033
	(15.746)	(0.133)				(3.988)	(3.651)	(9.741)	(3.366)		
(3)	34.012***		**5.098*** **								0.124
	(7.176)		**(1.270)**								
(4)	10.911			0.331							-0.026
	(7.451)			(1.845)							
(5)	30.697**	0.281	**8.229*** **			-1.034	3.590	12.513	-1.769		0.217
	(14.329)	(0.195)	**(1.544)**			(3.797)	(3.034)	(10.771)	(3.169)		
(6)	39.131	0.269	**8.537*** **		-13.839	-0.267	3.947	14.077	-1.458		0.195
	(30.178)	(0.180)	**(1.988)**		(42.280)	(4.465)	(2.869)	(13.682)	(3.099)		
(7)	34.745***	0.266	**5.931*** **							5.330*	0.296
	(8.120)	(0.184)	**(1.717)**							(2.943)	
(8)	40.832	0.365**	**7.412*** **		0.351	-3.185	-1.971	11.937	-4.508	5.728*	0.305
	(28.999)	(0.171)	**(2.012)**		(39.306)	(4.232)	(4.079)	(12.797)	(3.601)	(3.153)	
(9)	14.012**			1.564						7.070**	0.173
	(6.659)			(1.870)						(3.426)	

Table 3. Normal Accruals versus Discretionary Accruals as Return Predictors

This table reports estimation results of regressing market returns against one-period-lagged normal accruals (NAC) versus discretionary accruals (DAC). The sample period is 1965-2004. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable	Intercept	NAC_VW	NAC_EW	DAC_VW	DAC_EW	Adj. R^2
A Value-Weighted Excess Market Returns						
(1) EXC_VW	5.350	-0.099				-0.027
	(5.842)	(1.352)				
(2) EXC_VW	11.038***			**7.573*****		0.179
	(2.016)			**(1.777)**		
(3) EXC_VW	7.205	-0.997		**7.817*****		0.164
	(5.983)	(1.337)		**(1.936)**		
(4) EXC_VW	3.447		-0.846			-0.014
	(3.368)		(1.015)			
(5) EXC_VW	5.544**				-1.665	-0.026
	(2.370)				(8.817)	
(6) EXC_VW	2.715		-1.360		5.468	-0.037
	(3.575)		(1.147)		(10.275)	
B Equal-weighted Excess Market Returns						
(1) EXC_EW	23.393**	3.342				0.011
	(11.225)	(2.576)				
(2) EXC_EW	17.886***			**11.332*****		0.179
	(3.890)			**(2.926)**		
(3) EXC_EW	25.961**	2.099		**10.819*****		0.171
	(11.306)	(2.615)		**(3.244)**		
(4) EXC_EW	11.393		0.524			-0.025
	(7.642)		(2.045)			
(5) EXC_EW	9.629**				-2.789	-0.026
	(4.373)				(12.018)	
(6) EXC_EW	12.857*		1.552		-10.925	-0.044
	(7.193)		(2.416)		(14.315)	

Table 4. Valued-weighted Discretionary Accruals as Return Predictors

This table reports estimation results of regressing market returns against various one-period-lagged predictors. The sample periods are 1965-2004 for models (1)-(4), and 1965-2002 for models (5)-(6), respectively. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Panel A. EXC_VW as Dependent Variable

Model	INTERCEPT	EXC_VW_{-1}	DAC_VW	BTM_VW	DP	TERM	DEF	SHORT	CAY	ADJ. R^2
(1)	11.038***		**7.573*** **							0.179
	(2.016)		**(1.777)**							
(2)	10.955***	0.025	**7.656*** **							0.157
	(2.111)	(0.129)	**(1.942)**							
(3)	5.047	0.039	**7.066*** **		2.116	1.990	-3.854	-0.573		0.109
	(12.374)	(0.158)	**(2.338)**		(2.325)	(2.103)	(7.314)	(2.670)		
(4)	42.497***	0.155	**9.797*** **	-149.90**	19.593**	4.818*	3.154	1.228		0.166
	(12.523)	(0.171)	**(2.047)**	(67.995)	(8.214)	(2.586)	(9.631)	(2.832)		
(5)	6.114***								5.302***	0.243
	(1.724)								(1.834)	
(6)	9.003***		**4.693** **						4.159**	0.298
	(2.151)		**(1.972)**						(1.802)	
(7)	55.396***	0.301*	**8.774*** **	-173.23***	20.953***	1.358	4.982	-0.626	4.402**	0.314
	(17.901)	(0.173)	**(2.682)**	(63.482)	(7.500)	(3.171)	(9.664)	(3.356)	(2.089)	

Panel B. EXC_EW as Dependent Variable

Model	INTERCEPT	EXC_EW_{-1}	DAC_VW	BTM_EW	DP	TERM	DEF	SHORT	CAY	ADJ. R^2
(1)	17.886***		**11.332*** **							0.179
	(3.890)		**(2.926)**							
(2)	17.167***	0.202	**13.264*** **							0.194
	(3.791)	(0.132)	**(3.344)**							
(3)	13.566	0.241	**13.293*** **		2.575	-1.709	-2.515	-3.949		0.144
	(18.133)	(0.192)	**(4.097)**		(3.519)	(5.150)	(11.308)	(4.507)		
(4)	19.889	0.233	**13.793** **	-10.794	3.257	-1.616	-1.800	-3.794		0.118
	(43.022)	(0.173)	**(5.527)**	(52.794)	(5.527)	(4.928)	(10.654)	(4.114)		
(5)	10.481***								6.602**	0.160
	(3.415)								(2.919)	
(6)	15.045***		**7.918*** **						4.756*	0.242
	(3.927)		**(2.701)**						(2.624)	
(7)	21.145	0.317*	**11.345** **	5.903	0.349	-7.439	-2.601	-6.975	5.921**	0.244
	(39.881)	(0.177)	**(5.307)**	(48.460)	(4.648)	(5.683)	(9.135)	(4.441)	(2.947)	

Table 5A. Robustness Analysis I: Different Definitions of Discretionary Accruals as Predictors of NYSE/AMEX Value-weighted Index Returns Measured Over Different Periods

This table reports estimation results of regressing NYSE/AMEX index (excess) returns against one-period-lagged value-weighted aggregate discretionary accruals for NYSE/AMEX firms. We measure market returns over the following periods: January-December, February-January (FJ), March-February (MF), April-March (AM), and May-April (MA). We use two methods, Sloan (1996) and Teoh, Welch, and Wong (1998a&b), to calculate each firm's accruals: ACC and ACC1, respectively. We then obtain two pairs of value-weighted aggregate discretionary accruals, (DAC_VW, DAC_VW1) and (DAC_TS_VW, DAC_TS_VW1), by applying the cross-sectional version and the time-series version of Jones' (1991) model to the two accruals, respectively. The sample periods are 1965-2004 for all models. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Dep. Var.	INTERCEPT	DAC_VW	DAC_TS_VW	DAC_VW1	DAC_TS1_VW	ADJ. R^2
EXC_VW	11.038***	**7.573*** **				0.179
	(2.016)	**(1.777)**				
	5.787**		**6.341*** **			0.089
	(2.292)		**(1.798)**			
	6.634***			**5.046*** **		0.069
	(2.373)			**(1.598)**		
	6.223***				**5.405*** **	0.074
	(2.261)				**(1.442)**	
EXC_VW_ FJ	10.055***	**6.532*** **				0.160
	(2.055)	**(1.778)**				
	5.324**		**6.702*** **			0.128
	(2.338)		**(1.621)**			
	6.262**			**5.903*** **		0.130
	(2.324)			**(1.032)**		
	5.782**				**6.249*** **	0.135
	(2.295)				**(1.142)**	
EXC_VW_ MF	9.248***	**5.448*** **				0.110
	(2.222)	**(1.839)**				
	5.307**		**5.534*** **			0.084
	(2.370)		**(1.602)**			
	6.086**			**4.929*** **		0.088
	(2.364)			**(1.182)**		
	5.685**				**5.327*** **	0.097
	(2.348)				**(1.240)**	
EXC_VW_ AM	9.504***	**5.417** **				0.082
	(2.419)	**(2.169)**				
	5.298**		**7.204*** **			0.122
	(2.574)		**(1.860)**			
	6.331**			**6.671*** **		0.140
	(2.584)			**(1.952)**		
	5.789**				**7.010*** **	0.143
	(2.562)				**(1.876)**	
EXC_VW_ MA	9.381***	**5.574*** **				0.108
	(2.310)	**(1.524)**				
	4.997**		**7.421*** **			0.159
	(2.548)		**(1.846)**			
	6.162**			**8.197*** **		0.270
	(2.566)			**(1.519)**		
	5.500**				**7.839*** **	0.223
	(2.540)				**(1.803)**	

Table 5B. Robustness Analysis II: Return Prediction Beyond the NYSE/AMEX Index

This table reports estimation results of regressing market excess returns against one-period-lagged value-weighted aggregate discretionary accruals for firms across stock exchanges. We measure market returns in a calendar year, i.e., January-December, for the NYSE/AMEX index (EXC_VW, EXC_EW) and the NYSE/AMEX/DASDAQ index (EXC_VW_ND, EXC_EW_ND). We use the Sloan's (1996) method to calculate each firm's accruals and then apply the cross-sectional version of Jones' (1991) model to obtain discretionary accruals for firms in the NYSE/MAEX index (DAC_VW, DAC_EW) and NYSE/AMEX/NASDAQ index (DAC_VW_ND, DAC_EW_ND), respectively. The sample periods are 1965-2004 for all models. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Dep. Var.	INTERCEPT	DAC_VW	DAC_VW_ND	DAC_EW	DAC _EW_ND	ADJ. R^2
EXC_VW	11.038***	**7.573*** **				0.179
	(2.016)	**(1.777)**				
	8.917***		**6.135*** **			0.151
	(2.191)		**(1.984)**			
	5.544**			-1.665		-0.026
	(2.370)			(8.817)		
	6.092**				1.424	-0.025
	(2.370)				(6.658)	
EXC_EW	17.886***	**11.332*** **				0.179
	(3.890)	**(2.926)**				
	15.309**		**9.646*** **			0.165
	(3.230)		**(2.580)**			
	9.629**			-2.789		-0.026
	(4.373)			(12.018)		
	10.248**				-1.637	-0.025
	(4.099)				(7.184)	
EXC_VW_ ND	11.086***	**7.657*** **				0.159
	(2.190)	**(1.837)**				
	8.984***		**6.290*** **			0.137
	(2.840)		**(2.343)**			
	5.523**			-1.755		-0.026
	(2.489)			(9.406)		
	6.120**				1.664	-0.025
	(2.477)				(7.386)	
EXC_EW_ ND	19.167***	**11.606*** **				0.149
	(4.600)	**(2.911)**				
	16.451***		**9.805*** **			0.135
	(3.760)		**(2.591)**			
	10.340**			-5.895		-0.023
	(4.786)			(12.756)		
	10.830**				-4.644	-0.021
	(4.512)				(8.117)	

Table 6. Pairwise Granger Causality Tests

This table reports results of pairwise Granger causality tests of measures of value-weighted accruals (AC_VW, DAC_VW) with measures of market returns in excess of one-month T-Bill rates (EXC_VW, EXC_EW). The sample period is 1965-2004.

	Null Hypothesis:	Obs	F-Statistic	P-Value
(A)	AC_VW does not Granger cause EXC_VW	39	1.863	0.181
	EXC_VW does not Granger cause AC_VW		0.084	0.774
(B)	AC_VW does not Granger cause EXC_EW	39	8.339	0.007
	EXC_EW does not Granger cause AC_VW		0.066	0.799
(C)	DAC_VW does not Granger cause EXC_VW	39	8.893	0.005
	EXC_VW does not Granger cause DAC_VW		0.302	0.586
(D)	DAC_VW does not Granger cause EXC_EW	39	11.129	0.002
	EXC_EW does not Granger cause DAC_VW		1.904	0.176

Table 7. Measures of (Aggregate) Accruals as Predictors of GDP Growth Rates
This table reports regressions results of predicting US annual GDP growth rates (GDPG) with various value-weighted aggregate accrual measures (AC_VW, NAC_VW, DAC_VW), industrial product growth rates (IPG), and aggregate market excess returns (EXC_VW, EXC_EW). The sample period is 1965-2004. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Model	INTERCEPT	IPG	EXC_VW	EXC_EW	AC_VW	NAC_VW	DAC_VW	ADJ. R^2
(1)	2.396***	0.276***						0.345
	(0.255)	(0.038)						
(2)	1.050	0.261***			**-0.287****			0.374
	(0.654)	(0.044)			**(0.141)**			
(3)	0.643	0.280***				**-0.423****		0.394
	(0.822)	(0.045)				**(0.199)**		
(4)	2.307***	0.257***					-0.155	0.306
	(0.323)	(0.032)					(0.246)	
(5)	0.643	0.279***				**-0.419***	-0.030	0.377
	(0.830)	(0.038)				**(0.222)**	(0.286)	
(6)	1.758**	0.210***	0.052***		-0.107			0.506
	(0.824)	(0.059)	(0.016)		(0.152)			
(7)	1.522	0.220***	0.050***			-0.179		0.511
	(0.972)	(0.060)	(0.015)			(0.218)		
(8)	2.235***	0.205***	0.057***				-0.019	0.497
	(0.348)	(0.051)	(0.014)				(0.199)	
(9)	1.785**	0.226***		0.045***	-0.078			0.508
	(0.882)	(0.044)		(0.009)	(0.171)			
(10)	1.271	0.237***		0.033***		-0.215		0.525
	(0.869)	(0.048)		(0.007)		(0.197)		
(11)	2.221***	0.231***		0.040***			0.203	0.513
	(0.357)	(0.035)		(0.008)			(0.215)	

Table 8. Actual versus Predicted Market Excess Returns

This table reports the actual versus predicted market returns in excess of one-month T-Bill rates. The forecasting equation is EXC_VW (EXC_EW) = a+b*DAC_VW, and the respective predicted values are labeled as EXC_VWF (EXC_EWF). The sample period is 1965-2004.

YEAR	EXC_VW	EXC_VWF	EXC_EW	EXC_EWF
1965	10.41330	---	31.60216	---
1966	-13.39413	-7.779604	-11.09315	-10.27281
1967	24.41902	13.52822	73.28214	21.61260
1968	8.875444	-11.25936	36.51356	-15.47998
1969	-17.42743	-23.10860	-32.01292	-33.21139
1970	-6.310297	-7.166238	-17.30136	-9.354956
1971	11.88173	7.868886	16.06058	13.14387
1972	13.44938	2.630719	1.696221	5.305382
1973	-24.55478	4.871900	-41.79540	8.659123
1974	-35.31053	6.225305	-34.60087	10.68438
1975	31.88783	18.79771	61.25870	29.49795
1976	21.35957	7.942915	44.19665	13.25464
1977	-9.302449	6.681089	10.19583	11.36643
1978	0.496362	6.268561	12.86539	10.74911
1979	12.89235	8.000532	29.12165	13.34086
1980	21.21227	12.25029	22.82068	19.70027
1981	-19.12850	9.548004	-10.31661	15.65653
1982	9.522770	11.23361	18.19772	18.17890
1983	14.21359	10.75398	27.75174	17.46117
1984	-4.873242	5.671315	-13.02207	9.855383
1985	23.48248	14.36887	19.05875	22.87056
1986	10.82235	12.61135	5.928846	20.24058
1987	-2.626995	2.611369	-10.98645	5.276426
1988	11.17713	13.43174	14.37474	21.46822
1989	21.15678	8.204985	7.843138	13.64681
1990	-12.49393	8.547292	-28.23563	14.15904
1991	25.07380	8.098473	34.22033	13.48742
1992	4.605588	3.548632	17.58115	6.678962
1993	8.091575	7.970697	20.14307	13.29622
1994	-4.177135	7.121009	-7.073817	12.02473
1995	29.28909	8.186580	18.71975	13.61927
1996	15.81567	5.479732	15.60369	9.568694
1997	27.01920	4.022632	19.13289	7.388264
1998	14.09150	4.934508	-8.864751	8.752811
1999	5.960029	6.511430	3.199863	11.11255
2000	-2.118496	6.913208	0.414216	11.71377
2001	-12.21222	6.569201	11.22794	11.19900
2002	-19.81061	-2.067340	-7.848794	-1.724876
2003	28.32621	8.161995	50.17359	13.58248
2004	12.75901	5.954383	20.35636	10.27897

Table 9. Contemporaneous Relations Between Innovations in Aggregate Accrual Measures, Aggregate Market Returns and Macroeconomy
This table reports the GMM estimation results on the system of equations: $y_t=\alpha+\beta\upsilon_t+\varepsilon_t$ and $F_t = \theta+\gamma F_{t-1} + \upsilon_t$, where the symbol F represents the set of variables such as the value-weighted aggregate accrual measures (AC_VW, NAC_VW, and DAC_VW), term premium (TERM), default premium (DEF), short-term interest rate (TB1M), and consumption-wealth ratio (CAY). In Panel A, the dependent variable y is value-weighted and equal-weighted market excess returns (EXC_VW, EXC_EW). In Panel B, y is the annual GDP growth rate (GDPG). The sample periods are 1965-2004 except for regressions including the variable CAY, which is 1965-2002. The GMM Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Contemporaneous Relations between Innovations in Aggregate Accrual Measures and Aggregate Market Returns

Model	INTERCEPT	υ_ACVW	υ_NACVW	υ_DACVW	υ_TERM	υ_DEF	υ_TB1M	υ_CAY	ADJ. R^2
	A.1) Dependent variable: Value-weighted excess market returns (EXC_VW)								
(1)	5.561**	**-3.593*** **							0.237
	(2.083)	**(0.901)**							
(2)	5.844***	**-2.483*** **			-2.790*	-10.537*	-2.258**	-3.736***	0.286
	(2.187)	**(0.889)**			(1.512)	(5.424)	(1.027)	(1.147)	
(3)	5.350		-0.099						-0.027
	(7.715)		(1.765)						
(4)	7.520		0.330		-2.034	-8.075	-3.201**	-5.804***	0.137
	(5.475)		(1.172)		(1.695)	(5.666)	(1.377)	(1.741)	
(5)	6.101***			**-8.763*** **					0.311
	(1.898)			**(1.973)**					
(6)	6.179***			**-4.490*** **	-2.339	-6.116	-2.687**	-4.175***	0.243
	(2.100)			**(1.468)**	(1.538)	(5.258)	(1.191)	(1.126)	
	A.2) Dependent variable: Equal-weighted excess market returns (EXC_EW)								
(1)	9.591***	**-7.307*** **							0.461
	(2.834)	**(0.976)**							
(2)	8.840***	**-7.045*** **			-1.735	-18.842**	-1.396	-0.975	0.411
	(2.904)	**(0.904)**			(2.254)	(7.373)	(1.531)	(2.319)	
(3)	23.393		3.342						0.011
	(16.095)		(3.575)						
(4)	33.263***		5.880**		1.006	-20.985**	-3.882*	-0.066	0.045
	(11.891)		(2.560)		(2.825)	(9.690)	(2.194)	(0.209)	
(5)	10.026***			**-16.285*** **					0.494
	(2.774)			**(2.472)**					
(6)	9.786***			**-13.571*** **	-0.505	-6.051	-2.514	-1.907	0.311
	(3.039)			**(2.214)**	(2.321)	(7.537)	(2.019)	(2.511)	

Panel B. Contemporaneous Relations between Innovations in Aggregate Accrual Measures and Macroeconomy

Model	INTERCEPT	IPG	υ_ACVW	υ_NACVW	υ_DACVW	υ_TERM	υ_DEF	υ_TB1M	υ_CAY	ADJ. R^2
(1)	3.185***		0.248							-0.033
	(0.312)		(0.180)							
(2)	3.251***		0.368**			0.066	-4.076***	0.482***	-0.371***	0.251
	(0.314)		(0.148)			(0.182)	(0.911)	(0.131)	(0.129)	
(3)	2.106***	0.371***	0.150			0.047	0.054	0.383***	-0.077	0.506
	(0.355)	(0.092)	(0.105)			(0.153)	(1.656)	(0.097)	(0.103)	
(4)	3.185***			**0.679*** **						0.090
	(0.305)			**(0.211)**						
(5)	3.251***			**0.661*** **		0.151	-3.655**	0.425***	-0.390***	0.287
	(0.309)			**(0.219)**		(0.188)	(0.850)	(0.120)	(0.125)	
(6)	2.146***	0.359***		**0.376*** **		0.112	0.131	0.340***	-0.129	0.537
	(0.349)	(0.087)		**(0.145)**		(0.161)	(1.530)	(0.090)	(0.103)	
(7)	3.184***				-0.002					-0.086
	(0.309)				(0.345)					
(8)	3.250***				0.510*	-0.049	-4.154***	0.556***	-0.297**	0.190
	(0.316)				(0.269)	(0.171)	(0.948)	(0.142)	(0.137)	
(9)	2.033***	0.394***			0.108	0.003	0.320	0.410***	-0.008	0.490
	(0.345)	(0.091)			(0.193)	(0.143)	(1.642)	(0.105)	(0.115)	

Table 10. Valued-weighted Discretionary Accruals versus Other Market-timing Variables as Return Predictors

This table reports the OLS estimation results of regressing market returns against various one-period-lagged predictors. The sample periods are 1965-2004 for models (1)-(3) and models (5)-(6), 1965-2002 for models (4) and (7), and 1965-1994 for models (8)-(10), respectively. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Panel A. EXC_VW as Dependent Variable

Model	Intercept	EXC_VW	DAC_VW	BTM_VW	DP	TERM	DEF	SHORT	CAY	S	SF2RAW	GHAT	ADJ. R^2
(1)	11.038***		**7.573*** **										0.179
	(2.06)		**(1.777)**										
(2)	16.839***									-0.579*			0.068
	(6.225)									(0.322)			
(3)	22.268***		**7.617*** **							-0.593**			0.259
	(5.550)		**(2.203)**							(0.287)			
(4)	47.738**	0.257	**7.601** **	-145.03**	19.086**	1.420	5.823	-0.499	3.626*	-0.400			0.323
	(18.131)	(0.173)	**(2.922)**	(60.712)	(7.649)	(3.244)	(9.334)	(3.475)	(1.890)	(0.287)			
(5)	5.993***										-2.748		0.002
	(2.190)										(2.184)		
(6)	10.960***		**7.366*** **								-0.819		0.159
	(2.090)		**(1.936)**								(1.889)		
(7)	61.802***	0.347**	**10.025*** **	-198.82**	24.873***	1.665	3.666	-0.413	4.319**		2.292		0.305
	(21.211)	(0.174)	**(2.992)**	(74.445)	(8.480)	(3.133)	(10.246)	(3.419)	(1.968)		(1.791)		
(8)	10.937***											-1.493***	0.179
	(1.971)											(0.419)	
(9)	12.890***		**5.351*** **									-1.147***	0.285
	(2.065)		**(1.461)**									(0.404)	
(10)	25.307***	0.382**	**4.068** **	-221.37***	37.627***	6.304*	1.858	1.116	3.243**			-1.111**	0.540
	(5.845)	(0.182)	**(1.996)**	(44.943)	(7.887)	(3.755)	(7.826)	(2.786)	(1.598)			(0.438)	

Panel B. EXC_EW as Dependent Variable

Model	Intercept	EXC_EW	DAC_VW	BTM_EW	DP	TERM	DEF	SHORT	CAY	S	SF2RAW	GHAT	ADJ. R^2
(1)	17.886***		**11.332*** **										0.179
	(3.890)		**(2.926)**										
(2)	26.727***									-0.855*			0.064
	(10.049)									(0.518)			
(3)	34.785***		**11.399*** **							-0.892*			0.259
	(10.864)		**(3.091)**							(0.466)			
(4)	14.240	0.260**	**8.808* **	12.022	3.784	-5.807	2.097	-5.823	4.040*	-0.959**			0.311
	(40.710)	(0.117)	**(5.425)**	(47.098)	(5.061)	(5.177)	(8.478)	(4.056)	(2.072)	(0.439)			
(5)	10.938***										-9.120***		0.109
	(3.208)										(2.950)		
(6)	17.288***		**9.746*** **								-6.278**		0.216
	(3.289)		**(3.215)**								(2.571)		
(7)	42.349	0.184	**10.082** **	-38.558	1.373	-5.570	7.747	-5.654	5.328*		-7.549*		0.276
	(40.114)	(0.168)	**(4.973)**	(59.281)	(4.905)	(5.490)	(11.358)	(4.401)	(2.990)		(4.425)		
(8)	22.464***											-2.910***	0.262
	(5.436)											(0.719)	
(9)	24.842***		**7.287*** **									-2.513***	0.353
	(5.319)		**(2.028)**									(0.695)	
(10)	35.809	0.382**	7.805	-35.401	10.287*	0.383	-16.551*	-2.464	6.204***			-3.274***	0.529
	(62.650)	(0.167)	(8.456)	(45.626)	(5.552)	(7.314)	(9.977)	(5.021)	(2.214)			(0.944)	

Table 11. Discretionary Accruals as Return Predictors: Grouped by Firms' Market Size
This table reports estimation results of regressing market excess returns against one-period-lagged aggregate discretionary accruals of different groups of firms. Firms are classified into three groups, small (S), medium (M), and large (L), based on their market capitalizations at the beginning of each year. The sample periods are 1965-2004 for all models. The Newey-West HAC standard errors are reported in parentheses. *, **, and *** denote (two-sided) significance at the 10%, 5%, and 1% levels, respectively.

Panel A. EXC_VW as Dependent Variable

Model	INTERCEPT	DAC_VW	DAC_VW_S	DAC_VW_M	DAC_VW_L	DAC_EW_S	DAC_EW_M	DAC_EW_L	ADJ. R^2
(1)	11.038***	**7.573*** **							0.179
	(2.016)	**(1.777)**							
(2)	5.743***		0.852						-0.026
	(2.143)		(2.968)						
(3)	5.781***			-0.911					-0.026
	(2.031)			(5.192)					
(4)	11.152***				**7.332*** **				0.182
	(1.969)				**(1.706)**				
(5)	5.412**					-2.982			-0.020
	(2.034)					(4.995)			
(6)	6.159***						-3.765		-0.002
	(1.925)						(2.764)		
(7)	7.361**							4.424*	0.004
	(2.755)							(2.638)	

Panel B. EXC_EW as Dependent Variable

Model	INTERCEPT	DAC_VW	DAC_VW_S	DAC_VW_M	DAC_VW_L	DAC_EW_S	DAC_EW_M	DAC_EW_L	ADJ. R^2
(1)	17.886***	**11.332*** **							0.179
	(3.890)	**(2.926)**							
(2)	9.986***		-3.285						-0.019
	(3.241)		(4.382)						
(3)	9.738***			6.286					-0.005
	(3.269)			(10.142)					
(4)	18.040***				**10.950*** **				0.181
	(3.915)				**(2.832)**				
(5)	8.443**					**-13.563** **			0.042
	(3.234)					**(6.273)**			
(6)	9.933***						0.326		-0.027
	(3.084)						(5.218)		
(7)	11.533**							4.288	-0.014
	(4.258)							(4.736)	

Table 12. Return-(Discretionary) Accrual Relations: Macro and Micro

For each firm, we run a predictive regression of firm returns against one-year-lagged firm-level discretionary accruals and/or one-year-lagged value-weighted aggregate discretionary accruals in the 1965-2004 period. We require a firm to have at least ten observations of data over the sample period. We report the cross-sectional means, t-values of the cross-sectional means, and cross-sectional medians of the firm-level predictive regression results in the first, second, and third row of each cell of this table, respectively. Panel A and Panel B correspond to firm-level annual returns measured over a calendar year and a twelve-month period from April of each year through March of next year, respectively.

Panel A. Annual Returns Measured Over Calendar Years

Model	Intercept	DAC	DAC_VW	ADJ. R^2
(1)	17.551***	-0.514***		0.007
	(51.148)	(-4.659)		(2.324)
	16.637	-0.393		-0.022
(2)	28.053***		17.804***	0.059
	(37.428)		(20.405)	(14.718)
	25.001		16.548	0.006
(3)	28.239***	-0.512***	18.215***	0.068
	(34.461)	(-4.521)	(19.530)	(13.510)
	25.523	-0.471	17.044	0.033

Panel B. Annual Returns Measured Over April-March

Model	Intercept	DAC	DAC_VW	ADJ. R^2
(1)	15.543***	-0.480***		0.004
	(48.556)	(-5.609)		(1.383)
	15.294	-0.410		-0.026
(2)	27.783***		19.519***	0.056
	(41.863)		(26.109)	(14.469)
	24.714		16.804	0.017
(3)	27.585***	-0.513***	19.792***	0.060
	(37.832)	(-5.790)	(24.186)	(12.360)
	24.416	-0.400	16.819	0.026

Figure 1. Aggregate Accruals (AC_VW), Aggregate Normal Accruals (NAC_VW), and Aggregate Discretionary Accruals (DAC_VW)

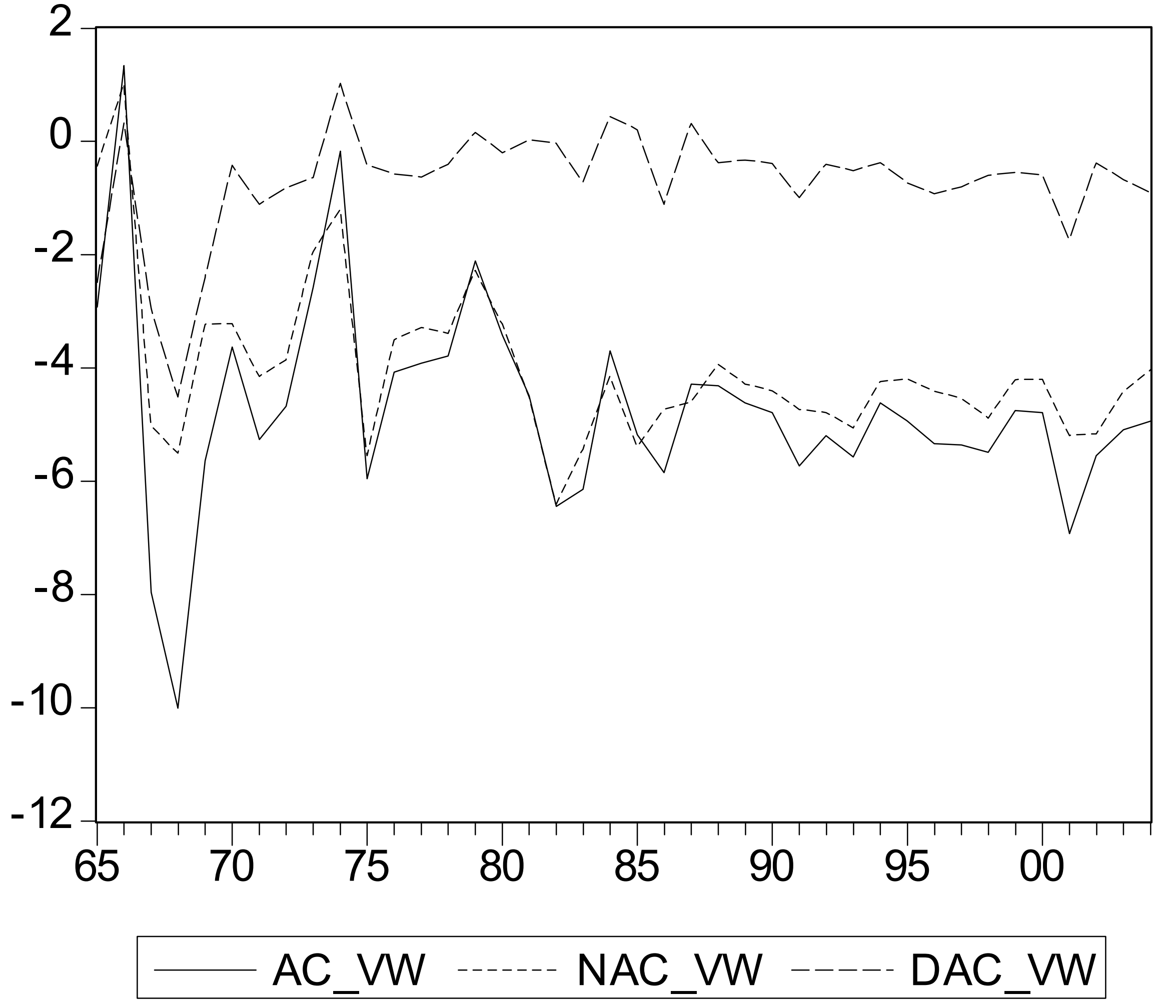


Figure 2. Monte-Carlo Analysis Under the Null Hypothesis of No Stock Return Predictability

We plot the histogram of estimated coefficients from regressing value-weighted excess market returns on value-weighted aggregate discretionary accruals. Following Baker, Taliaferro and Wurgler (2005), we first simulate 50,000 series of EXC_VW based on the following system of equations:

$EXC\_VW_t = a + u_t,$ with $u_t \sim i.i.d.(0, \sigma_u^2)$, and

$DAC\_VW_t = c + d^* DAC\_VW_{t-1} + v_t,$ with $v_t \sim i.i.d.(0, \sigma_v^2)$ and $\rho(u, v) \neq 0$.

Here, EXC_VW is the value-weighted excess market return; DAC_VW is the value-weighted aggregate discretionary accruals; the parameters a and σ_u are set based on the empirical distribution of EXC_VW; the parameters c, d, and σ_v are determined based on the empirical dynamics of DAC_VW; the correlation coefficient $\rho(u, v)$ is set to the its empirical value; the sample size is T. Specifically, a=5.864, σ_u=16.550; c=-0.461, d=0.345, σ_v=0.919; $\rho(u, v)$=-0.198; and T=40. We then regress each series of simulated returns against DAC_VW, and we use OLS estimates of the predictive coefficient b from 50,000 separate samples, reporting the average estimated coefficient and compare it with the actual estimation result.

Panel A. Average Estimated Predictive Coefficient from Simulations and Actual Result

Simulation versus Actual Results			
Average b	**Actual b**	Average/Actual	P_value
0.138	**7.573**	1.822%	<0.0001

Panel B. Histogram of Estimated Predictive Coefficients

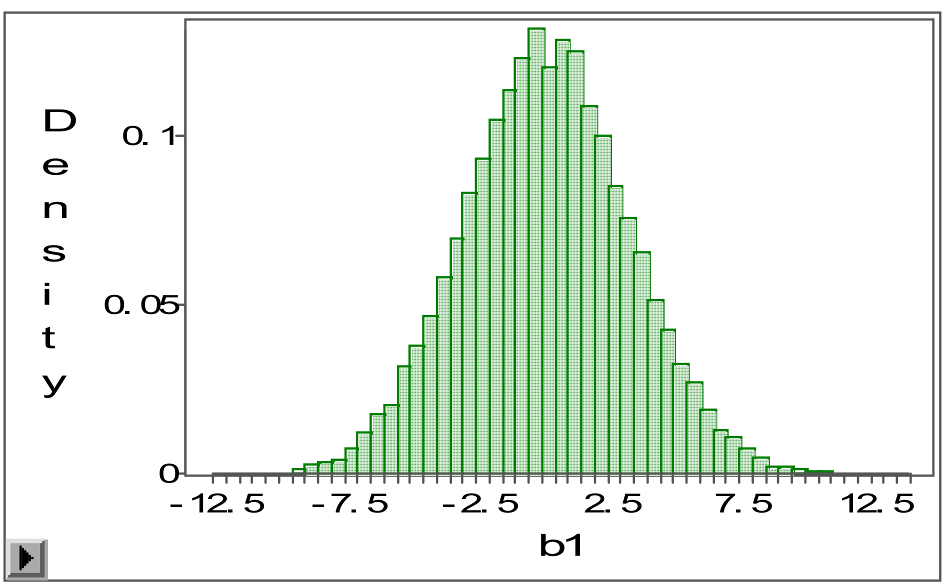
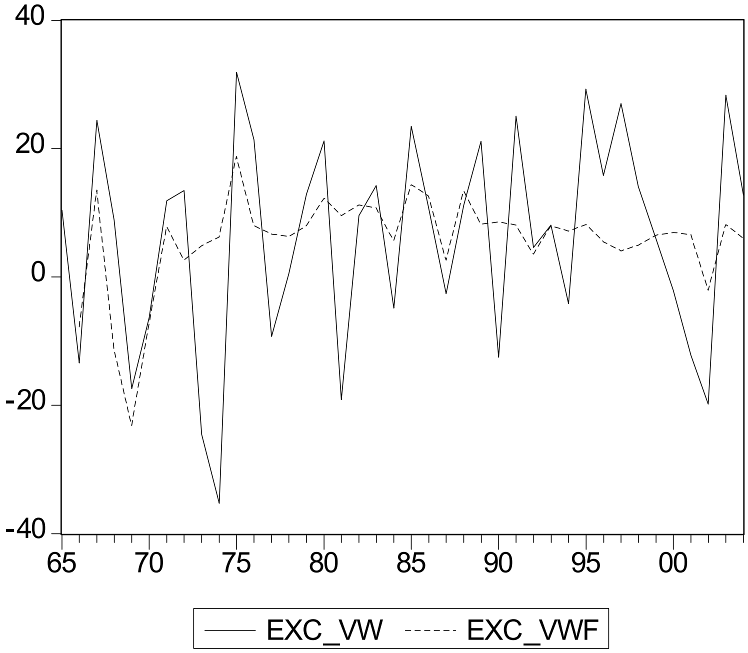


Figure 3. Actual versus Predicted Market Excess Returns
The forecasting equation is EXC_VW (EXC_EW) = a+b*DAC_VW, and the respective predicted values are labeled as EXC_VWF (EXC_EWF). The sample period is 1965-2004.

Value-weighted Market Excess Returns



Equal-weighted Market Excess Returns